Third Edition

NATIONAL GUIDELINES for MANAGEMENT of SEXUALLY TRANSMITTED INFECTIONS

National AIDS/STD Control
Directorate General of Health Services
Ministry of Health and Family Welfare
Government of the People's Republic of Bangladesh

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FOREWORD

Bangladesh has well demonstrated its commitment and capacity in keeping the HIV prevalence low in the region, still the prevalence remaining less than 0.01% since the 1st diagnosed cases in 1989. Government, UN agencies, Civil society organization and the private sector contributed a lots to reach the goal of the HIV programme in the country, but yet to address another important health problem such as "Sexually Transmitted Infection" (STI). STIs is one of the primordial disease of the sub-continent even in the world history, lots of myth, stigma associated with this disease. The global burden of STIs remains high. More than 1 million STIs are acquired every day worldwide. In 2012, there were an estimated 357.4 million of new infections of curable STIs.

The burden of morbidity and mortality worldwide resulting from sexually transmitted pathogens compromises quality of life through deleterious effects on sexual and reproductive health, newborn and child health. STIs are a major cause of acute illness, infertility, long term disability and death, with severe medical and psychological consequences for men, women and infants. Considering these, National AIDS/ STD Programme (NASP) under Directorate General of Health Services (DGHS) taken various initiatives to prevent and medical management in collaboration with different stakeholders of the health system. Building capacity of the health services providers at different level and better management, guideline and treatment protocol play an important role. Based on this rationale, NASP, DGHS updated the STIs management guideline following updated management protocol of WHO and others standard documents of the world.

I hope, government, non-government and private sector health service providers will be benefited using this guideline in providing quality treatment and management of STIs. I acknowledge and thanks all the experts who were engaged in the updating process of the guideline.

Government of Bangladesh committed to achieve the STIs related world strategy which contribute to achieve SDGs specific goal "ending STIs epidemics as a major public health concerns by 2030".

Zahid Maleque, MP
Minister, Ministry of Health and Family Welfare
The People's Republic of Bangladesh

FOREWORD

Globally, sexually transmitted infections (STIs) are the major causes of acute illness, infertility, long-term disability and death, with severe adverse health related consequences for millions of populations. The burden of STIs and Human Immunodeficiency Virus (HIV) pose unprecedented challenges on the health system worldwide. As in other developing countries, STIs and reproductive tract infections (RTIs) represent a major public health problem in Bangladesh. Though Bangladesh is still has low prevalence of HIV infection among general population, high rate HIV prevalence in some key population pushed it towards the category of concentrated epidemic of HIV. As STIs and HIV walk together, Bangladesh needs to achieve preparedness based on maximum interventions to handle threat of STI and HIV burden to a manageable size.

To facilitate the availability and for reaching standardized STI/RTI care at all the levels of health facilities national guidelines is an important instrument. I am very happy to learn that the guidelines for National Guidelines for Management of STIs is going to be published soon. I hope this guideline will strengthen STI service delivery not only to the general population of Bangladesh but also to high risk groups, by expanding the provision of quality standardized STI/RTI services across the country at all levels of public health care system. I strongly recommend these guidelines for intensive use for managing STIs and as a reference for health care personnel working in public as well as private sectors. I genuinely acknowledge and appreciate the support and contribution of the National AIDS/STD Programme (ASP) for finalizing the National guidelines for management of STIs. I would like to express my sincere thanks to the authority of ASP and experts of core-group for technical support for preparation of this document.

Finally, given the enormity of the STI/RTI control and prevention activities, the Government of Bangladesh through the Ministry of Health and Family Welfare would like to appeal to more stakeholders to provide assistance in order to sustain the fight against STIs/RTIs that still remain a neglected disease burden area among the Bangladeshi population.

Md. Ashadul Islam
Secretary
Health Service Division
Ministry of Health and Family Welfare
Bangladesh

MESSAGE

The burden of morbidity and mortality worldwide resulting from sexually transmitted pathogens compromises quality of life through deleterious effects on sexual and reproductive health, newborn and child health. The World Health Organization (WHO) estimates that more than 1 million STIs are acquired every day worldwide. STIs represent a group of more than 30 diseases of different etiologies Individuals with STI/RTI have a significantly higher chance of acquiring and transmitting HIV. Controlling STI/RTI helps reduction HIV infection rates and provides a window of opportunity for counseling about HIV prevention and reproductive health and hygiene.

It is a great pleasure and satisfaction for me to see that the 3rd edition of National Guidelines for Management of Sexually Transmitted Infections is going to be published. I appreciate that after a long break AIDS/STD Program (ASP) undertook a fresh attempt to publish the 3rd edition of STI guidelines. My observation with regard to any kinds of guidelines is that it needs long time to work by a dedicated and competent team to produce a comprehensive document arranged and presented in well-organized format that provides adequate and reliable health information and direction for the country.

The highlights of the document including detailed history taking and clinical examination, comprehensive STI case management, etiologic agent and approach of management, partner management and management of pregnant women; effective drug regimens, single oral dosages wherever possible; issues of privacy and confidentiality are given special focus. The guidelines also emphasize on counseling for safe sex, condom promotion, dual protection options. Special population segments like neonates, adolescents and high-risk groups are addressed separately. I expect that these guidelines will be instrumental for all professionals of the government and NGOs involved in the National AIDS/STD Programme of Bangladesh.

I express my sincere thanks and gratefulness on behalf of my directorate for the experts, partners and stakeholders those who contributed their time and efforts for developing these guidelines. I appreciate the sincere effort of the Line Director of ASP and his team for their relentless effort to turn their office a vibrant and active one. I like to thank sponsoring United Nations Population Fund (UNFPA), Bangladesh for their support and for walking together with us in moving through a positive path of building capacity of our health system.

I trust that these Guidelines will serve its aim.

Professor Dr. Abul Kalam Azad
Director General
Directorate General of Health Services

MESSAGE

Sexually transmitted infections (STIs) are a major global cause of acute illness, infertility, long term disability and death, with severe medical and psychological consequences for millions of men, women and infants. Sexually transmitted infections increase risk of sexual transmission of HIV by two to three folds and failure to diagnose STI at an early stage may result in serious complications and sequelae, including infertility, foetal wastage, ectopic pregnancy, anogenital cancer and premature death, as well as neonatal and infant infections. Therefore, the individual and national expenditure for STI care can be substantial.

Effective management of STI is one of the cornerstones of STI control, as it prevents the development of complications and sequelae, decreases the spread of these diseases in the community and offers a unique opportunity for targeted education about HIV prevention. Appropriate treatment of STI patients at their first encounter with a health care provider is, therefore, an important public health measure. When this involves adolescent patients, there is the potential to influence future sexual behavior and treatment seeking practices at a critical stage of development. The use of appropriate standardized protocols is strongly recommended in order to ensure adequate treatment at all levels of the health service. These guidelines are intended as a resource document for physicians and other health personnel and service providers working at different levels of public health care system to ensure effective case management services for STI/RTI. I have been informed that this edition of the guideline is developed based on the newer version of WHO and CDC guideline and was made effort to cover more up to date information. I am very much grateful to our Director General of Health Services, for his continued support and encouragement.

We hope this 'Guideline' surely will serve attaining the country's SDG-3; ensuring healthy lives and promoting the well-being for all at all ages. AIDS/STD Program(ASP)and United Nations Population Fund (UNFPA), Bangladesh local office conducted series of meetings, group discussions and draft presentation in front of a group of Physicians, Dermatologists & Venereologists, Microbiologists, Gynecologists and public health specialists for updating this edition of national guideline. We are thankful to the UNFPA, Bangladesh for its continuous support, advice and technical guidance.

I wish to express my profound gratitude to all those who have tirelessly worked on this document.

Professor Dr. Md. Shamiul Islam
Director (MBDC) and Line Director, TB – Leprosy and ASP
Directorate General of Health Services

MESSAGE

Sexually transmitted infections, including HIV and AIDS, remains a leading cause of death among women of reproductive age and young adolescents, across the world. Stigma and discrimination continue to impede the realization of people's rights, including access to essential information and services for prevention and treatment of such infections.

With the ongoing pandemic and changes in the demographic landscape in Bangladesh, STIs are becoming a looming problem. This situation underscores the urgent need to ensure prevention and treatment of sexually transmitted infections and other reproductive tract infections are given greater importance in reproductive health policies and programmes.

This is especially important in order to achieve the global goal of *zero new infections, zero STI-related complications and deaths,* and *zero discrimination,* where everyone has free and easy access to prevention and treatment services for STIs.

As the UN's sexual and reproductive health agency, the United Nations Population Fund (UNFPA) has been supporting the Government of Bangladesh since 1974, providing technical and advisory services and support in the areas of sexual and reproductive health & rights and gender equality. In continuation to our support, UNFPA is happy to have provided technical assistance to the third edition of the National Guideline for Management of Sexually Transmitted Infections (STIs), which will reach all the physicians including primary health care providers and those involved in the treatment of STIs across Bangladesh.

While various programmes are implemented within integrated and comprehensive reproductive health programmes, STIs continues to be a severe health problem, particularly among women. A major barrier to STI control and prevention is the unavailability of reliable, low-cost, point-of-care tests, which allow diagnosis and treatment in a single visit. This guideline emphasizes the need of point-of-care test and treatment, which can be easily used by health workers, as well as other interventions that focus on key populations, and enhance capacity of service providers.

We express our sincere appreciation to the Ministry of Health and Family Welfare for the leadership and development of the National Guideline for Management of STIs. We are hopeful that this publication will be useful to policy makers, programme managers, and health care providers of formal and informal settings, including the public and private sectors.

On behalf of UNFPA, I am pleased to assure our continued support to the Government of Bangladesh in strengthening its health system to enhance the treatment and prevention of STIs among key populations, and in our shared journey towards eliminating STIs in Bangladesh.

Dr Asa Torkelsson
UNFPA Representative Bangladesh

GLOSSARY

Action Box	The rectangular box in the flow chart that an action is necessary, for example: take history, treat or educate.
Acyclovir	A nucleoside analog antiviral drug, primarily used for the treatment of viral infections.
Anaerobic bacteria	Bacteria that does not require oxygen for growth.
Aspirate	To remove (a fluid) from a body cavity by use of an aspirator or suction syringe, e.g. draw pus out of an inguinal bubo.
Asymptomatic	If a patient is a carrier for a disease or infection but experiences no symptoms.
Bacteria	A microscopic organism composed of a single cell. They constitute a large domain of prokaryotic microorganisms. Many bacteria may cause disease in humans.
Candida	Yeast like fungi commonly found in the normal flora of mouth, skin, intestinal tract and vagina but that can became clinically infectious in immune compromised people.
Candidiasis	An infection caused by a fungus of a Candida family generally Candida albicans.
Cervicitis	Cervicitis is an inflammation of the cervix, the lower, narrow end of the uterus that opens into the vagina.
Cervix	The cervix is the lower, narrow part of the uterus (womb). The uterus, a hollow, pear-shaped organ, is located in a woman's lower abdomen, between the bladder and the rectum.
Chancroid	Chancroid is a bacterial infection that causes open sores on or around the genitals of men and women.
Chlamydia	Chlamydia is a sexually transmitted infection (STI) caused by a bacteria called Chlamydia trachomatis.
Clinical	Pertaining to direct observation of the patient as distinguished from theoretical or basic science.
Complications	Secondary diseases or conditions that arise if a disease is not treated.
Condyloma	Condyloma is the medical term for genital warts. Genital warts are soft, noncancerous growths that can form on the skin on the outside or inside of your vagina or anus, or inside the cervix.
Decision box	The box on a flow chart that indicates you should obtain information or make a decision.
Diagnosis	Determination of the presence of a specific disease or infection usually accomplished by evaluating clinical symptoms and or laboratory tests.
Dyspareunia	Pain in the genital area or within the pelvis during sexual intercourse.

Dysuria	Painful or difficult urination.
Eficacy	The measure of how effective a treatment is.
Endometritis	Inflammation of the endometrium.
Endemic	An infection is constantly maintained at a baseline level in a geographic area without external inputs
Epidemic	An epidemic is the rapid spread of disease to a large number of people in a given population within a short period of time.
Epidemiology	The branch of medical science that deals with the incidence distribution and control of disease in a population.
Epithelium	The covering of the internal and external organs of the body and also the lining of vessels, body cavities and glands.
Edema/oedema	Accumulation of an excessive amount of watery fluid in cells, tissues or serous cavities.
Erythema	Redness or inflammation of the skin or mucous membrane.
Etiology/aetiology	The study or the theory of the factors that cause disease.
Fibrous scarring	Scarring that looks like or consists of fibres.
Fluctuant/ Fluctuation	Description of fluid that moves from one point or condition.
Friable	Bleeding on gentle touch.
Fungus	A class of microbes including mushroom, yeast, or moulds. As many as 150 of these organisms have now been linked to animal or human diseases.
Gonococcal	Caused by Gonorrhoea, as in Gonococcal urethritis.
Gonorrhoea	STI caused by bacterium Neisseria Gonorrhoea.
Guarding	During examination if the abdominal muscles become rigid and do not allow application of pressure, this resistance is known as guarding. It is usually a sign of peritonitis or an intraabdominal abscess, both potentially serious conditions.
Gynaecological	Concerning the physiological functions and diseases of the female reproductive system.
Hepatitis	An inflammation of the liver caused by certain viruses and other factors such as alcohol abuse, some medications and trauma.
Herpes	STI caused by Herpes Simplex virus (HSV).
Herpes Simplex virus	A virus that causes cold sores or fever blisters on the mouth or around the eyes and can be transmitted to the genital region.
Hydrocele	Collection of serous fluid in the tunica vaginalis testes.

Idiopathic	Without a known cause.
Immunodeficiency	A deficiency of the immune response or a disorder characterized by deficient immune response; classified as antibody (B cell) cellular (T cell) combined deficiency or phagocytic dysfunction disorders.
Incidence	The number of new cases occurring in a given population over a certain period of time.
Incubation period	The time interval between an initial exposure to infection and the appearance of the first symptom or sign of disease.
Infection	The state or condition in which the body or part of the body is invaded by an infectious agent (e.g. bacteria, fungus) which multiplies and produces an injurious effect (active infection).
Infectious	Capable of being transmitted by infection or without actual contact.
Inguinal bubo	A syndrome where a patient complains of a painful swelling of the lymph nodes in the groin; usually caused by LGV.
Hernia	A ruptured muscle wall in the groin through which internal organs or intestine may be partially displaced.
Intravaginally	Into or within the vagina.
Lactation	Another term for breast-feeding.
Lesion	A general term to describe an area of altered tissue (the infected path or sore in a skin)
Lower abdominal pain	The name of the syndrome where women complain of pain in the lower abdomen usually but not always caused by pelvic inflammatory diseases (PID).
Palpate/Palpation	To examine by touch.
Papilloma	I) A benign tumor (such as a wart or Condyloma) resulting from an overgrowth of tissue on papillae of vascularized connective tissue. 2) An epithelial tumor caused by a virus.
Parasite	A plant or animal that lives and feeds on or within another living organism does not necessarily cause disease.
Pathogen	A pathogen or infectious agent is a biological agent that causes disease or illness to its host.
Peritonitis	Inflammation of the peritoneum.
Physiological	Healthy/normal functioning of the bodily systems.
Prevalence	A measure of the proportion of people in a population affected with a particular disease at a given time.
Prophylaxis	Treatment that helps to prevent a disease or condition before it occurs or recurs.

Protocol	A system of rules that explain the correct conduct and procedures to be followed in formal situations.
Purulent	Discharging pus.
Qualified practitioner	Refers to hospital, private clinic, private doctor, NGO clinic and homeopathy
Salpingitis	Inflammation of the fallopian tubes.
Reproductive Tract Infections(RTIs)	RTIs are a diverse group of infections that affect organs of reproducing tract. They may be STIs or endogenous infections or iatrogenic infections.
Scrotal Swelling	Any number of tests that are performed on the clear portion of the blood. Often refers to a test that determines the presence of antibodies to antigens from bacteria or viruses.
Serologic Test	A test looks for the presence of antibodies, which are specific proteins made in response to infections.
Serum	The clear thin and sticky fluid portion of the blood that remains after coagulation. Serum contains no blood cells platelets or fibrinogen.
Sexually transmitted infections (STIs)	STIs are a diverse group of infections that are transmitted exclusively or primarily by sexual or intimate personal contact.
Sign	A clinical problem you can see by examination together with (symptoms) making a syndrome.
Surveillance	Close or continuous observation or testing used among community members, as in epidemiology.
Susceptible	Vulnerable or predisposed to a disease.
Symptomatic	Showing characteristic symptoms.
Symptoms	Any perceptible, subjective change in the body or its function that indicates disuse or phases of disease, as reported by the patient/client.
Un-qualified practitioner:	Refers to drug seller, canvasser/traditional healer, advice/treatment from friends and self-medication.

Section -1
Introduction

1.1 Background

The first national guideline "A technical standard and service delivery protocol for management of RTI and STD" was developed by the family planning, STD/RTI and HIV/AIDS task force under national integrated population & health program (NIPHP) and was approved by the ministry of health & family welfare in 1999. It was developed nationally through a consultative process involving all major stakeholders.

A thoroughly revised second version of the National Guidelines on Sexually Transmitted Infections (STIs) was published in 2006. It focused on antibiotic resistance particularly Ciprofloxacin in STI syndromic management, minimization of over-treatment in the general population and under treatment in the high-risk groups. It incorporated latest information as evident in the updated World Health organization (WHO) guideline in 2003.

Long time has been elapsed after publication of second guideline. Meanwhile WHO has released Sexually Transmitted Infections (STI) Strategy 2016-2021, STI Implementation Strategy 2017 and separate guidelines on Gonorrhoea, Chlamydia and Syphilis Management in 2016. Also, new epidemiological evidences have been generated at national level through national sentinel surveillances, study on selected STI prevalences among key populations and antimicrobial resistance. Hence, it is necessary to update the National Guideline aligning with national STI epidemiology and updated international guidance.

1.2 Rationale for having country-specific guidelines

STIs represent a group of more than 30 diseases of different etiologies. The disease burden of different STIs, risk behavior and stigma associated with STIs are different in different geographic regions. These discrepancies indicate the importance of having defined guidelines for management of STIs for each country. There are several international guidelines developed by experts in the field of STIs. However, it is essential that each country adopt their guidelines based on local conditions.

Country specific guidelines should consider the following issues:

- **Disease burden and disease pattern in different parts of the world**: The diseases burden of STIs differs in various parts of the world (WHO 2016). STIs are more common in developing countries compared to developed countries. Some STIs such as chancroid and genital ulcer diseases are more common in Africa.
- **Social and cultural stigma**: Stigma associated with STIs varies among different regions of the world. Risk assessment criteria are different based on social and cultural norms.

- **Targeted and generalized intervention**: STI intervention programs in other countries may vary based on the status of HIV epidemics. Targeted STI intervention may be more appropriate in low prevalent countries while generalized STI interventions may be critical in countries with generalized HIV epidemics.
- **Availability of drugs in different regions of the world**: The availability of approved drugs for STI management varies in different parts of the world.
- **Drug resistance**: Resistance to antimicrobial agents used for management of STIs varies geographically; hence specific guidelines are essential for each country.

1.3 Aims of the guidelines

The third edition of the guidelines aims to address issues identified through evidence-based research in Bangladesh.

- **Ending sexually transmitted infection epidemics by 2030:** Inclusion of effective interventions and services in alignment with global targets so that the goal of ending STIs epidemics as public health concerns by 2030 is achieved.
- **Guidelines for women with risk behavior**: This guideline will maintain separate management strategy/flow chart for women with high-risk behavior and females from general population since the prevalence of STIs is different in these two groups.
- **Prevent over treatment for cervicitis among females from general population**: Updated guidelines will continue focus to reduce over treatment of cervicitis among female from the general population since prevalence of cervicitis due to STIs is low in these women.
- **Ensure optimal treatment of cervicitis and syphilis among women with high-risk behavior**: The prevalence of cervicitis due to STIs is higher among women with high-risk behavior but most of the infections are asymptomatic. For females with high-risk behavior the revised guidelines will continue to adhere management strategy based on risk behavior, rather than only symptoms.
- **Appropriate drugs for treatmen**t: Based on the antimicrobial susceptibility data, this guideline aims to recommend the most effective drugs.
- **Non-compliance of treatment**: In order to avoid non-compliance, this guideline emphasizes the use of single dose drugs whenever possible and a directly observed therapy.
- **Treatment of subjects based on risk of acquisition of infection and not symptoms**: The current guideline flowchart is designed to address the issue of acquisition of infection based on risk behavior, irrespective of symptoms.

1.4 Process for development of guideline

The AIDS/STD Program (ASP), Directorate General of Health Services has developed the current guidelines using the following process.

- **Formation ofcore technical and advisory committee**: At the beginning, national core committee and advisory committee (experts on STI) were formed. The core group consists of representatives of ASP, DG, Health and FP, research organizations program implementers, donors, HIV & STI program management agencies and relevant NGOs

- **Evaluation of the current guidelines**: The technical committee evaluated the existing guidelines/reports/strategy in detail and identified the limitations and scopes for improvement of the present guidelines (Report on Global Sexually Transmitted Infections Surveillance -2015, WHO Global Health Sector Strategy on Sexually Transmitted Infections, 2016-2021- June 2016, Behavioural and Serological Surveillance amongst Key Populations at Risk of HIV in Selected Areas of Bangladesh, 2016 etc.). Available research data including STI prevalence data, syndromic management evaluation data (Validity Assessment of Flowcharts for SyndromicManagement of Vaginal Discharge. icddr,b, 2003 and RCT on Modified Syndromic Approach for RTI/STI Management at UPHC centers, OGSB& ICMH, 2003) and antimicrobial susceptibility data were extensively reviewed.
- **Scope of improvement of current guidelines:** The editorial group identified the scope of improvement of current guidelines.
- **Review WHO, CDC and other regional guidelines:** Available international guidelines for STI management were reviewed and necessary changes were made.
- **Draft formulation of the guideline:** Based on the suggestions of the editorial group, experts revised the guidelines. All members of core group including ASP, were involved in the revision process.
- **Circulation of the draft guideline to national and international experts:** The draft guidelines were circulated for extensive review by selected experts in the field of reproductive health.
- **Incorporation of the comments and suggestions:** All comments and suggestions of reviewers were discussed in detail to be incorporated.
- **Approval of the guidelines by Technical Committee, National AIDS Committee and the MOHFW:**TC, NAC and the MOHFW approved the guidelines. The approved guidelines were adopted as The National STI Management Guidelines 2018 for Bangladesh.

1.5 Users of the guidelines

The target groups for using the guideline are:

- STI service providers who work in different GOB, NGO and private service delivery centers.
- Clinicians who are involved in STI treatment
- Programme personnel involved in STI management and care
- Sub-Assistant Community Medical Officers (SACMO), Family Welfare Visitor (FWV), Medical Assistants.
- STI and other specialists.
- Academicians especially who are involve in medical teaching including Universities, Colleges and training institutes.
- Research scientists

Section-2
Sexually Transmitted Infections (STIs): Epidemiology & Principals of Management

2.1 Epidemiology

The burden of morbidity and mortality worldwide resulting from sexually transmitted pathogens compromises quality of life through deleterious effects on sexual and reproductive health, newborn and child health. Sexually transmitted infections (STIs) e.g. chlamydia, gonorrhoea and syphilis increase risk of sexual transmission of HIV by two to three folds[1] and cause cellular changes that precede some cancers. STIs are a major global cause of acute illness, infertility, long term disability and death, with severe medical and psychological consequences for millions of men, women and infants.[2]

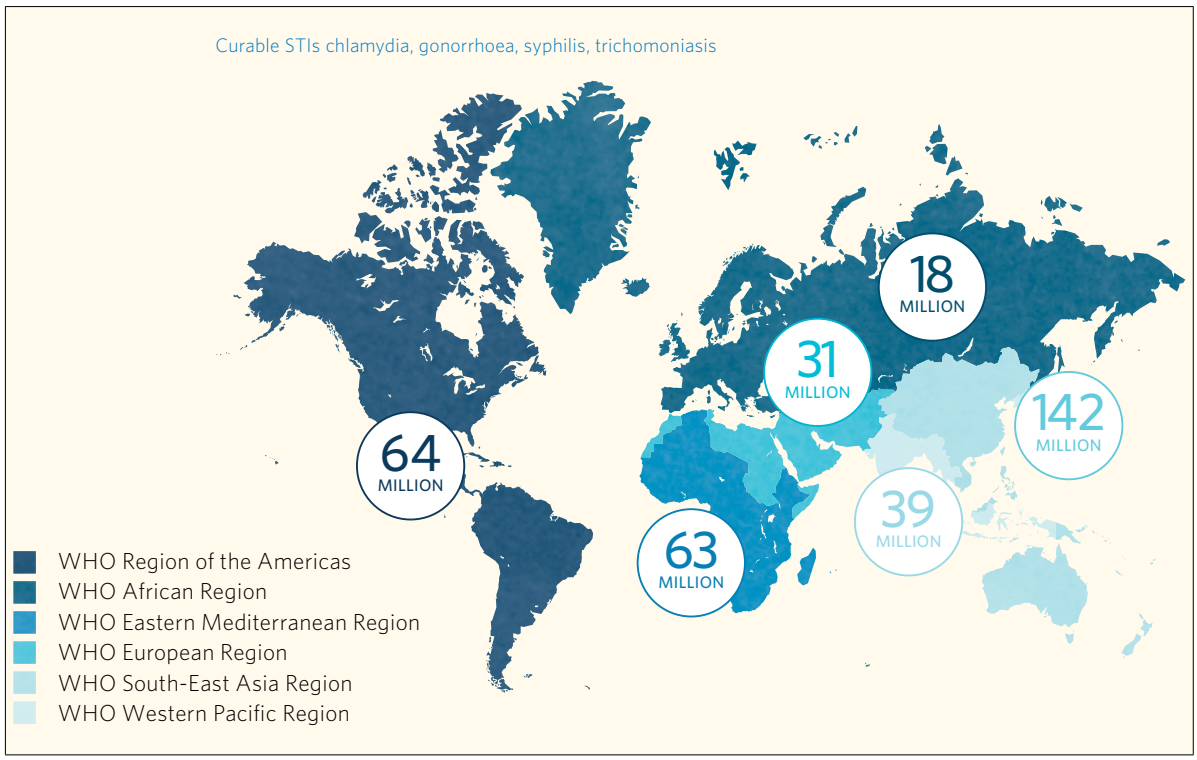

Figure 1: WHO estimates: 357 million new cases of curable sexually transmitted infections in 2012

1 WHO. Growing antibiotic resistance forces updates to recommended treatment for sexually transmitted infections. 30 August 2016.

2 Piot. P. and M.Q. Islam, Sexually transmitted diseases in the 1990s. Global epidemiology and challenges for control. Sex Transm Dis, 1994.21(2 suppl): p. ST-13.

2.1.1 Global and regional scenario of different STIs

The global burden of STIs remains high. More than 1 million STIs are acquired every day worldwide. In 2012, there were an estimated 357.4 million of new infections of curable STIs. Regional distribution and global estimates of incidences of the four curable STIs – chlamydia, gonorrhoea, syphilis and trichomoniasis are shown in (Figure 1) and (Figure 2) respectively. The highest number of new infections is caused by trichomonas vaginalis followed by chlamydial infection. New infection of syphilis is only 2% of the total estimated new infections of curable STIs. Even though, over 900,000 pregnant women were infected with syphilis resulting in approximately 350,000 adverse birth outcomes including stillbirth in 2012. However, the data on Syphilis is promising and suggest a decreasing trend over time. Also, the other previously common infections, such as chancroid and lymphogranuloma venereum (LGV) have nearly disappeared in many countries.[3]

Globally the burden of viral STIs is high, with an estimated 417 million prevalent cases of herpes simplex virus (HSV) infection and approximately 291 million women infected with human papillomavirus (HPV). Across the region, higher numbers of women suffer more from viral STIs (Figure 3).[4]

Since 2013, Global AIDS Response Progress Reporting has included syndromic case reporting based on clinical diagnosis for urethral discharge (UD) and genital ulcer disease (GUD); and etiological case reporting based on laboratory diagnosis for syphilis and gonorrhoea.

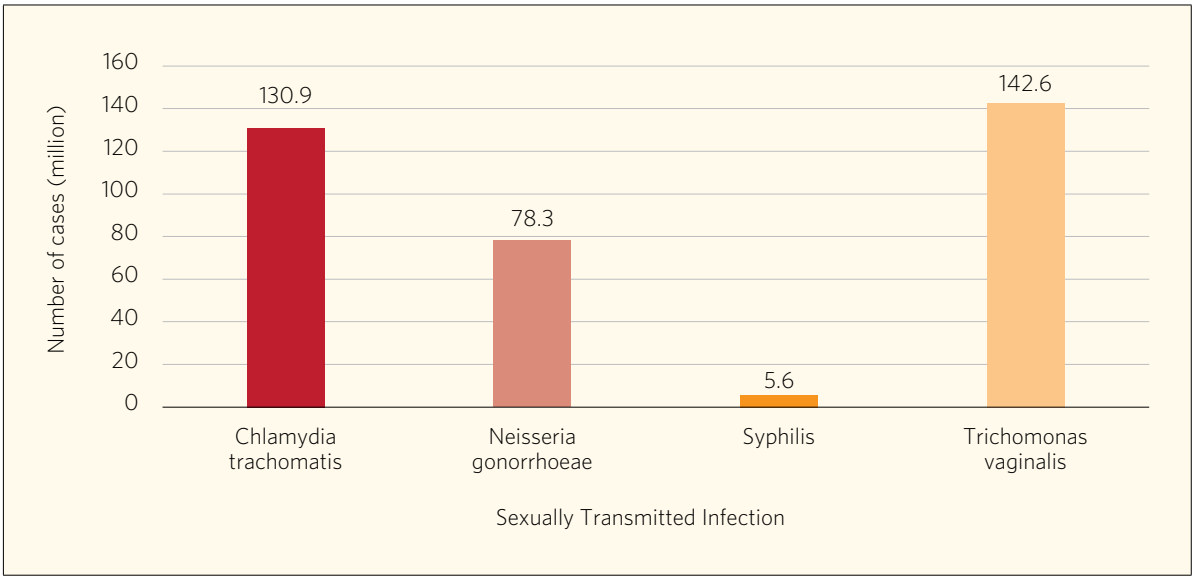

Figure 2: Global estimates of new cases of curable STIs in 2012

In 2014, 56 countries, mostly from the African Region, the Region of the Americas and the Western Pacific Region reported data on UD and GUD. The highest case rates were reported in the African Region, followed by the Western Pacific Region. In the region of Africa, Eastern Mediterranean and Europe, the women had disproportionately higher GUD case rate (Table 1).

3 WHO. Report on Global Sexually Transmitted Infections Surveillance. 2015.

4 WHO. Global Health Sector Strategy on Sexually Transmitted Infections, 2016-2021; June 2016.

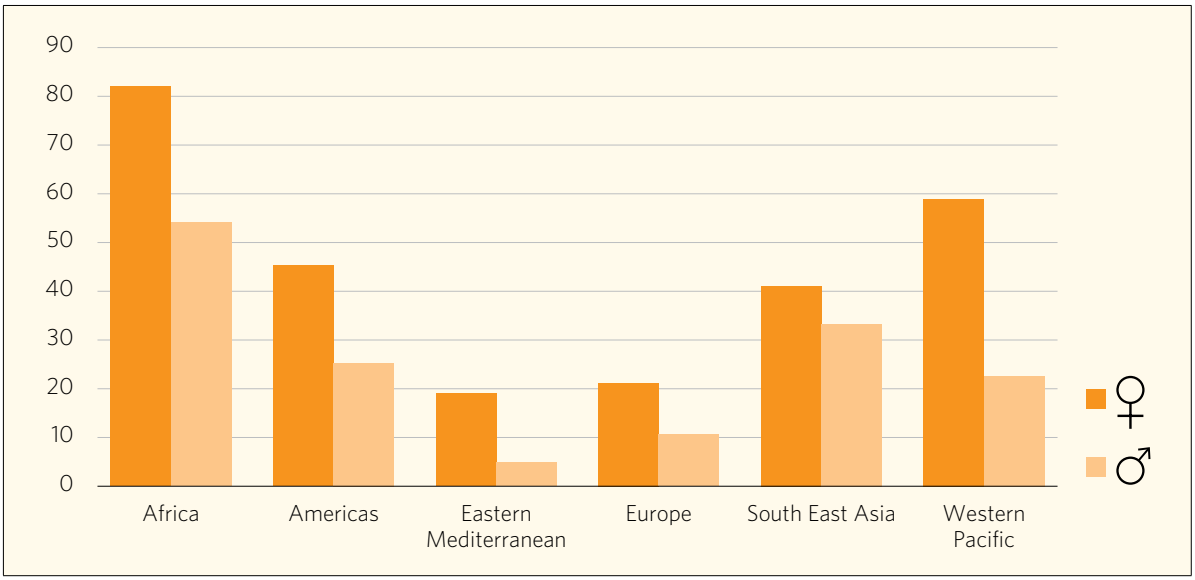

Figure 3: Estimated prevalence of HSV 2, by region and sex, 2012

Table 1: Urethral discharge rate (cases per 100,000 adult males) and Genital ulcer disease rates (cases per 100,000 adult population) reported by 56 countries, by region, 2014.

WHO region	Urethral Discharge Syndrome		Genital Ulcer Disease Syndrome			
	No. of countries reporting	UD case rate	No. of countries reporting	GUD case rate		
		Male UD case rate (Median)		Total GUD case rate (Median)	Male GUD case rate (Median)	Female GUD case rate (Median)
African Region	20	568.6	20	202.0	195.4	308.9
Region of the Americas	11	74.6	13	20.7	24.2	16.7
Eastern Mediterranean Region	8	24.1	8	12.0	10.6	17.5
European Region	1	222.7	1	9.8	3.4	16.2
South-East Asia Region	5	12.1	5	14.6	7.4	9.8
Western Pacific Region	11	140.6	9	19.8	24.8	11.7
Overall	56	143.5	56	27.4	24.5	24.1

Etiological case reporting includes two STI etiologies e.g. *N. gonorrhoeae* and *Treponema pallidum* causative agents of UD and GUD. Both infections are preventable and treatable. As reported by 53 countries in 2014, the median male gonorrhea case rate was 25.5 cases per 100,000 adult males with the highest case rates reported in the Western Pacific Region. During the same time, median syphilis was 25.1 per 100,000 adult population among the 55 reporting countries (Table 2).

Table 2: Male gonorrhoea rate (cases per 100,000 adult males) reported by 53 countries and syphilis case rates (cases per 100,000 adult population) reported by 55 countries, by region, 2014.

WHO region	Male gonorrhoea case		Adult syphilis case			
	No. of countries reporting	Gonorrhoea case rate	No. of countries reporting	GUD case rate		
		Male gonorrhoea case rate (Median)		Total	Male GUD case rate (Median)	Female GUD case rate (Median)
African Region	5	50.1	7	46.6	22.5	43.1
Region of the Americas	18	29.3	18	34.1	34.2	17.7
Eastern Mediterranean Region	6	3.2	5	2.8	2.6	8.1
European Region	9	25.5	11	6.2	10.1	6.6
South-East Asia Region	4	7.0	4	5.9	6.7	5.1
Western Pacific Region	11	88.6	10	93.0	54.6	81.0
Overall	53	25.5	55	25.7	17.2	17.7

Causative agents of UD and GUD are preventable and treatable. So, Global STI Strategy has called for immediate action for UD, GUD as well as HPV infection for which cost-effective interventions already exist. These three are listed below along with the reasons why they have been prioritized globally:

- ***Neisseria gonorrhoeae (gonorrhoea)*** – because of increasing resistance to treatment and the high risk of coinfection with other STIs, especially chlamydia (both gonorrhoea and chlamydia are major causes of infertility)
- ***Treponema pallidum (syphilis)*** – due to its impact on pregnant women (there are over 200,000 fetal and neonatal deaths each year due to syphilis in pregnancy)[5]
- ***Human papillomavirus (HPV)*** – because of its link to cervical cancer (approximately 291 million women have an HPV infection; HPV causes 530,000 new infections and 266,000 deaths from cervical cancer each year)[6].

2.1.2 National scenario of different STIs

- **STIs among general population**

In Bangladesh, data on STIs among general population is very limited. According to Bangladesh Demographic and Health Survey (BDHS), 14% of ever-married women report having had an STI and/or symptoms of an STI in the 12 months preceding the survey.[7]

5 Wijesooriya NS, Rochat RW, Kamb ML, Turlapati P, Temmerman M, Broutet N et. al. Global burden of maternal and congenital syphilis in 2008 and 2012: a health systems modelling study. Lancet Glob Health. 2016;4: e525-33.

6 Global health sector strategy on sexually transmitted infections 2016–2021: towards ending STIs. Geneva: World Health Organization; 2016 (http://www.who.int/reproductivehealth/publications/rtis/ghss-stis/en/).

7 National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2016. *Bangladesh Demographic and Health Survey 2014*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International.

In a study conducted in 2010 among patients who attended in out-patient department of Dermatology of Dhaka Medical College, prevalence of gonorrhea, syphilis, non-gonococcal urethritis, chancroid, genital herpes and genital warts were found 29.58%, 12.68%, 41.58%,4.93%,8.45% and 2.82% respectively. Prevalence was almost four times higher among males. The highest prevalence rate was found in age group of 25-34 years.[8] A cross-sectional study conducted among the slum dwellers in Dhaka found prevalence of syphilis infection in 6.0%, HBsAg in 3.8%, gonorrhoea in 1.7% and chlamydia in <1%of respondents. Men were more than twice as likely as women to be infected with syphilis or HBsAg carriers. Behaviors facilitating STI transmission were common among men.[9]

- **STIs among key populations (KPs)**

In regard to key populations, about 30% of Female Sex Workers (FSWs), only 3% People who inject drugs (PWIDs), 6% Men who have sex with men (MSM), 10% male sex workers (MSWs) and 9.1% of Hijra complained of at least one STI in the last year preceding the survey.[10] Over the years from 2004-2016, no significant change was observed in the prevalence of active syphilis in male PWID in some part of Dhaka (A1). However, a rising trend in the prevalence was observed in male PWID in other part of Dhaka (A2) from 1.5% in 2004 to 2.4% in 2016 ($p<0.05$). However, the overall prevalence has always been below 5%. In Dhaka and Narayanganj, the prevalence of active syphilis among female PWID has been similar (5.8%) between 2011 and 2016. Active syphilis was <5% in FSWs from all sites in 2016 and a significant decline over the years was observed among street and hotel based FSWs in Dhaka and brothel based FSWs ($p<0.001$ for all).[11]

According to a study conducted in 2016, prevalence of gonorrhea, chlamydia, and active syphilis were 5.1%, 4.6%, 1.3% in street FSWs and were 5.8%, 8.2%, and 0.6% for residence FSWs which are lower compared with the previously reported rates.[12] Referring knowledge of STI symptoms, more than 80% of FSWs, PWIDs, MSM, MSWs have knowledge on some STI symptoms. Knowledge on STI symptoms is less among Hijras.[13]

The majority of STIs have no symptoms or only mild symptoms that may not be recognized as an STI. Most symptomatic patients seek treatment from unqualified pratitioners such as drug seller, canvasser/traditional healer, advice/treatment from friends and self-medication. Referring to general population, the proportion of women who sought advice or treatment for an STI from aclinic, hospital, or health professional increased from 31 percent in 2011 to 46 percent in 2014.[14]

In case of KPs, in 2016, as far as treatment seeking behavior is concerned, ranging from two-fifths to four-fifths of FSWs, 36.5% PWIDs, 48.4% MSM, 73.8% MSW and 60% Hijras did mention their first choice of seeking care for the last STI symptom 12 months preceding the survey was

8 Ali CM et. al; Pattern of Sexually Transmitted Diseases among Patients Attending Out-patient Department of Dermatology of Dhaka Medical College Hospital, Dhaka; J Dhaka Med. Coll. 2010; 19(1): 7-10.

9 K. M. Sabin et. al; Sexually transmitted infections prevalence rates in slum communities in Dhaka, Bangaldesh; International Journal of STD & AIDS; 2003; 14: 614-621.

10 Behavioural and Serological Surveillance amongst Key Populations at Risk of HIV in Selected Areas of Bangladesh. November 2017.

11 ASP, IEDCR, icddr, b, UNICEF. Behavioural and Serological Surveillance amongst Key Populations at Risk of HIV in Selected Areas of Bangladesh, 2016.

12 Khanam et al. (2016). Sexually transmitted infections and associated risk factors among street based and residence based female sex workers in Dhaka, Bangladesh. Sexually Transmitted Diseases, 44(1):22-29.

13 Behavioural and Serological Surveillance amongst Key Populations at Risk of HIV in Selected Areas of Bangladesh. November 2017.

14 National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2016. *Bangladesh Demographic and Health Survey 2014*. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT, Mitra and Associates, and ICF International.

qualified practitioners. On average, they waited 9.5 days before seeking treatment.[15] Since effective STI case management represents the cornerstone of STI control, STI control efforts must go beyond case management, given that only a small proportion of people with STIs access health care services. According to STI treatment cascade (Figure 4)[16] less number of patient complete treatment and get cured among those who seek treatment.

2.2 Definitions

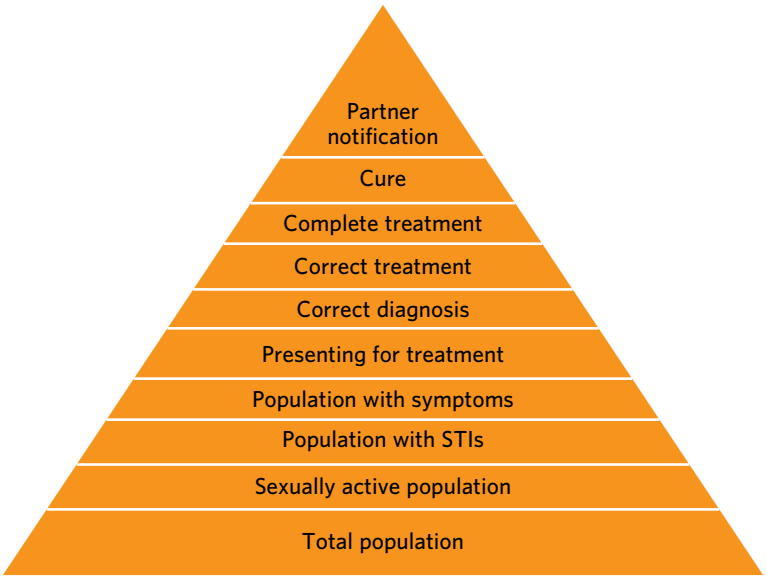

Figure 4: STI Epidemiology Model and Care Seeking Behavior

Sexually transmitted infections (STIs): STIs are a diverse group of infections that are transmitted exclusively or primarily by sexual or intimate personal contact. These include infections caused by bacteria, virus, protozoa, spirochete and parasites.

Reproductive Tract Infections (RTIs): RTIs are a diverse group of infections that affect organs of reproducing tract. They may be STIs or endogenous infections (infections that occur due to a change in the eco system of reproductive tract and not generally transmitted to sexual partners) or iatrogenic infections (infections that are introduced to the reproductive tract due to improper infection prevention in a medical or surgical procedure, unsafe septic abortion and unhygienic deliveries).

There is a clear distinction between RTIs and STIs. RTI includes all infections of the reproductive tract irrespective of mode of transmission. Some STI, e.g. HIV and Hepatitis B, are acquired by sexual contact but not usually infect the reproductive tract. Some infections such as pelvic inflammatory disease (PID)) can be iatrogenic RTIs when caused by infection but are labeled as STIs when caused by sexually acquired pathogens like *N. gonorrhoeae* and/or *C. trachomatis.*

15 Behavioural and Serological Surveillance amongst Key Populations at Risk of HIV in Selected Areas of Bangladesh. November, 2017.

16 MoH, Federal Democratic Republic of Ethiopia Ministry of Health National Guidelines For The Management Of Sexually Transmitted Infections Using Syndromic Approach. 2015.

2.3 Classification

More than 30 different bacteria, viruses and parasites are known to be transmitted through sexual contact. Eight of these pathogens are linked to the greatest incidence of sexually transmitted disease. Of these 8 infections, 4 are currently curable: syphilis, gonorrhoea, chlamydia and trichomoniasis. The other 4 are viral infections and are incurable: Hepatitis B Virus (HBV), Herpes simplex virus (HSV), HIV, and Human papillomavirus (HPV)[17].

STIs/RTIs are broadly categorized into four groups (Table 3).

Table 3: Classification of STIs/RTIs

Type of STIs/RTIs	Examples
Ulcerative STI	Syphilis, chancroid, lymphogranuloma venereal (LGV), genital herpes
Non-ulcerative STI	Gonorrhoea, chlamydia, trichomoniasis
STI not infecting reproductive tract	HIV, hepatitis-B
Non-Sexually transmitted RTI	Candidiasis, bacterial vaginosis

2.4 Consequences

Failure to diagnose and treat STIs/RTIs at an early stage may result in serious biological complications (Table 4) and sequelae. Most STIs/RTIs can affect both men and women, although the consequences for women are more common and more severe than for men. Also, the long-term consequences of STIs/RTIs have considerable social and economic impact.

2.4.1 Biological Consequences

Table 4: Biological consequences of STIs/RTIs

In women	In men	In newborn
• Infertility • Chronic abdominal pain • Ectopic pregnancy • Cervical cancer • Preterm delivery • Spontaneous abortion • Intrauterine death of fetus • Increased risk for acquisition • of HIV infection • Neurosyphilis	• Urethral stricture • Infertility • Increased risk for acquisition of HIV infection • Neurosyphilis	• Congenital malformation • Potentially blinding eye infections or pneumonia • Perinatal deaths including stillbirths • Increased risk for acquisition of HIV infection

17 WHO. Sexually Transmitted Infections; Key Facts; 3 August 2016.

2.4.2 Social and Economic Consequences

- Physical and psychological discomfort of the individual
- Stigma and social harassment
- Infertility leading to conflict between couples, divorce and commercial sex
- Cost of treatment
- Days of productivity lost
- Isolation and discrimination in society

2.5 Transmission

STIs are transmitted by several ways. Routes of STIs transmission from person to person can be grouped primarily under horizontal and vertical means.[18]

2.5.1 Horizontal transmission

- **Sexual intercourse:** Unprotected sexual intercourse is the main route of transmission of STI. These include penovaginal, peno-anal. Penooral sex, and vagino-vaginal intercourse.
- **Intravenous drug use:** HIV and hepatitis B and C are transmitted by needle sharing and through body fluids.
- **Physical contact during sexual intercourse:** Genital ulcer diseases such as chancroid and herpes (on perianal and scrotal region) can be transmitted during condom protected sexual act.
- **Through blood and blood product:** Unscreened blood and blood products can transmit HIV, hepatitis and syphilis.
- **Medical procedures and sharps:** Use of contaminated syringes, accidental pricks for doctors or nurses, and use of contaminated instruments during surgical procedures can transmit some STIs

2.5.2 Vertical transmission: Vertical transmission of STIs occurs between mother and child.

- **During pregnancy:** HIV, Hepatitis B and Syphilis can be transmitted from mother to child during pregnancy.
- **At delivery:** Opthalmia neonatorum (caused by *N. gonorrhoeae* and *C. trachomatis*), HIV and Hepatitis B can be transmitted from mother to child during delivery.
- **Through breast-feeding:** HIV & Hepatitis B virus can be transmitted from mother to child through breast milk.

18 Previous document reference 5 Dallabetta, G., ed. Control of Sexually)' Transmitted Diseases. 1996, Family Health International.

2.5.3 Factors affecting transmission

Many social factors affect transmission of STI including economic, educational, individual awareness of STI, social stigma, and health services.

- Lack of knowledge and awareness about STIs and routes of transmission of STIs
- Failure to follow safer sex practices
- Inadequate access to STI health services
- Limited access to STI health service facilities
- Unaffordable cost for STI treatment
- Poor compliance to STI management
- Improper partner treatment due to lack of contact tracing
- Poverty, social instability, natural disasters, food insecurity, child labor, gender inequity and community inequalities
- Social stigma

2.6 Management of STIs

2.6.1 Principles of management

Management of RTIs/STIs is based on few principles:[19]

1) Cure of acute infection both symptomatic and asymptomatic
2) Prevention of long term consequence of STIs
3) Prevention of transmission of infection to sex partner and to the fetus in case of pregnancy
4) Presumption of acquisition and transmission of HIV
5) Promotion of treatment adherence or compliance
6) Changes in treatment regimen based upon periodic antimicrobial resistance assessment

Additional STI management principles for KPs:[20]

Most of the health facilities which are equipped and oriented to serve the general public are not friendly to carry out management of STIs among KPs. As a result, KPs find it difficult to access clinical services in public, private, NGO health facilities. Moreover, KPs are often reluctant to attend regular clinics because they are often badly treated, stigmatized or rejected. Therefore, the following guiding principles are worth considering ensuring increased uptake and friendly STI services to KPs. The services need to be guided by the principle of three **A's**, which is Accessible, Acceptable and Appropriate:

19 Dallabetta, G., ed. Control of Sexually Transmitted Diseases. 1996, Family Health International.

20 MoH, Federal Democratic Republic of Ethiopia Ministry of Health. National Guidelines for the Management of Sexually Transmitted Infections Using Syndromic Approach. 2015.

- **Accessible Services**

The service delivery outlet health facilities are expected to be conveniently located to KPs (e.g. near the identified "hotspots" and transport routes) and open at hours that are acceptable to the targeted population. Accessible interventions limit the number of logistical barriers, thereby increasing the number of individuals seeking health services.

- **Acceptable Services**

The health facilities should not only be accessible but also be acceptable to KPs. Health facilities should be friendly for KPs.

- **Appropriate Services**

Health Services must be culturally appropriate and based on the needs of the local KPs. Service providers should be trained on the specific health needs of KPs.

In summary, health care providers at all service delivery points should take into consideration the following principles which contribute to effectiveness and sustainability of STI interventions when dealing with KPs:

- Respect KPs' human rights and accord them basic dignity (e.g. services are voluntary)
- Respect KPs' views, knowledge and life experiences
- Ensure interventions do no harm
- Recognize that KPs are part of the solution, as they are usually highly motivated to improve their health and well-being
- Include clients/partners/controllers/gatekeepers
- Adapt to the diversity of KPs and their settings and people involved

All public, private, NGO and faith based health facilities are expected to provide KPs friendly STI services as per the guideline.

2.6.2 Approaches for diagnosis of STI

Diagnosis of STI is the first step of management of STI. Globally, service providers use one of the three diagnostic approaches: etiologic, clinical and syndromic approach. Difference between theses approches are depicted in Table-5.

- **Etiologic approach*:*** This approach is based on the identification of specific causative agents or serological confirmation of the presence of specific causative agents using laboratory tests and giving treatment targeting to the pathogen identified.

Table 5: Advantages and disadvantages of different STI diagnostic approaches[21]

Diagnostic Approaches	Advantages	Challenges
Etiologic	• Avoids over treatment. • Can be used to screen asymptomatic patients. • Satisfies patients who feel not properly attended.	• Testing facilities usually not available at primary health care level where many patients seek care for STI. • Identifying more than 30 STI causative agents requires skilled personnel and sophiscated laboratory equipment. • Laboratory tests are expensive and time consuming which results in delay in treatment and reluctance of patients to wait for laboratory results. • Mixed infections often overlooked, thus miss treatment/under treatment can lead to complications and continued transmission.
Clinical	• Saves time for patients • Reduces laboratory expenses	• Requires special training on STIs and high clinical skill. • Mixed infections often overlooked. Even the most experienced RTIs/ STIs specialists find it difficult to diagnose a case with mixed or secondary infections or to identify mal-treated cases presenting with altered symptoms. Furthermore. HIV infection can greatly change the clinical picture of RTIs/STIs. • Does not identify asymptomatic STIs
Syndromic	• Reduces probability of incorrect clinical diagnosis by dealing with most likely causative agents. • Presents an alternative when laboratory support is not available. • Standardizes treatment at all levels of the health system. • Allows patients to be treated effectively at their first visit. • Uniformity in collecting data. • Can be used even at primary health care level. • Easy to train health care providers. • Simple and easy to follow. • Cost-effective. • Can be provided by any category of health service providers e.g. FWVs, nurses & paramedics.	• Possibility of over-treatment. • Undue exposure to potential side effects of drugs due to over treatment. • Cannot be used for asymptomatic patients (based upon risk assessment is high for females). • Health care provider feels uncomfortable being unable to use his/her clinical experience. • Drugs provided may be resistant to STI pathogens. • Requires prior research to determine the common causes of particular syndromes. • Has low specificity and positive predictive value for detecting cervical infections in women presenting with vaginal discharge.

21 MoH, Federal Democratic Republic of Ethiopia. National Guidelines for the Management of Sexually Transmitted Infections Using Syndromic Approach. July 2015.

- **Clinical approach:** Using clinical experience, a clinical diagnosis of typical and specific STIs is made based on patient symptoms noted during clinical examination. Treatment is given targeted to the suspected pathogen(s).
- **Syndromic approach:** Identification of clinical syndrome and giving treatment targeting all the locally know pathogens which can cause the syndrome.

In addition, **presumptive treatment approach** is followed for KPs in certain context. No diagnostic approach is needed for providing treatment for STIs for KPs. Treatment is done periodically on assumption. In this strategy, a target population is treated for STIs periodically based on risk behavior and syndromes. Asymptomatic infections are also treated if the subject's risk assessment is positive. Risk assessment criteria are selected on the basis of local STI prevalence, number of clients and condom use.

A mix of etiologic, clinical and syndromic approach is practiced for diagnosis and management of STIs in Bangladesh. Category of STI service provider, level of skills and length of experiences of the provider, existence of lab facilities and associate lab personnel, availability of instruments and lab logistics, type of population served, level of health care facility largely determine the STI diagnosis approach to be followed. For example, clinical approach is only possible in setting where highly skilled and experienced clinicians provide STI services. Similarly, etiology based STI diagnosis can be done in the places where lab facility, testing kits, reagents and skilled lab technologists are available. However, huge number of primary health care facilities -both public and private in urban and rural settings neither do have expert clinicians nor have lab facilities including technologists. Eventually, these facilities are largely dependant on syndromic approach for STI diagnosis. Syndromic and Etiologic approach are discussed in detail section-5 and section-6 respectively.

2.7 Expanding antimicrobial resistance: Increasing difficulties in STIs treatment

Chlamydia, gonorrhoea and syphilis are generally curable with antibiotics. However, these STIs often go undiagnosed and are becoming more difficult to treat, with some antibiotics now failing because of misuse and overuse. Resistance of these STIs to the effect of antibiotics has increased rapidly in recent years and has reduced treatment options. Of the 3 STIs, gonorrhoea has developed the strongest resistance to antibiotics. Strains of multidrug-resistant gonorrhoea that do not respond to any available antibiotics have already been detected. Such high levels of antimicrobials resistance of gonococcus may result in untreatable infections in future and lead to severe complications and sequelae in both men and women.[22] Antibiotic resistance in chlamydia and syphilis, though less common, also exists, making prevention and prompt treatment critical. Resistance to azithromycin has been reported in some strains of Treponema pallidum and treatment failures have been reported for tetracyclines and macrolides in the treatment of Chlamydia trachomatis. Low-level resistance to Trichomonas vaginalis has also been reported for nitroimidazoles, the only available treatment.[23]

On this backdrop, the antimicrobial susceptibility monitoring is essential for determining the effectiveness of drugs used for syndromic management at country level. Since using appropriate antimicrobial agents is a key cornerstone of syndromic management.

22 WHO. Growing antibiotic resistance forces updates to recommended treatment for sexually transmitted infections. News release. 30 August 2016.

23 WHO. Guidelines for the treatment of Neisseria gonorrhoeae. 2016.

In 2014, a cross-sectional bio-behavioral survey of STIs was conducted in Bangladesh among key populations (KPs) at risk of HIV infection to examine antimicrobial resistance to *N. gonorrhoea* (Table-6). KPs included FSWs, females who injected drugs, male sex worker and hijras. Result shows that all the samples containing *N. gonorrhoeae* were susceptible to ceftriaxone and spectinomycin. The next most sensitive antibiotic was azithromycin (90.5%), followed by cefixime (85.7%). None of the samples were sensitive to ciprofloxacin, to which resistance was found in 95.2% and intermediate resistance in 4.8% of the samples. More than 90% of the samples were resistant to doxycycline. Multidrug resistance (against three or more antibacterial agents) was identified in 48% of the samples.[24]

Table- 6: Antimicrobial susceptibility to *N. gonorrhoeae*

Drug	% (n) of samples with sensitivity or resistance		
	Sensitive	Intermediate	Resistant
Cefixime	85.7 (18)	0 (0)	14.3 (3)
Azithromycin	90.5 (19)	0 (0)	9.5 (2)
Ceftriaxone	100 (21)	0 (0)	0 (0)
Ciprofloxacin	0 (0)	4.8 (1)	95.2 (20)
Doxycycline	4.8 (1)	4.8 (1)	90.5 (19)
Penicillin G	4.8 (1)	61.9 (13)	33.3 (7)
Spectinomycin	100 (21)	0 (0)	0 (0)

The existing National STI guideline of Bangladesh recommends treatment of gonorrhea and chlamydia with cefixime and azithromycin. However, WHO recommends discontinuation of drugs when the resistance level goes above 5%. Cefixime and azithromycin, both drugs have already crossed the threshold resistance level. Hence, these data warrant the need to update the treatment options for STI management in new national guidelines of Bangladesh.

2.8 Compliance

Compliance to treatment, partner notification and management, and condom use is essential for STI control using syndromic management approach. There is no global data on the compliance of treatment after syndromic management and social stigma associated with STI often hampers partner notification and management. However, only a few country level sporadic data are available.

2.9 Vaccination

Many people do not realize that there are vaccines available to prevent certain sexually transmitted diseases (STDs). Infections by three common viruses i.e. HPV, HBV and HAV can be prevented if people get vaccinated prior to engaging in sexual activity.

24 Khanam R, Ahmed D, Rahman M, Alam MS, Amin M, Khan SI, Mayer KH, Azim T. 2016. Antimicrobial susceptibility of Neisseria gonorrhoeae in Bangladesh, 2014 update) Antimicrob Agents Chemother 60:4418-4419.

Section-3
Sex, Gender and Sexuality

3.1 Sex

Sex refers to the biological characteristics that define humans as female or male.[25] While these sets of biological characteristics are not mutually exclusive, as there are individuals who possess both, they tend to differentiate humans as males and females. In general use in many languages, the term sex is often used to mean "sexual activity", but for technical purposes in the context of sexuality and sexual health discussions, the above definition is preferred.

3.2 Gender

The term 'gender' refers to the socially constructed roles and responsibilities assigned to women men and intersex in a given culture or location and the societal structures that support them. Gender is learned and changes over time. Gender refers to a person's self-representations as man and woman or how that a person is responded to by social institutions based on the individual's gender presentation. Gender is rooted in biology and shaped by environment and experience. Gender is expressed masculine and feminine. Those who exist outside these groups fall under the umbrella terms non-binary or transgender/gender queer. Some cultures have specific gender roles that are distinct from "man" and "woman," such as the hijras of South Asia. These are often referred to as *third genders*.

3.2.1 Differences between Sex & Gender

Gender differences delineate those differences that exist between men women and intersex by definition it takes into consideration the environment (Table-1). Health outcomes are some mixtures of the interaction between biology and the environment within which men, women and intersex experience them. It is therefore common to use gender differences as a blanket term for sex and gender differences then speaking about people because they can't be separated from their environment. To be effective, the service providers should be aware and act on gender issues and perspective as they relate to service delivery and use. Men, women and intersex/transgender lead very different lives and can expect to have different kinds of opportunities, rights, roles and relationships. In many cases, men, women and intersex/transgender are not only treated differently, but also unequally. In particular, women and transwomen often have less social, political and economic power and resources. Many people believe that these inequalities are natural, because of biological differences between men, women and intersex. But inequalities between women, men

25 World Health Organization

and transwomen are more often the result of social definitions of what it means to be a man or a woman, particularly in terms of different kinds of opportunities, rights, roles and relationships. Bangladesh is a male-dominated society. Being born female, male or intersex makes a significant difference to a person's life in Bangladesh.

Table 1: Comparison and contrast

Sex	Gender
Biological	Social
Universal	Culture specific
Does not change (usually)	Changes over time
Differences	Hierarchy

3.3 Sexuality

Sexuality is a central aspect of being human throughout life and encompasses sex, gender identities and roles, sexual orientation, eroticism, pleasure, intimacy and reproduction. Sexuality is experienced and expressed in thoughts, fantasies, desires, beliefs, attitudes, values, behaviors, practices, roles and relationships. While sexuality can include all of these dimensions, not all of them are always experienced or expressed. Sexuality is influenced by the interaction of biological, psychological, social, economic, and political, cultural, ethical, legal, historical and religious and spiritual factors. Sexuality is more than just sexual behavior. A person's sexuality affects their experience of sex including what they feel about it and how, when, where and with whom they have it. A person's sexuality is also connected with their experience of risk of HIV infection. Understanding how people's sexuality develops and what influences its development can enable people to express or experience their sexuality differently and to protect themselves from HIV AIDS. Appreciating the influences on the development of sexuality and its connections with vulnerability can help communities decide on what action to take to reduce this vulnerability.[26]

3.3.1 Sexuality includes/Criteria of Sexuality

- ***Anatomy and reproductive health*:** biological sex, puberty, contraception, safer sex, sexually transmitted infections (STIs). HIV, pregnancy. Childbirth, menopause, hygiene, and general health care.
- ***Gender identity and gender role*:** how we see ourselves as man, woman, or other, feelings about what it means to be and act like a man, woman, or other.
- ***Relationships*:** behaviors, expectations, satisfaction, and abuse
- ***Love and affection*:** how we express love and affection to friends, family and romantic partners
- ***Body image*:** how we feel about our bodies, how we treat our bodies, and how attractive we feel
- ***Sexual orientation*:** physical and emotional attraction to a man, woman, both, or neither
- ***Sensuality/pleasure*:** accepting and enjoying our own bodies and accepting and enjoying the bodies of our Partner; reciprocal enjoyment
- ***Sexual activity*:** acts of intimacy such as hugging, kissing, touching, and sexual intercourse

26 World Health Organization.WHO (2006a). Defining sexual health: Report of a technical consultation on sexual health, 28–31 January 2002. Geneva

3.3.2 Sexuality through the life cycle

- Components of sexuality in the life cycle
- First becoming aware of sexual feelings and desires
- Becoming aware of changes in the body
- Getting information and messages about sex before having had sex (what kind? from whom?)
- First sexual experience
- Manage, partnership, separation or divorce
- Getting pregnant, giving birth, having an abortion
- Becoming a parent
- Episodes of ill-health related to sex and traumas (for example, rape or sexual abuse)

3.4 Sexual Health

Sexual and reproductive health is one of the most important and sensitive areas of human experience. Sexual health is the integration of the somatic, emotional, intellectual, and social aspects of sexual being; in ways that are positively enriching and that enhance personality, communication, and love.[27] Fundamental to this concept are the right to sexual information and the right to pleasure.

3.4.1 Behaviors of a sexually healthy adult

3.4.1.1 Sexual behavior

Sexual activity is a basic and universal behavior. However, humans are not "driven" by an inner force to have sex. Such a concept assumes living organisms are inert and must be driven to activity. Humans are alive and manifest sexual behavior along with other kinds of activities. For example, speaking, laughing, walking and reading all occur without a respective drive. The biological factors leading to human sexual arousal and orgasm are common to men and women, but how we think, feel and behave concerning erotic responses are socially learned. There is great variation in the sexual behavior of humans. There appear to be two major outcomes of erotic beliefs and customs: physical pleasure and psychological intimacy. These outcomes are both very powerful and they reinforce each other. The joy of sexual arousal and orgasm, and the feelings of physical and psycho logical intimacy provided by sexual contact, are incomparable experiences. People seek this joy in ways unique to their sex, gender identity and roles, sexual orientation, erotic experiences and reproductive desires.

3.4.1.2 Sexual Orientation

Sexual orientation is an integral part of sexual identity, essentially defined by whom we are emotionally or physically attracted to. Sexual orientation can be heterosexual, homosexual, bisexual or questioning latter which may be unsure of their orientation. Sexual orientation exists along a continuum that ranges from exclusive homosexuality to exclusive heterosexuality and includes various forms of bisexuality. All of these sexual orientations are considered to be normal by prominent mental health organizations. Different and complex sexual identities and orientations

27 WHO,2002

have been found in Bangladesh and all over the world. Societies, including Bangladeshi society judge the value of a person's character on the basis of their sexual orientation or identity. Many discriminate men sex with men (MSM), lesbians, bisexuals and trans-gendered people, regardless of how compassionate successful they may be within those societies.

3.4.2 Sexual Identity or Gender Identity

Sexual identity or gender identity is the personal or private belief. Each of us has fall in feminine, masculine or third gender category. Gender is sometimes referred to as sexual identity. It is the degree to which one identifies with the social and biological aspects of a man, a woman or a transgender. Usually men and women identify primarily with their biological sex but trans-gendered people identity the biological and social characteristics of the other gender. For example, a number of persons born with a male body feel those are women trapped in men's bodies. Their personal sexual identity is that of a woman. Transgender women known as Hijra are frequently born with male body but the personal sexual identity may be neither man nor woman.

3.4.2.1 Types of Sexual Orientations and Identities

Heterosexual: Persons who are attracted to and choose to share their bodies sexually with persons of the opposite gender only are called heterosexuals (i.e. man-woman relationships). Generally speaking, these male-female relationships are more common. In the context of HIV-AIDS, the spread of HIV infection is highest among the heterosexual group.

Bisexual: Bisexuals are persons who frequently indulge in both homosexual and heterosexual experiences, namely they are persons who are sexually attracted to or have intercourse with both males and females. A number of homosexuals are unable to stand up to societal disapproval or family pressure for marriage and may get married, thus entering a bisexual role.

Homosexual: Persons who feel attracted to or choose to share their bodies sexually with persons of the same gender are called homosexuals. In a male-male relationship, the person may be termed "homo-phile" or "gay". In a female-female relationship the person is as a "lesbian". The reason why homosexual behavior is preferred by some is still debated. Sometimes homosexual experiences may be situational occurs in prisons, some boarding schools and colleges. The person may participate voluntarily or be forced even when he/she usually prefers heterosexual intercourse. They are known as sexual minority groups in some cultures.[28]

Transsexual: Transsexual defines a person who desires to have the sexual organs of the other sex. It is the desire, and not the ability that actually a person as transsexual. Since the 1990s, transsexual has generally been used to describe the subset of transgender people.[29] Transsexuals can be either female to male (FtM) or male to female (MtF). In Bangladesh, FtM transsexuals are very rare, and transsexuals in general do not have access to the procedures by which they can actually remove their own sexual organs and/or add the organs of the opposite sex to their bodies. In some other countries, transsexuals alter their physical appearance either by operation and/or hormones.

Men who have sex with men (MSM): Any male who has sex with another male, whether exclusively, regularly, frequently, or infrequently, for any reason. This term has come to be used to encompass men who do not identify themselves as homosexual, Gay or bisexual despite engaging

28 Sexual Identity, Sex of Sexual Contacts, and Health-Related Behaviors Among Students in Grades 9–12 — United States and Selected Sites, 2015

29 Thomas E. Bevan, The Psychobiology of Transsexualism & Transgenderism (2014, ISBN 1-4408-3127-0), p 42

in sex with other men.[30] In South Asia including Bangladesh MSM have been categorized based on their self-identified behaviors in the following manner.[31, 32, 33]

Kothi/Zenana: Feminized males who have sex with men, and may use feminine behaviors in public spaces to attract men for sex. They are usually sexually penetrated, rather than the penetrators. However, many kothis are also married to women and have children to conform to the dominant culture in which they live. They speak the language called ulti and use female make up. Kothi may sell sex or may not sell sex. Some Kothi may not express their sexual identity they are termed as "*Gupti Kothi*"

Panthi: the name given by kothi, are the sex partners of kothi and are usually insertive partners in anal or oral sex. Most panthi will identify themselves as a "man" rather than panthi. Panthis have sex with kothis; hijras because they like havng sex with males, or they like having anal/oral sex. Most panthis in Bangladesh are married to women and have children.

Parik: Parik are the male lovers of kothi, therefore, all parik are panthi, but not all panthi are parik of kothi.

'Do-parata/ Double-Decker: Do parata' is MSM who practice insertive sex with kothi, as well as receptive sex with other panthi or even with kothi. They have been given these labels of do-paratha and double decker etc. by kothis and most of them do not have a label for themselves. Some behave like kothis in public spaces to get together with panthis.

Gays: identify themselves as westernized homosexuals, engaging in emotional and sexual relationships with other men; they are generally from an educated urban class.

Transgender: Transgender people have a gender identity or gender expression that differs from their assigned sex. In other words, person who crosses gender boundaries or a man or woman that adopts the attributes of the opposite sex e.g. a hijra. The sexual preference of a transgender person often varies. Some transgender people undergo surgery to become a member of the opposite sex. Transgender is an umbrella term they also include cross-dressers regardless of their gender identity. Transgender people may identify as heterosexual, homosexual, bisexual, asexual, or may decline to label their sexual orientation. The term transgender is also distinguished from intersex.

Intersex: Intersex" is a general term used for a variety of conditions in which a person is born with a reproductive or sexual anatomy that doesn't seem to fit the typical definitions of female or male. For example, a person might be born appearing to be female on the outside, but having mostly male-typical anatomy on the inside. Or a person may be born with genitals that seem to be in-between the usual male and female types—for example, a girl may be born with a noticeably large clitoris, or lacking a vaginal opening, or a boy may be born with a notably small penis, or with a scrotum that is divided so that it has formed more like labia. Or a person may be born with mosaic genetics, so that some of her cells have XX chromosomes and some of them have XY.

Eunuch: A man who has been castrated, especially (in the past) one employed to guard the women's living areas at an oriental court.

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30 UNAIDS Terminology Guideline 2015

31 Dowsett, G., Grierson, J., & Mcnally, S. (2006). A Review of Knowledge about the Sexual Networks and Behaviours of Men who have Sex with Men in Asia. Melbourne Australia: Australian Research Centre in Sex, Health and Society (ARCSHS), La Trobe University, Melbourne Australia.

32 Culture, Health and Sexuality, 7(2), 159-169.

33 Khan, S. I., Khan, S., & Hollerbach, P. E. (2005). In their own words: the formulation of sexual and health-related behaviour among young men in Bangladesh. Naz Foundation International, icddr,b, The Catalyst Consortium.

Hijra/Transgender women: "*Hijra*" are those who identify themselves as belonging to a traditional *hijra* sub-culture and follow the guru-chela *hijra* hierarchy.[34] Usually they dress as women and are part of a social, religious and cultural community. Ritual castration is sometimes part of the hijra identity. They commonly have sex with men, women and have their own community language, called ulti. Hijra can be married and unmarried and they can wear male dress as well.

Lesbian: A female homosexual

3.5 Safer Sex

Safe sex refers to sexual practices of an individual that protect the Individual and their sexual partner from physical, social, and biological harm. Safe sex practice is essential irrespective of relationship status i.e. among married couple and in premarital and extramarital

3.5.1 Risks of Unsafe Sex: Risks of unsafe sex are described in box-1

Box-1: Risks of Unsafe Sex	
Social Factors • Social stigma associated with pregnancy before marriage • Social stigma for being raped • Social stigma associated with male to male sex	**Biological Factors** • Unwanted pregnancy • Vaginal bleeding due to sex with under aged individual • Anal tearing and bleeding • Tear in vagina • Rape • HIV' infection • STIs and other infection • Sexual assault
Psychological Factors • Fear of sexual assault • Psychological trauma such as after rape	

3.5.2 Prevention of Unsafe Sex

- Avoid premarital and extramarital sex
- Avoid marriage before legal age
- Use condom and other contraceptive measure
- Consider physical build and emotional state of sex partner
- Avoid conditions associated rape sexual assault
- Community mobilization for prevention of rape and sexual assault
- Support victims of rape and sexual assault

34 J Health Popul Nutr, 27(4): 441-451

3.5.3 Safer sex practices include

- Non-penetrative sex
- Penetrative Sex

3.5.3.1 Non-Penetrative Sex

Safer Sex alone or when you have no partner

- Masturbating or stimulating yourself
- Rubbing and caressing your own body
- Fantasizing to reach sexual satisfaction

If you have partner "Safer" Sex means Masturbating or stimulating yourself in front of your partner without contacting each other's sexual fluids rubbing or caressing each other, which can also bring pleasure massaging each other can also be very relaxing and pleasurable.

- Kissing. so long as neither one has an open sore in their mc mouth
- licking partner's skin
- Stimulating partner's genitals with hands (manual stimulation)
- Stimulating the penis between the partner's thighs, or their arm and body

3.5.3.2 Penetrative Sex

Penetrative sex refers to sexual activity, where insertion of a body part or other object into a body orifice, such as-

- vagine
- anus
- mouth

When having vaginal, oral and anal sex

- Use condoms that are still in good condition and not past their expiration date. Follow how to use a condom correctly instead of carefully
- arousal, continue condom wearing throughout period of sexual intercourse, then take it off and discard safely.
- Use condoms for each vaginal, anal or oral sex so that direct contact to body fluids or blood is prevented
- Use a condom when having sex with anyone. Or whenever you have even the 'slightest doubt' of your sexual partner's behavior and sexual history.

Section-4
Comprehensive STI Case Management

4.1 Comprehensive STI case management

Comprehensive STI use management includes all steps essential for identification and correct diagnosis of infection, providing and ensuring treatment, preventing transmission to partner-by-partner notification and treatment and reducing future risk for acquisition of infection by condom promotion and change communication. Comprehensive STI case management includes sharing information with patients clearly and respectfully in a language they can readily understand. Although the time available for establishing a trusting relationship may be limited, effective communication helps the clients to talk more comfortably which saves time.

Comprehensive STI management includes:

- Approach to the patient
- History
- Examination
- Diagnosis
- Treatment
- Education and counseling
- Follow up and referral

4.2 Approach to the patient

The interaction between the patient and health care provider is particularly important in the STI consultation. Unless a mutually respectful and trusting relation is established the information needed to make an accurate diagnosis will not be obtained, the essential education will fail, sexual partners will not be encouraged for treatment and the patient's compliance in treatment will be poor. The **"WELL"** (Box 1) approach might be useful for building an entrusted rapport. The interaction between patient and health care provider depends on the following factors:

4.2.1 The setting

The setting should be as clean, pleasant and comfortable as possible. Audio-visual privacy is essential so that discussion between health care providerand patient cannot be overheard and an examination is not seen by others. A seat must be provided for the patient. Good lighting is necessary for examination. An examination table may be required for examination of a man but certainly required for examination of a woman.

4.2.2 The approach

It is very important to offer friendly behavior and services. If the health care provider (HCP) is perceived as unapproachable, superior and judgmental the history from the patient could be incomplete and/or misleading. The uncomfortable patient will be reluctant to cooperate during examination and less likely to comply with treatment or to follow prevention advice. Hence, following issues are to be taken care with highest priority:

- ***Avoid giving the impression of being in a hurry*:** HCPs often have to work under considerable time constraints. Many patients are to be seen with in short period of time. It will be very difficult, however, to get a cooperative patient if the HCP is in a great rush. Sufficient time must be allowed for all components of case management.
- ***Be confidential*:** STI patients are usually very worried that other people will 'find out'. Assurance of maintaining confidentiality of all information given by the patient is crucial. Assurance is to be emphasized in the beginning of initiating dialogue.
- ***Be tolerant*:** HCP may or may not feel comfortable with patients' action or behavior. The HCP's values may be quite different from those of the patient. This should not influence the attitude towards the patient or the service provided in any way. It is to be remembered always that the role of HCP to cure and comfort, not to judge and never to punish.

Box 1: 'WELL' Approach to STI Case Management

Welcome your patient

Greet patients, offer a seat, and sit near enough to talk comfortably and privately. It is better to sit at right angle to a patient rather than across a desk or table. Ensure confidentiality e.g. say 'anything you tell me will remain confined in this room, it is completely private'. Have a welcoming tone of voice and avoid intimidation with authority.

Encourage your patient to talk

Look at the patient as you talk, ask questions, nod as they speak, say 'huhhuh, achcha, mmm,'hmmm' or 'tell me more about that'. These 'encouragers' show you are listening and are interested.

Look at your patient

Looking at patients helps them to talk more comfortably.

Have a warm and friendly facial expression.

Listen to your patient

Listen carefully to what your patient has to say.

Use the encouragers to show you are interested in their story.

- ***Avoid giving the impression of embarrassment*:** It is usually difficult to talk about sexuality and sexual behavior for cultural and religious reasons. If HCP is embarrassed the patient will be doubly so. The HCP must be professional and be able to talk about sexuality and sexual behavior easily. It is easier to talk to someone of the same sex. So, keeping this in mind patients will be given the opportunity to choose the HCP. It is to consider referring the patients to someone of their own sex if this seems important.

4.3 History

Like any other illnesses, history taking is the key step for diagnosis of STIs. History taking includes both general and sexual history.

4.3.1 General history

- Present complaints (Box 2)
- Personal history
- Occupational history of husband
- Medication and allergy; including current or recent medication and any allergies to medication.
- Patient has received vaccination for Hepatitis B
- Past history of blood transfusion

The symptoms below complaints by patient may indicate the presence of an STI. Patient may spontaneously tell the problem or can be elicited by direct questioning.

4.3.2 Sexual history

Box 2: Common symptoms of STIs

Female general population	***Male general population***
Dysuria, frequency/burning micturition	Dysuria, frequency/burning micturition
Dyspareunia	Urethral discharge
Vaginal discharge	Genital ulceration
Vaginal itching	Skin rash, Lymphadenopathy
Genital ulceration	Abnormal growth or mass in genital parts
Lymphadenopathy	Acute scrotal pain, swelling
Lower abdominal pain	Erectile dysfunction
Abnormal growth or mass in genital part	Psychosexual issues
Fishy odor or Malodor of vaginal discharge	Sore or blister in genital area
Sore or blister in genital area	
Female high-risk behavior	***Male with high-risk behavior***
Dysuria, frequency/burning micturition	Genital ulceration
Vaginal discharge	Urethral discharge
Vaginal itching	Skin rash
Genital ulceration	Lymphadenopathy
Lymphadenopathy	Dysuria, frequency / burning micturition
Lower abdominal pain	Abnormal or mass in genital parts
Abnormal growth or mass in genital pans	Acute scrotal pain, swelling
Sore throat	Erectile dysfunction
Symptoms of viral hepatitis /jaundice)	Psychosexual issues
Skin rash	Constipation
Anal discharge	Diarrhea
Perianal pain	Anal discharge

The **"Five P's"** approach to obtaining a sexual history is one strategy for eliciting information concerning five key areas of interest (Box 3)[35]. However, a few general issues to be considered during history taking such as:

- Sexual history should be taken from every patient attending the clinic.
- It is essential to take a good sexual history. It ensures that you are not making assumptions about the patient.
- Detailed data on sexual practices should be collected once the doctor has established rapport with the patient.
- Privacy should be ensured throughout the consultation.
- Technical terms should be avoided during history taking.
- Ask open ended questions but do not be afraid to be direct to obtain clear answers.

4.4 Examination

While performing ano-genital examination of male or female following general issues to be considered:

4.4.1 General issues

- Ensure privacy.
- Ensure a female attendant if the examiner is male.
- Ask the patient to lie supine on the examination bed.
- Draw the examination curtain around the bed.
- Ask the patient to remove clothing to expose from navel to knees.
- Set up any examination instruments such as speculum, proctoscope while the patient undresses.
- Do not observe patients while they undress.
- Ask the patient if he is ready to be examined.
- Examine the mouth with a torch and tongue depressor for signs of pharyngeal infection.
- Switch on the examination light to illuminate the ano-genital area.

4.4.2 Anogenital examination (Males)

Perform ano-genital examination after preparing the patient. Examine the front part first followed by back part with proctoscopic examination if needed.

35 CDC. Sexually Transmitted Diseases Treatment Guidelines. 2015

Box-3: The Five P's: Partners, Practices, Prevention of Pregnancy, Protection from STIs and Past history of STIs

Partners

"Do you have sex with men, women, or both?"

"In the past 2 months, how many partners have you had sex with?"

"In the past 12 months, how many partners have you had sex with?"

"Is it possible that any of your sex partners in the past 12 months had sex with someone else while they were still in a sexual relationship with you?

Practices

"To understand your risks for STIs, I need to understand the kind of sex you have had recently."

"Have you had vaginal sex, meaning 'penis in vagina sex'?" If yes, "Do you use condoms: never, sometimes, or always?"

"Have you had anal sex, meaning 'penis in rectum/anus sex'?" If yes, "Do you use condoms: never, sometimes, or always?"

"Have you had oral sex, meaning 'mouth on penis/vagina'?"

For condom answers:

If "never": "Why don't you use condoms?"

If "sometimes": "In what situations (or with whom) do you use condoms?"

Prevention of pregnancy

"What are you doing to prevent pregnancy?"

Protection from STIs

"What do you do to protect yourself from STIs and HIV?"

Past history of STIs

"Have you ever had an STI?"

"Have any of your partners had an STI?"

Additional questions to identify HIV and viral hepatitis risk include:

"Have you or any of your partners ever injected drugs?"

"Have your or any of your partners exchanged money or drugs for sex?"

"Is there anything else about your sexual practices that I need to know about?"

A. Examination of the front

- Put on disposable gloves.
- Inspect the exposed skin from umbilicus to knees for altered pigmentation, rashes, scars and lumps.
- Inspect any hair for signs of pubic lice infestations.
- Palpate for inguinal lymph node enlargement and tenderness.
- Inspect the inguinal folds for rashes or lumps.

- Palpate the contents of scrotum for lumps and tenderness. This is achieved by gently cradling each testicle in one.
- Hand while feeling for the epididymis with the fingers of the same hand. With the other hand, gently roll the vas deferens to detect any lumps.
- Inspect the skin along the length of the penis from base to the tip. Note any lumps, rashes or ulcers.
- Retract the foreskin (if present) to inspect for lumps, rashes, ulcers and discharge.
- Inspect the urethral meatus by parting the tip bilaterally. Note any discharge, ulcers or lumps.
- Milk urethra from the base of the penis to tip for the presence of discharge.
- During examination of scrotum palpate both testis or any undesendent testis
- Inspect the penis and scrotum to see any blister or sore

B. Examination of the back

- Ask the patient to turn onto the left side (left lateral position) and to bend both knees and flex the hips to 45º.
- Ask the patient to place their right hand on their right buttock and to draw it upwards. This gives full exposure of the perianal area and allows you to have both hands free for inspection and examination. (You may wish to kneel down or sit on a chair now to save from bending your back.)
- Inspect the buttocks, perineum and perianal area. Note any lumps, ulcers, rashes, scars or discharge.
- Perform proctoscopy where appropriate (see below).
- Remove and dispose gloves. then wash hands with soap and water.
- Ask the patient to get dressed.
- Perform per rectal examination where appropriate.

4.4.3 Anogenital examination (Females)

A. External examination

- Labia and introitus: separate and inspect the labia majora, the inner labia and introitus for warts, herpes lesions, discharge, inflammation of Bartholin's Glands, ulceretic lesion
- See any scratch mark or erosion in and around the vaginal orifice
- Pubic area: inspect for pubic lice, warts, molluscumcontagiosum, blisters and ulcers.
- The perineum, peri-anal region and anus: inspect for lesions such as ulcer, warts, anal fissures, or any discharge etc.

B. Speculum examination

- Select a speculum according to the size of the patient's vagina.
- Lubricate the speculum with clean warm water or water based lubricant.
- Carefully pass a bivalve speculum. The speculum should be passed vertically and directed downwards towards the sacrum. Once the speculum is 2/3rdpassed, carefully rotate and open it. Locate the cervix.
- Note the character of any vaginal fluid, the appearance of the vaginal walls, the appearance of the ecto-cervix and the character of any cervical discharge.

- Test for cervical friability: whether the cervix bleeds on touch.
- Once examination of the cervix and vaginal vault is complete, carefully close the speculum making sure you do not pinch the vaginal mucosa and rotate it to vertical as it is removed from the vagina.
- As the speculum is removed observe the vaginal mucosa.

Note: Palpate for abdominal guarding and rebound tenderness for assessing referral requirement for the patient.

C. Bimanual examination

- The lubricated index and second finger of the right hand are used to gently separate the labia and are then passed into the vagina.
- The anteverted uterus can be palpated by passing the fingers to the anterior fornix with the fingers of the left hand placed over lower abdomen well above the symphysis pubis.
- The retroverted uterus is palpated from the posterior fornix.
- The uterine appendages are examined from the lateral fornices where any swelling may be palpated between the fingers of the two hands.
- Swellings may also be felt in the rectovaginal pouch (pouch of Douglas)
- Cervical motion tenderness is judged by gently moving the ectocervix with the index and middle finger while looking at the face of the patient

4.4.4 Proctoscopy examination (for both male and female)

Proctoscopy examination is indicated for both male and female in case of following conditions:

- a patient has any anorectal signs or symptoms
- a patient had recent unprotected penis-anal sex, oral-anal sex, digital-anal sex
- a female with history of anal sex

Steps for proctoscopy examination

- Ask patient to lie in the left lateral position.
- Smear water based lubricating jelly onto the anal verge and length of the proctoscope.
- Rest the proctoscope at anal verge until the sphincter relaxes, then insert slowly while applying gentle constant pressure. Allow the proctoscope to follow line of least resistance rather than pushing. Generally, aim towards the navel. Elevation and relaxation of the buttocks aids insertion, does asking the patient to "bear down" as if opening the bowels.
- Remove the introducer once the proctoscope has reached its limit.
- With the aid of the patient examination light, observe:
    - colour and texture of rectal mucosa
    - presence of discharge
    - presence of ulceration
    - bleeding
    - lesions
    - wart

- Slowly remove the proctoscope, checking for haemorrhoids and/or other lesions on withdrawal.
- If indicated, with gloved right index finger, perform per rectum examination of prostate and lower rectum.
- Remove and dispose of gloves, then wash hands with soap and water.

4.5 STI diagnosis

Diagnosis of STIs is important because STI rapidly increases from index patient to the communities within sexual network. Also, STI can be associated with acute, chronic and remote illnesses while impacting personal life and socio-economic status of the patient. In addition, higher risk of HIV acquisition is associated with ulcerative STIs.

STs can be diagnosed either by classical approach or by syndromic approach. Classical approach includes etiologic diagnosis and clinical diagnosis. Lab support is needed to identigy the causative agent in case of etiologic diagnosis. However, clinical diagnois is dependant on clinical experience of clinician to best guess the causative agent. Diagnosis of STIs through syndromic approach is used to be done based upon symptoms complained by the patients and the signs that provider finds during examination.

Etiologic diagnosis for STIs are widely done in high-income countries. This approach is especially useful for the diagnosis of asymptomatic infections. However, in low- and middle-income countries, diagnostic tests for making eitiologic diagnosis are largely unavailable. Where testing is available, it is often expensive and geographically inaccessible; and patients often need to wait a long time (or need to return) to receive results. As a result, follow up can be impeded and care or treatment can be incomplete. The only inexpensive, rapid tests currently available for STIs are for syphilis and HIV. The syphilis test is already in use in some resource-limited settings. The test is accurate, can provide results in 15 to 20 minutes, and is easy to use with minimal training. Several rapid tests for other STIs are under development and have the potential to improve STI diagnosis and treatment, especially in resource-limited settings.[36] Eventually, low- and middle-income coutries depend on syndromic approach for STI diagnosis. On the contrary, due to emerging drug resistance, over treatment and asymptomatic infections, there is an ongoing shift from syndromic management to etiological management recommended by WHO.

4.6 Treatment of STIs

Irrespective of approach used for STI diagnosis, treatment of STIs are guided by the following principles:

- Treatment is often single dose
- Administered at the time of diagnosis
- Treatment is based on available susceptibility data
- Partner is often treated to prevent reinfection
- Counselling is provided to avoid future acquisition of infection

36 https://www.who.int/news-room/fact-sheets/detail/sexually-transmitted-infections-(stis)

In Bangladesh, STI treatment is given based upon either one of the three STI diagnosis approaches. But syndromic treatment approach is widely followed in this country due to limited lab facilities and inadequate availability of skilled clinicians who are mostly confined in the tertiary level both public and private health facilities. It is also crucial to remain cautions for selection of antibiotic. Updated knowledge on emerging resistance to antimicrobial agents is one of the key issues for drug selection. However, drugs selected for treating STI should meet the following criteria:

- High efficacy (at least 95%)
- Low cost and available
- Acceptable toxicity and tolerance
- Organism resistance unlikely to develop or likely to be delayed
- Single dose
- Orally administered
- Not contraindicated for pregnant or lactating women

Recommended treatment for different STIs syndrome: Please see Section 5.

Recommended treatment for different STIs based on etiology: Please see Section 6.

4.7 STI health education and counseling

Counseling and health education have much in common but these are not the same. Both processes (a) aim at changing behaviors to reduce risk, (b) use two-way interactions between provider and client, and (c) rely heavily on communication skills. However, there are certain differences between counseling and health education, e.g. (a) counselling is usually initiated by a client who needs help while health education is usually initiated by the educator, (b) counselling is primarily a coping process in which the client is helped to decide regarding a problem situation or make a choice. (c) Counseling aims to reduce stress by means of a dialogue with the client whereas health education aims at the dissemination of information and (d) counseling is usually done in a one-to-one situation or in very small groups while health education is usually for a small group or larger audience. The general differences between health education and counseling is portrayed in Table-1.

Table 1: General difference between health education and counseling

Health education	Counseling
Not confidential	Confidential
For a group of people	One to one process or a small group
Information is provided to increase the knowledge	Facilitate change in attitude and motivates behavior change
Content oriented	Problem oriented
Based on public health needs	Based on needs of clients

The doctor should intiate STI counseling and/or health education as soon as patient is diagnosed with STIs. As appropriate doctor should briefly discuss 4 Cs with all patients with STI diagnosis. Then counselor should spend more time and provide detail information about 4 Cs. It is crucial to advocate and refer such patients for HIV testing services from the nearest center.

In regards ot STI/RTI management, health education is the provision of essential information related to the prevention or treatment of STI/RTI and need not take much time. Counselling, on the other hand, requires time to establish trust, assess the person's individual situation, and relate prevention information directly to the person's life (Table-2).

Table-2: Difference between health education and counseling for STI/RTI management

Health education			Counselling
To raise awareness	*For prevention*	*As part of STI/RTI management*	
Talk about STIs/RTIs and complications	Promote correct and consistent condom use	Emphasize compliance with treatment	Discuss risk and vulnerability Examine barriers to prevention Discuss solutions and build skills for safer sex Make a plan and follow up
Explain about symptoms and how to recognize them	Encourage fewer sex partners	Promote condom use (including during treatment to prevent reinfection)	
Promote early use of services	Support delay in starting sex (for young people)	Encourage referral of partners for treatment	

4.7.1 STI Health education

It is a process that informs, motivates and helps people to adopt and maintain health practices and life styles, advocate environmental changes as needed to facilitate this goal and conducts professional training and research to the same end. STI health education aims to:

- Inform the patient about the nature and possible consequences of any infection(s) identified.
- Inform how to avoid re-infection.
- Inform how to recognize symptoms and the importance of early treatment seeking for STI.
- Advice on seeking HIV testing services for HIV high risk patients.

4.7.2 STI Counseling

Counselling is a helping process where one person explicitly and purposefully gives his/her time. Attention and skills to assist the client to explore their situation, identify and act upon solution, the limitations of their given environment. STI counseling aims to:

- Identify and deal with issues that may cause the patient anxiety or distress, e.g. informing the partner spouse about the infection; leaning about and coming to terms with complications such as infertility; coping with chronic, incurable infections such as herpes, HIV or genital warts; feelings of guilt.
- Assess the actual and self-perceived HIV and STI risk.
- Help the client to recognize barriers to risk reduction.
- Negotiate an acceptable and achievable risk reduction plan.
- Support patient initiated behavior change.

Components of STI counseling

In syndromic management of STI, it is important that patients receive STI counseling on ***"Four Cs"*** after seeing the doctor because:

- A patient who is at an STI clinic and has just had an STI diagnosed is generally at their most receptive phase for education. They now have proof that it can happen to her/him, not only to others.
- If the patient is not educated, there is a higher risk of her/him transmitting the infection to other partners.
- A patient can only receive appropriate advice on compliance once the doctor has prescribed medication.
- Contact tracing can only be effectively pursued if the patient has had an STI diagnosed by the doctor.
- The counsellor may need to clarify some issues the patient discussed with the doctor.
- Discussion about the patient's infection will enhance their trust and co-operation with health care workers.

The following 4Cs are must for educating and counselling the patients and/or their partner(s):

A. Compliance with treatment

B. Counselling for prevention

C. Condoms, with demonstration of correct use

D. Contact tracing and treatment

Box 4: Key messages

Every' patient suffering from STI must receive and understand the following messages:

- Sexual contact is the usual cause of the disease
- Without treatment STI may cause severe complications
- The mode of transmission of STI and HIV
- STI augments the risk of HIV transmission
- The mother of baby with neonatal conjunctivitis should know that she is the source of her baby's infection

There is no standard order in which these messages should be delivered. However, patients tend to be most responsive to messages related to their cure. Followed by the treatment of those close to them, for instance a spouse. There is often a lack of interest in discussing the long-term consequences of STI, especially the risk of acquiring or transmitting HIV and the behavioral changes required for preventing its spread.

A. Compliance with Treatment:

Compliance of treatment is important for a successful STI intervention program. Emphasize the importance of completing all the treatment. Ensure the patient knows when to return for follow-up or check-ups. Ensure the patient IS clear about the reason for referral to specialist services and how to get to the referral centre. Advise patient about the importance of taking effective drugs by the healthcare for STI and medicines that are prescribed by traditional healers or pharmacists are not effective treatment for STIs.

Reasons for Non-compliance:

- Patient does not understand the instructions
- Treatment schedule is too complicated
- Drug(S) are too expensive: patients may not want to purchase the full treatment or may save some for 'next time'
- Symptoms have resolved so patient stops treatment
- Unpleasant side effects

B. Counseling for Prevention

Good STI counseling should include:

- ***Welcome***: Make patients feel welcomed and respected
- ***Inform***: Keep oneself well informed to be able to provide good treatment and accurate information to the patients
- ***Listen***: Listen carefully to what a patient says
- ***Understand***: Understand the feelings, experiences and point of view of a patient. including barriers to change
- ***Show respect***: Respect the confidentiality and dignity of the patients; provide privacy for the patients.
- ***Overcome discomfort about sexuality***: Try to become comfortable with your own sexuality, with sexual behavior and with sexual words. Feeling at ease while talking about a sexual matter allows a patient to communicate better with the service
- ***Decision-making aid***: Help a patient to make decisions to solve his/her RTI/STI problems.

Steps of Counseling RTI/STI Patients

i) Make your patient feel at ease

- Greet the patient in a friendly manner
- Use your eyes: look at the person in the face to show you are interested in what he has to say
- Make sure that your body gives the same friendly, relaxed message as your words
- Speak a language in which patients can talk as easily as possible about sexual issues
- Use words the patient can understand
- Ask the patient's permission to bring up personal questions
- Avoid insisting on a sensitive subject if the patient is reluctant to answer

ii) Inform your patient about his/her STI, its implications and treatment:

Patients need to understand how to get over their current STI and prevent getting another one in the future. The following information should be provided to STI patients:

- Complete the full treatment
- Take care not to spread STI and HIV: Avoid sex during treatment otherwise partner may be infected. If sex cannot be avoided, use condoms
- Help your husband and partner to get treatment
- Follow up visit for assessment of the condition
- Practice safer sex: a) sex with mutually faithful partner who is not infected, b) correct and consistent condom use, c) penetrative sex and abstinence and d) early and effective treatment seeking behavior
- Protect your baby: look for STI in the first trimester of pregnancy

iii) Help your patient trace sexual partners:

Always tell the patients how important it is to treat partner(s). Ask them how can help them bring their partners in for treatment. The patient may be the index case: the only one who can tell where the infection came from.

iv) Assess your patient's risk level:

- For assessing your patient's risk level, ask about five different areas:
- Personal sexual behavior: Sexual partner in the past year and past history of any other STI
- Other personal risk factors: Blood transfusion and needle sharing
- Partner(s) sexual behavior: Signs and symptoms of STI, sex with other partner and drug use.
- Personal drug use: Alcohol and other substance use
- Patient's protective Practice of safer sex

v) Identify any barriers to changing risky behavior:

Changing risky sexual behavior is difficult because it is extremely personal, private and satisfying. It is formed by a combination of various factors like; physical structure, gender, culture, religion, economic background, character, principles, personal factors and environment. Most sexual activities are habitual; they are automatic and take place without the person having to think a great deal. It is necessary to understand the patient's sexual behavior if one wants to change risky behavior. Therefore, counseling should be appropriate to the patient's nature and behavior.

vi) Inform your patient about his/her risk level:

The counselor's job is not to change a patient's behavior directly but to give information about his/her risk level, identify barriers that might interfere with his/her attempts to change and to help deal with those barriers. It is critical to find a balance between fear arousing and fear reducing messages.

vii) Help your patient to plan changes in his/her behavior:

There are a number of techniques to help the patient in change his/her behavior.

- Focus on the immediate benefits to the patient
- Replacing a risky practice: Advise patient for a) safer sex practice, b) knowing the signs and symptoms of STI and treating them promptly, c) seeking treatment for drug addictions, d) avoiding any body piercing (involving the use of shared instruments) e) seeking health care at a facility where needles and skin piercing instruments are properly sterilized, and f) helping your patient to deal with any barriers.

C. Condoms

To minimize the spread or transmission of STI or HIV in future it is important to educate all clients to use condoms correctly and consistently.

- Emphasize and explain the importance of condom use
- Explain the importance of condom use for dual protection; prevention of STIs and contraception
- Explain and demonstrate how to use condoms (male and/or female) and ask the patient to demonstrate
- Provide some condoms (need based)

Advantages of condom use are:

- Prevents STI including HIV
- Prevents unwanted pregnancy
- Feels more secure
- Shows care for partner
- Saves the cost and embarrassment of seeking treatment for STI
- Can add eroticism to foreplay
- Slows down ejaculation and thereby prolongs pleasure

Disadvantages of condom use are:

- Requires advance planning
- Can interrupt love making
- Can tear or slip off
- Costs money
- Slows ejaculation
- May be less enjoyable
- A few individuals are allergic to latex

Steps of using male condom (Annex 1)

Figure 1: Condom for prevention of STIs and HIV

D. Contact tracing and treatment:

- Help the patient to understand the importance of contact tracing and treatment.
- Provide partner notification referral cards
- Explain why contact tracing and partner management is an important part of STI case management

Section-5
Syndromic Approach of STI Management

5.1 Syndromic approach of STI Management

Syndromic management of STI was developed and advocated by in 1993 and since then many countries in the world have adopted the syndromic approach for STI management. Based on extensive evaluation of different algorithms in syndromic management in different countries, WHO revised and published new guidelines in 2003.[37] And, WHO is in the process of updating the 2003 guidelines. Over 90% of countries use syndromic management in most regions, with the exception of the European Region, where the greater availability of laboratory resources allows for the use of etiological diagnosis.[38]

Taking into account the advantages of syndromic management approach Bangladesh has been implementing syndromic approach since 1999 by adopting the WHO generic guidelines to serve as a national guideline for the management of STIs.

Table-1 Difference between Symptoms, Sign and Syndrome

Symptoms	Sign	Syndrome
Symptoms are complaints that a patient brings to a health care provider.	Signs are the clinical presentation of a disease identified in a patient after examination by a service provider	A syndrome is a collection of symptoms associated with the infection presented by the patient, including signs observed by the service provider during examination of the patient.

Rationale for Syndromic Management

Evidence shows that STIs are quite prevalent in Bangladesh. Bangladesh has an extensive health and family planning program throughout the country. The lowest level of static service delivery center is Community Clinics and the Health and Family Welfare Center (H & FWC) or primary level NGO static clinic in the rural areas. At this level, where most of the service providers are paramedics (FWVs, nurses, medical assistants, etc. trained to provide an essential services package (ESP)). Existing manpower and logistics are not sufficient for etiological and clinical approaches to STI diagnosis. On the other hand, the achievement of a STI control program depends largely on the successful management of STI patients at the first point of encounter with the health care system. Considering limitations in logistics and skilled manpower and the extent of services required for the population, syndromic management is the recommended option.

37 WHO. Guidelines for the management of Sexually Transmitted infections. 2003, Geneva.

38 Report on Global Sexually Transmitted Infections Surveillance -2015.

Flow Chart for Syndromic Management

STIs are caused by a variety of etiological (infectious) agents although signs and symptoms of most STIs are similar. Most signs and symptoms of STIs can be grouped under few syndromes. Based on these syndromes, sets of standard syndromic flowcharts have been developed (Figure-1). These flow charts take into account the most common etiologies of STIs. Each flowchart is broadly made up of a sense of three steps, these are:

- The **clinical problems** (the patient's presenting symptom) or risk behavior

  A **rectangular box** with thin margin indicates complaints
- The **decision** that needs to be taken

  A **polygonal box** with ***thin line*** indicates treatment decision
- The **action** that needs to be carried out including referral

  Rectangular with ***thick margin*** indicates treatment or management

The flow charts called "algorithms" are in fact decision and action trees. It is like a map that guides health worker through a series of decisions and actions. The flow chart ends with an instruction on how to manage the patient (or in a few cases, an instruction to refer the patient). Each decision or action is enclosed in a box one or two routes leading from it to another box, with another decision or action. Algorithms and treatment recommendations are available for each of the syndromes. Combined treatment is to be provided if more than one syndrome is present.

Benefits of the flowcharts include:

- ***Promptness of treatment,*** because STI services can be made available at any first-line health facility. Patients are thus treated at their first visit.
- ***Wider access to treatment,*** since treatment is available at more health centers, reaching a wider population.
- ***Opportunities for introducing preventive and promotional measures*** such as youth education and condom distribution.

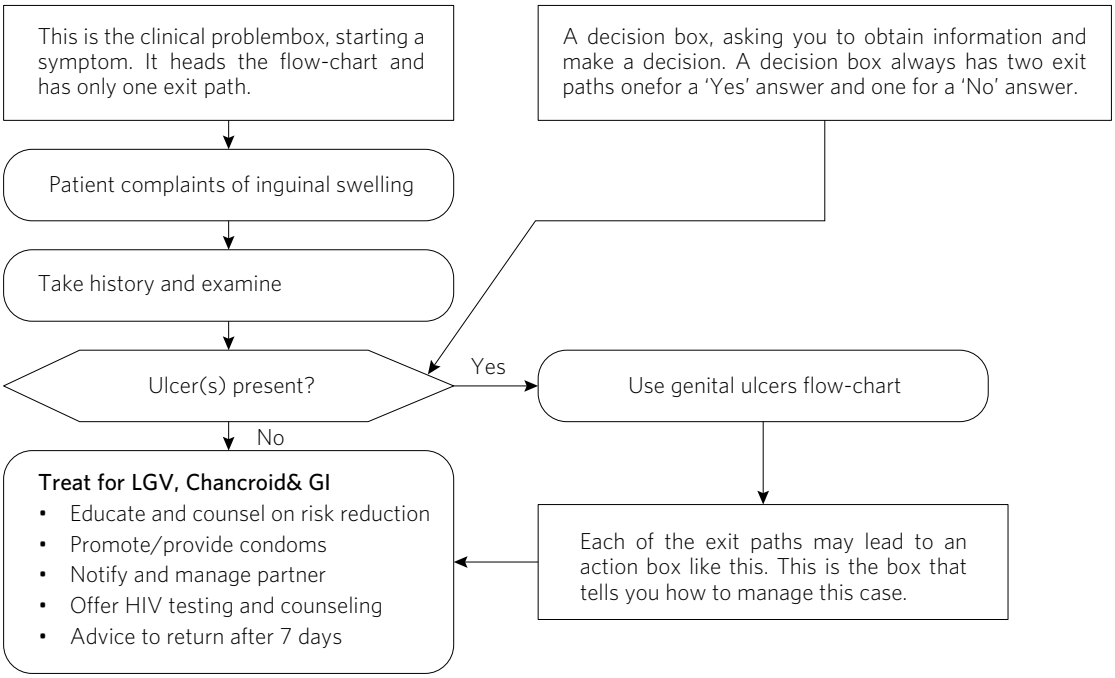


Figure 1: Example of syndromic management flowchart

Evaluation of syndromic management

Syndromic management of STI has been evaluated among urban and rural females from the general population and females with high-risk behavior (Hotel- based sex and brothel-based sex workers).

- **Syndromic management in females from general population**

  Hawkes et al., in 1995 evaluated Syndromic management among females attending at PHC delivery units in Matlab and showed that currently available syndromic management has a low sensitivity and specificity for cervicitis.[39] Subsequently two studies were conducted on the evaluation of syndromic management among urban women attending PHC units with and without complain of vaginal discharge. Bogaerts et al., 1999 have shown that currently available Syndromic management for vaginal discharge causes 98% over treatment for cervicitis.[40] Rahman et al 2001 have conducted an evaluation of vaginal discharge syndrome of syndromic management and documented a 96% over treatment for cervicitis.[41]

- **Syndromic management in females with high-risk behavior**

  Two studies have been conducted to evaluate the syndromic management among hotel-based and brothel-based sex workers. These studies were designed to evaluate syndromic management with and without using a speculum. It has been shown that syndromic management causes 53% under treatment if a speculum is used and 43% (Figure: 2) under treatment without a speculum. The sensitivity and specificity of syndromic management remained unacceptably low (sensitivity 68-86% and specificity 25-52%) irrespective of speculum use.

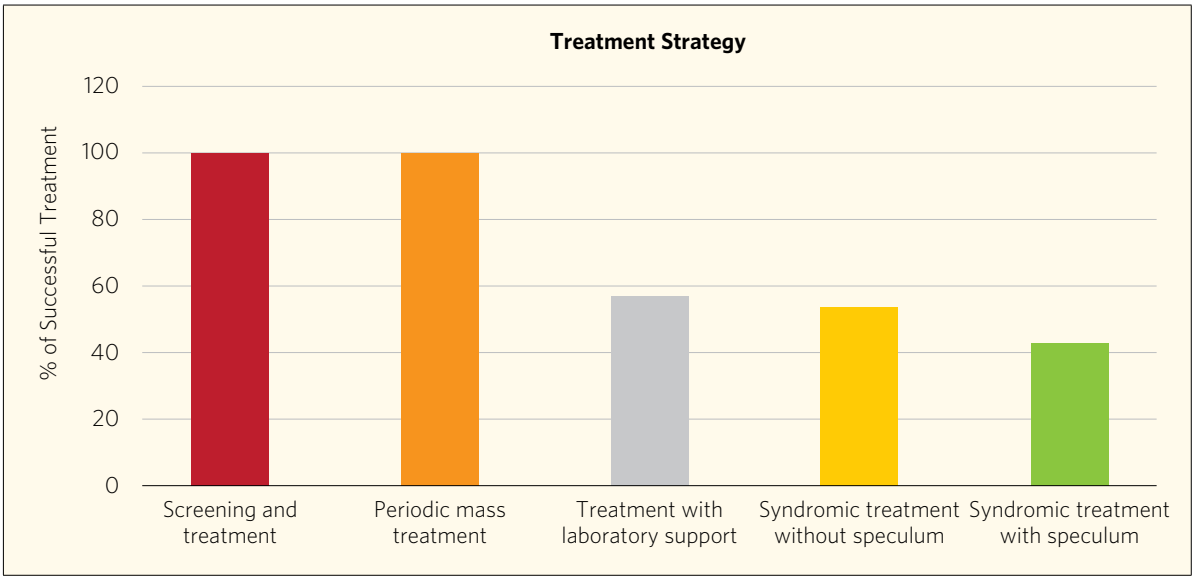


Figure 2: Evaluation of syndromic management in females with risk behavior

- **Evaluation of syndromic management in males with urethral discharge**

  Although it is known that syndromic management works reasonably well in male urethral discharge, the evaluation data is limited. Our preliminary data indicates that treating N. gonorrhoeae and C. trachomatis only cures 75% of the cases while 25% of infections with other pathogens such as *T. vaginalis* and *M. genitalium* remained untreated.

39 Hawkes s. et al. Reproductive tract infections Sex Transm Infect, 2001.77(5): p. 344-50.

40 Azim, T. et al., Injecting drug users in Bangladesh: prevalence of syphilis, hepatitis, HIVand HIV subtypes. Aids, 2002.16(1): p. 121-3.

41 Hawkes, S., et al., Reproductive-tract infections in uomen in low-income, low-prevalence situations: assessment of Symptomatic management in, matlab, Bangladesh. Lancet, 1999.354(9192): p. 1776-81.

- **Asymptomatic infection**

  Asymptomatic infection among females is one of the major infections of syndromic approach. The prevalence of asymptomatic infection was evaluated among females with high risk behaviors. It has been shown that almost half of gonococcal and chlamydial infections in females are asymptomatic.

5.2 Common Features of STIs

5.2.1 Common Clinical Features of STI

Syndromic management of STI is based on syndromes (a collection of symptoms associated with infection) presented by a patient and signs observed by the service provider during examination of the patient. STIs may cause symptoms and signs in the reproductive organs, as well as in the skin around vagina, penis and anus or in the throat or mouth. Some STIs may cause systemic symptoms and signs, some STIs are asymptomatic in many occasions, especially in women. It is therefore important to conduct a thorough clinical examination for implementation of syndromic management.

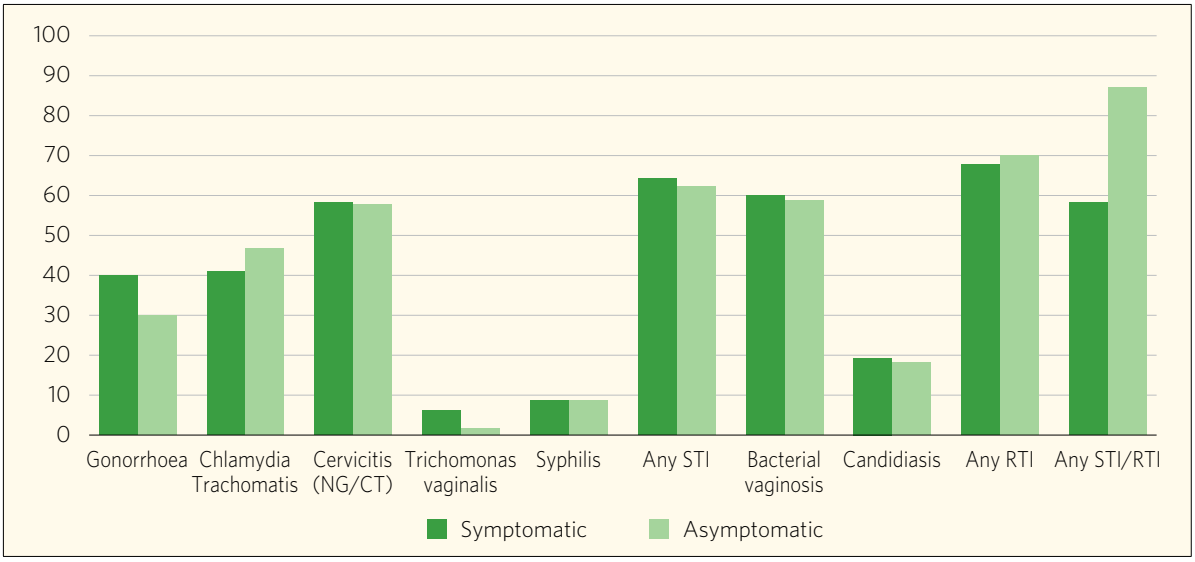


Figure 3: Prevalence of symtomatic and asymtomatic infection among hotel based female sex workers in Dhaka

Common Symptoms of STIs

- Discharge from genitals (vagina/urethra)
- Pain and burning sensation during urination
- Pain during sexual intercourse
- Sores or blisters in the genitals
- Lower abdominal pain
- Inguinal swelling and or ulceration
- Genital ulcers
- Rash in the body including in sole and palm
- Scrotal swelling and pain
- Severe itching on vulva or vaginal orifice

Common Signs of STIs:

- Frank urethral discharge or discharge on milking
- White, yellow, yellowish green or creamy vaginal discharge
- Curd like vaginal discharge
- Foul smelling vaginal discharge
- Cervical discharge
- Cervical motion tenderness
- Painless or painful genital ulcer
- Rash, blister or red swollen genitals
- Swelling of testes
- Inguinal bubo

Although all infections result in some symptoms, in STI some infections produce minor symptoms that may easily be overlooked by a patient. Asymptomatic STIs are one of the major concerns for STI management using syndromic management. Asymptomatic infections are more common in women.

Table-2: Prevalence of different asymptomatic STIs in men and women:

Among men	Among women
Gonococcal infection:10%	Gonococcal infection:60%
Chlamydial infection:50%	ChlamydialInfection:80-90%
T. vaginalis:50%	T. Vaginalis:50%
	Bacterialvaginosis:50%

Asymptomatic patients are potentially more dangerous as they

a. Do not seek treatment due to lack of physical discomfort
b. Perceive false security
c. Less motivated for condom use
d. Transmit infection to partner(s) for a longer period of time
e. Develop complications
f. Infected mother can transmit the infection to the fetus

5.2.2 Common Syndromes of STI

STIs are caused by a variety of organisms. Although the aetiology is different, many STI produces common syndromes and constitutes the basis for syndromic management of STI (Table-3). The common Syndromes of STI are:

A. Characterized by Urethral/Vaginal/Anorectal/Pharyngeal Discharge
    i. Urethral Discharge Syndrome
    ii. Vaginal Discharge Syndrome
    iii. Anorectal/Pharyngeal Discharge
B. Characterized by Genital, Anal, or Perianal Ulcers
    i. Genital Ulcer Syndrome
    ii. Anorectal/Oropharyngeal Ulcer Syndrome
C. Lower Abdominal Pain

D. Scrotal Swelling
E. Inguinal Bubo
F. Neonatal Conjunctivitis

Table-3: Signs and symptoms most common STI syndromes and their aetiologies

Syndrome	Symptoms	Signs	Aetiology (common)
Urethral discharge (UD)	Urethral discharge Painful urination Frequent urination	Urethral discharge (by milking of urethra)	Gonorrhea Chlamydia
Vaginal discharge (VD)	Vaginal discharge (Profuse, foul smelling) Vaginal itching Painful urination Painful intercourse	Vaginal discharge Endocervical discharge Friability of cervix	Vaginitis: Trichomoniasis, Candidiasis, Bacterial Vaginitis Cervicitis: Gonorrhea Chlamydia
Anorectal/Pharyngeal Discharge	Anorectal/Pharyngeal discharge Diarrhoea/ blood in stool/lower abdominal cramp with history of unprotected anal sex	Anorectal discharge Pharyngitis with history of unprotected oral sex	Gonorrhea Chlamydia
Genital ulcer (GU)	Genital ulcer Swelling and or ulceration in inguinal region	Genital ulcer Enlarged inguinal lymph nodes	Syphilis Chancroids Genital Herpes
Anorectal/ Oropharyngeal Ulcer Disease	Anorectal/oropharyngeal sore or ulceration	Blister/vesicles/ ulcers in anorectal/ oropharyngeal region	Syphilis Chancroids Herpes
Lower abdominal pain (PID)	Lower abdominal pain Painful intercourse	Vaginal discharge Lower abdominal tenderness Cervical motion tenderness	Gonorrhea Chlamydia Mixed anaerobes
Scrotal swelling (SS)	Scrotal pain Swelling of the scrotum	Scrotal tenderness Enlargement of the scrotum	Gonorrhea Chlamydia
Inguinal Bubo (IB)	Painful, enlarged lymph node at inguinal region Fluctuation Abscess or Fistula	Swollen, tender inguinal lymph nodes	LGV Chancroids
Neonatal Conjunctivitis (NC)	Swollen eyelids Discharge Baby cannot open eyes	Oedema of the eyelids Purulent discharge	Gonorrhea Chlamydia

Screening of STI Cases for HIV[42]

All persons who seek evaluation and treatment for STDs should be screened for HIV infection. Screening should be routine, regardless of whether the patient reports any specific behavioral risks for HIV infection. Persons at high risk for HIV infection with early syphilis, gonorrhea, or chlamydia should be screened at the time of the STD diagnosis, even if an HIV test was recently performed. Some STDs, especially rectal gonorrhea and syphilis, are a risk marker for HIV acquisition.

A. Common Syndromes of STIs Characterized by Urethral/Vaginal/Anorectal/Pharyngeal Discharge

i. Urethral Discharge Syndrome (UDS)

Urethral discharge is the presence of abnormal secretions from the distal part of the urethra and it is thecharacteristic manifestation of urethritis. Urethritis is usually due to STIs althoughUTIs (urinary tract infections) may produce similar symptoms. Urethral discharge is one of the commonest STIs among men in our country.

Causes of Urethral Discharge Syndrome

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- *Trichomonas vaginalis*
- *Mycoplasma genitalium*
- *Ureaplasma urelyticum*

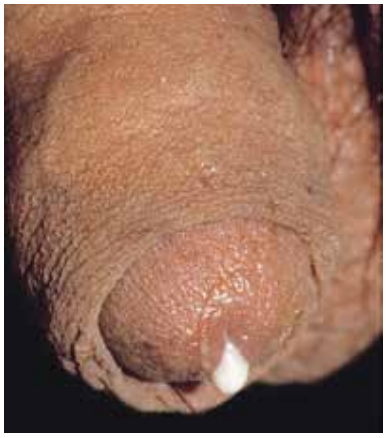


Figure 4: Urethral Discharge

Signs and Symptoms:

- Urethral discharge (Figure-4, frank or only visible after milking urethra)
- Painful urination
- Frequent urination and burning during urination
- Urethral itching
- Urethral discharge can be associated with scrotal pain and swelling

Consequences:

- Urethral stricture and periurethral abscess
- Epididymitis leading to decreased fertility or sterility
- Transmission of infection to female partner (who is often asymptomatic) and subsequent re-infection
- Increases a risk for acquisition of HIV due to inflammation, ulcer in urethra and availability of lymphocytes in the local tissue of HIV uninfected patients
- Releases more HIV virus particles if the patient is co-infetced with HIV

42 CDC STI Guideline 2015

Management of Urethral Discharge Syndrome

History:

- Duration and nature of urethral discharge
- Duration of burning sensation or pain during urination
- HIstory of sexual behaviour and recent exposure

Physical Examination:

Inspection of genital organs including the interior part of the prepuce and the covered part of glans penis and look for urethral discharge (milk urethra, if necessary)

Check for other STIs, if necessary does a proctoscopy.

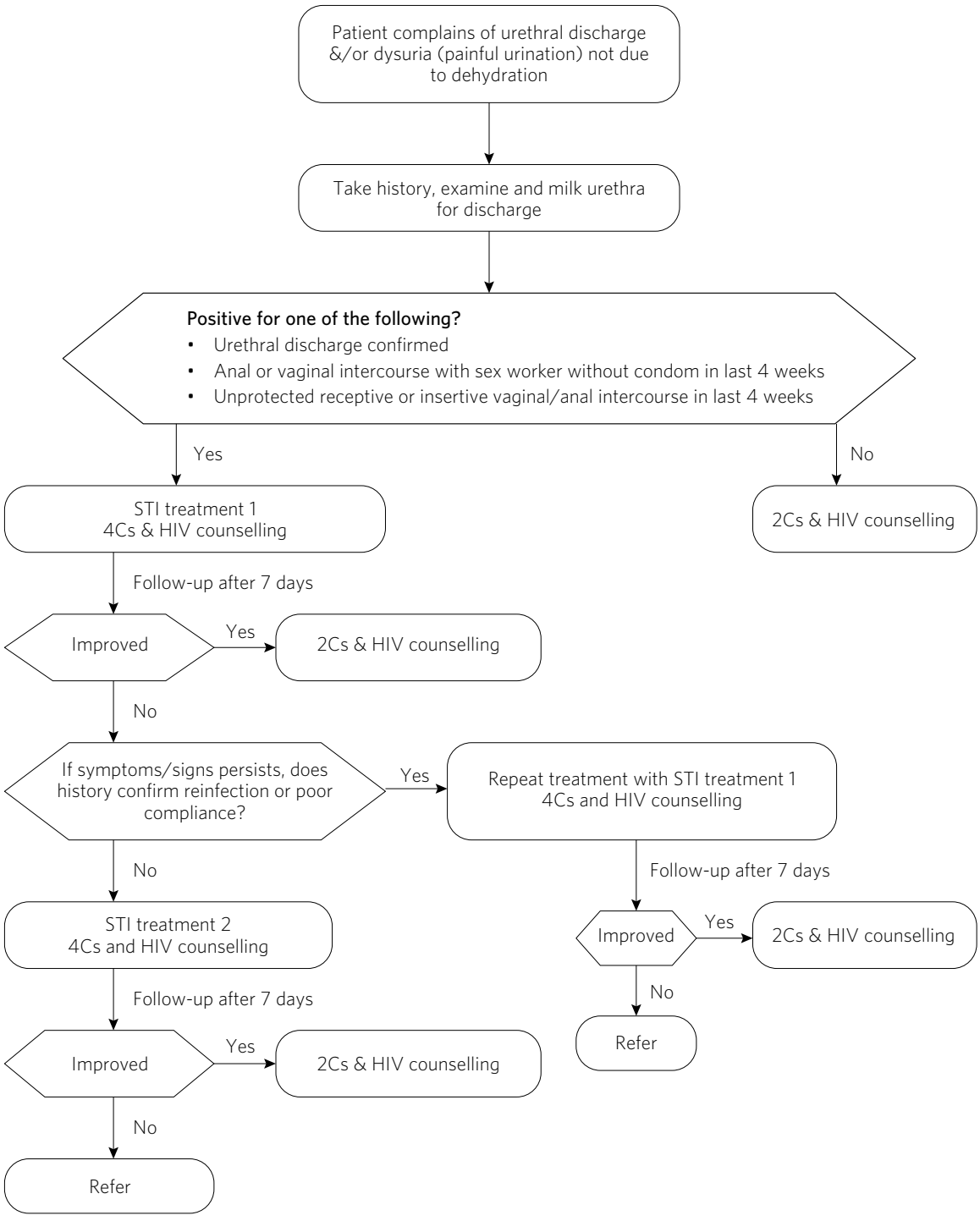
Urethral Discharge Syndrome Management flowchart for Males from General Population

The entry point for the flow chart is any painful urination or urethral discharge. Treatment for chlamydial and gonococcal infection is based on risk assessment after history and examination.

The risk assessment criteria comprise:

- Urethral discharge confirmed
- Unprotected vaginal or anal intercourse with a sex worker in the last 4 weeks
- Unprotected receptive and/or insertive anal intercourse in the last 4 weeks

Syndromic Management Flowchart for Urethral Discharge in Male from General Population



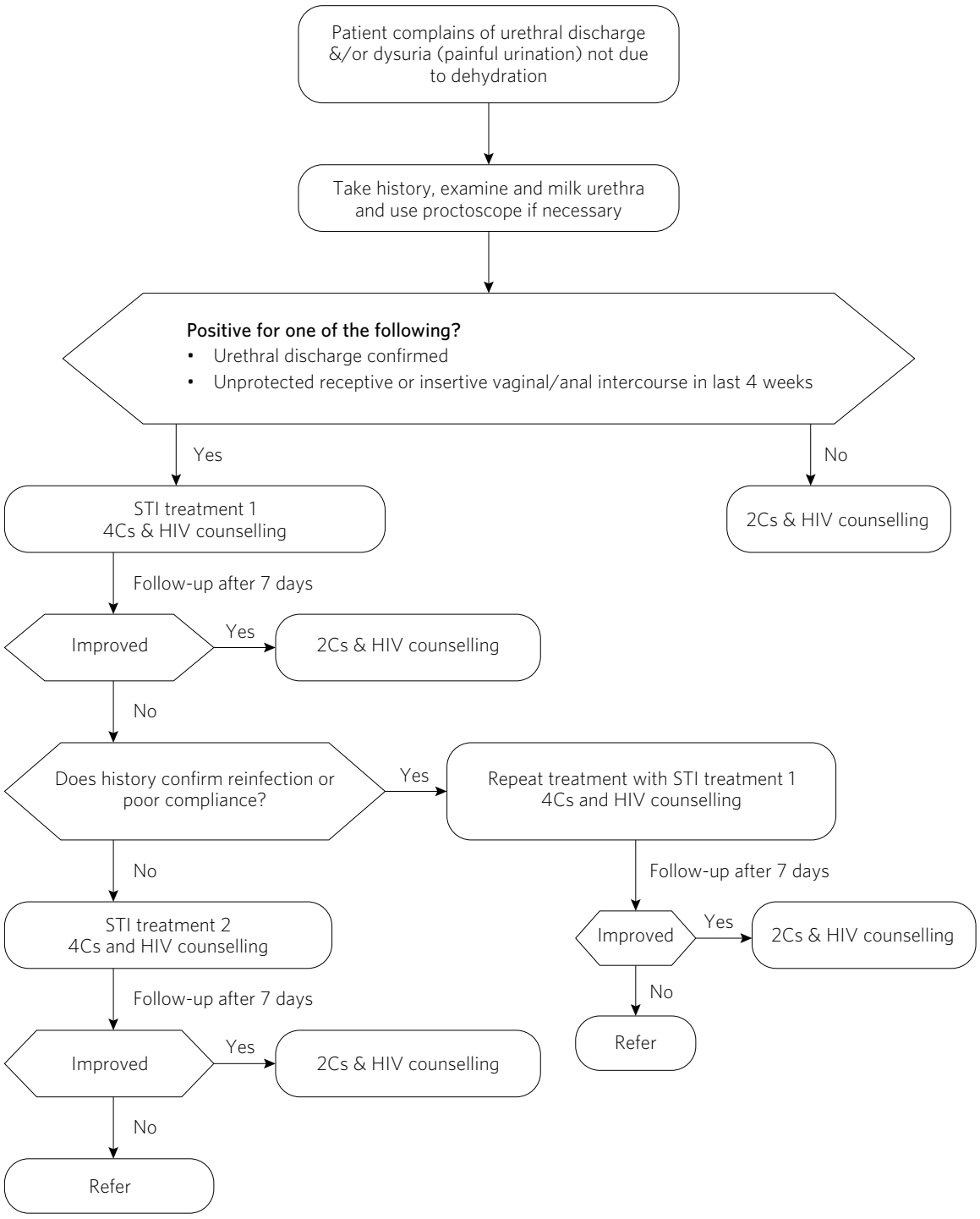
Urethral Discharge Syndrome Management Flowchart for Male from Key Population

The entry point of the flow chart is any painful urination and urethral discharge. Treatment for Chlamydial and gonococcal infection to be provided based on a risk assessment after history taking and necessary examination. This mean that male from key population may be treated for urethral discharge syndrome even if no urethral discharge is demonstrated.

The risk assessment criteria for Key Populations-

- Urethral discharge is confirmed
- Unprotected vaginal or anal intercourse with a female sex worker in the last 4 weeks
- Unprotected receptive and/or insertive anal intercourse in the last 4 weeks

Syndromic Management Flowchart for Urethral Discharge in <u>Male from Key Population</u>



Treatment of Urethral Discharge Syndrome

Treatment for the Patient[43]:

STI treatment 1:
Ceftriaxone: 250mg by intramuscular injection, as a single dose; or
Cefixime: 400mg orally, as a single dose

PLUS
Azithromycin 1 gm orally; or
Doxycycline* 100mg orally 12 hourly for 7 days; or
Erythromycin base 500 mg orally 6 hourly for 7 days

STI treatment 2:
Metronidazole* 2gm orally as a single dose; or
Metronidazole 500mg 2 times daily for 7 days; or
Tinidazole 2gm orally in a single dose

**Note: Doxycycline not to be prescribed for partner, if she is pregnant or lactating. Metronidazole not to be prescribed for females in 1st trimester of pregnancy.*

Treatment for Partner[44]: (for all partners having unprotected sex within last 60 days of diagnosis)

Same treatment to partner(s)

Advice: Abstain from unprotected sex for 7 days following patient &partner have completed treatment/resolution of symptoms

Persistent or recurrent urethral discharge

Persistent or recurrent urethral discharge symptom may be due to

1) Re-infection from regular partner or new partner,
2) Resistance to drug(s),
3) Non-gonococcal non-chlamydial urethritis mainly due to *T. vaginalis* and
4) Non-compliance to treatment.

Referral

If UDS case is not improved or worsens after the 7 days follow up using appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/individual specialist for further management.

43 WHO 2016 &CDC STI Guideline 2015

44 CDC STI Guideline 2015

ii. Vaginal Discharge Syndrome (VDS)

Vaginal discharge is the most common gynecological complaint of women in Bangladesh. A healthy woman may have a variable amount of clear and white discharge from her vagina which is called Physiological Discharge. The Physiological discharge usually increases before and after menstruation and becomes more thin/clear when a woman is in the middle of her menstrual cycle. It also increases during pregnancy, taking oral contraceptive pills (OCP) and when an IUD is in place.

Vaginal discharge is considered pathological when there is a change in the quantity, consistency, color or smell with symptoms such as irritation & itching in the genital area; external or internal burning when passing urine; intermenstrual bleeding; or pain during intercourse (dyspareunia).

The most probable cause of a women complaining of vaginal discharge is vaginitis. Cervicitis is a less frequent cause of vaginal discharge, but the complications of untreated cervicitis are much more serious. Not all infections of the female reproductive tract are transmitted through sexual contact. In fact, the common infections i.e. candidiasisand bacterial vaginosis are not usually sexually transmitted.

Causes of Vaginal Discharge Syndrome:

Physiological (Normal) Discharge:

Physiological vaginal discharge is normally clear, white, odorless, does not cause itching, burning or any other discomfort.

Discharge due to Vaginitis:

- Trichomonas vaginalis
- Pathogens associated with bacterial vaginosis
- Candida species

Discharge due to Cervicitis:

- Neisseria gonorrhoeae
- Chlamydia trachomatis

Symptoms of Vaginal Discharge Syndrome:

- Increased vaginal discharge
- Can be associated with vaginal irritation, itching and soreness
- The discharge may be foul smelling and could be yellow of greenish in color
- May be associated with painful micturition and dyspareunia
- Curd like vaginal discharge

Signs of Vaginal Discharge Syndrome:

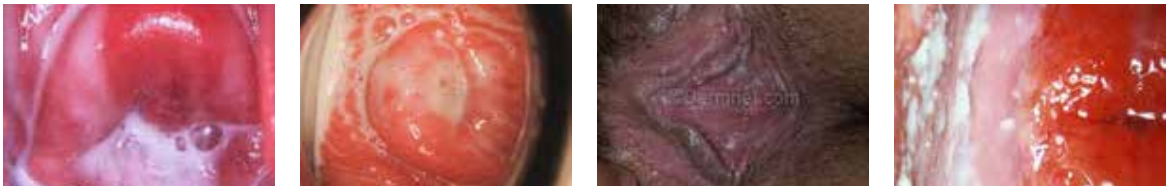
- Visible discharge coming out of vagina during inspection
- Presence of thick homogenous discharge during speculum examination
- The discharge may be foul smelling
- There may be discharge, friability and ulcer in cervix

During speculum examination, it is possible to identify the origin and nature of discharge and diagnosis can be made accordingly-

- **Cervicitis** is diagnosed if there is endocervical discharge and friability of cervix (bleeds easily on gentle touch and swab) or behavioral and clinical assessment is positive
- In **trichomoniasis and bacterial vaginosis**, profuse watery, foul smelling and frothy vaginal discharge is seen
- **Candidiasis** is diagnosed if curd like vaginal discharge is found
- When associated with **lower abdominal pain**, it is advised to follow the PID/LAP flow chart

In absence of advanced laboratory tests, it is not possible to make a reliable distinction between gonococcal and chlamydial cervicitis, because-

- Coexistence of gonococcal and chlamydial infection is common and sign/symptom overlap
- Cervical infections are frequently asymptomatic



Bacterial vaginosis discharge | Tricomoniasis | Valvovaginal candidiasis | candidal discharge

Figure-6: Discharges in vaginal discharge syndrome

Consequences of Vaginal Discharge

- Pelvic inflammatory disease
- Infertility
- Ectopic pregnancy
- Premature rupture of membrane (PROM) in case of pregnant women
- Chorioamnionitis
- Neonatal infections

Management of Vaginal Discharge Syndrome in Females from General Population

Vaginal discharge is a common complaint among women attending RTI/STI services at primary health care units. Therefore, it is recommended that women from general population with complaints of vaginal discharge should be treated primarily for vaginitis and not cervicitis, especially where no speculum examination is available.

Syndromic Management Flowchart for Vaginal Discharge Syndrome

The entry point for the flowchart is the complaint of vaginal discharge. Treatment for chlamydial and gonococcal infection is based on new risk assessment after history and examination. To confirm the syndrome, do the following:

History:

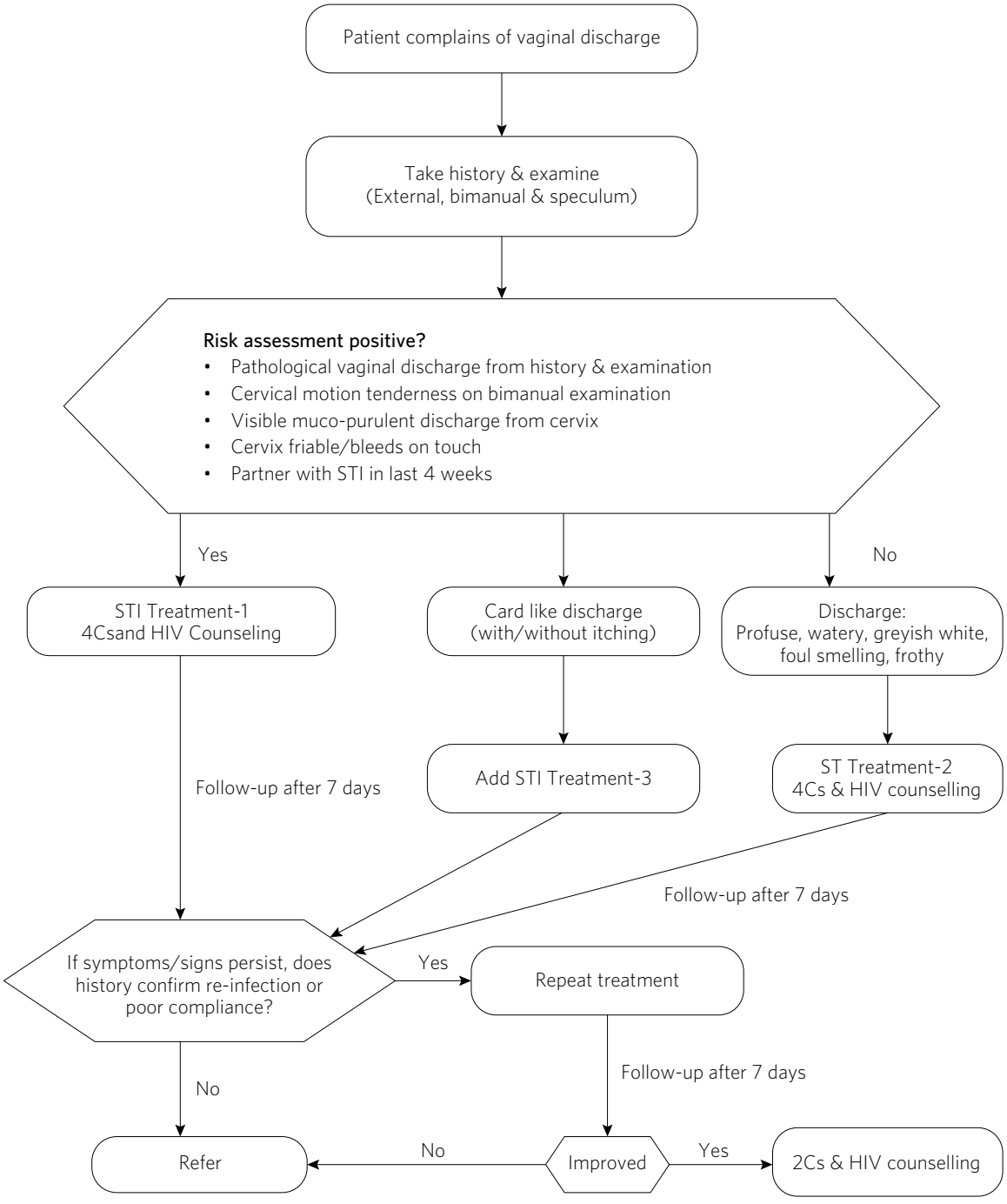
- Duration and nature of vaginal discharge (physiological/normal or pathological/ abnormal)
- Pregnancy history and contraceptive use history
- History of sexual behavior/practice & recent risk/exposure

Physical/speculum examination:

If speculum examination is possible do risk assessment based on:

- Cervical motion tenderness on bimanual examination
- Visible mucous/mucopus from the cervix

Syndromic Management Flowchart for Vaginal Discharge in females from general population (with speculum)



Treatment of Vaginal Discharge in Females from General Population

Treatment for the Patient[45]

STI treatment 1:
Ceftriaxone: 250mg by intramuscular injection, as a single dose; or
Cefixime: 400mg orally, as a single dose

PLUS
Azithromycin1 gm orally; or
Doxycycline* 100mg orally 12 hourly for 7 days; or
Erythromycin base 500 mg orally 6 hourly for 7 days

STI treatment 2:
Metronidazole* 2gm orally as a single dose; or
Metronidazole 500mg 2 times daily for 7 days; or
Tinidazole 2gm orally in a single dose

STI treatment 3 *(Considering Candidiasis):*
Fluconazole* 150mg orally as a single dose; or
Clotrimazole 1% cream 5 g intravaginally daily for 7–14 days; or
Clotrimazole 2% cream 5 g intravaginally daily for 3 days; or
Miconazole 2% cream 5 g intravaginally daily for 7 days; or
Miconazole 4% cream 5 g intravaginally daily for 3 days; or
Miconazole 100 mg vaginal suppository, one suppository daily for 7 days; or
Miconazole 200 mg vaginal suppository, one suppository for 3 days; or
Miconazole 1,200 mg vaginal suppository, one suppository for 1 day

**Note: Doxycycline and Fluconazolenot to be prescribed for, if she is pregnant or lactating. Metronidazole not to be prescribed for females in 1st trimester of pregnancy.*

Treatment for Partner[46]**:** (for all partners having unprotected sex within last 60 days of diagnosis)

Gonorrhea & Chlamydia: Inj. Ceftriaxone 250 mg IM in a single dose, OR, Cefixime 400 mg orally in a single dose, PLUS Azithromycin 1 gm orally in a single dose (STI treatment-1)

Bacterial Vaginosis & Vaginal Candidiasis: No treatment required

Trichomoniasis: Metronidazole 2 gm orally in a single dose or 500 mg twice daily for 7 days (STI treatment-2)

Advice: Abstain from unprotected sex for 7 days following patient& her partner have completed treatment/resolution of symptoms

45 WHO 2016 & CDC STI Guideline 2015

46 CDC STI Guideline 2015

Management of Vaginal Discharge Syndrome in Females with high-risk behavior

Vaginal discharge is a common complaint among women with high-risk behavior group. Vaginal discharge may result from vaginitis or cervicitis, half of the infections in female are asymptomatic. Therefore, treatment of women with high risk behaviour based on syndrome will cause substantial under treatment. Behavioural studies have shown that the number of clients among women with high risk behaviour is high and condom use is low. It is therefore recommended that women with high risk behaviour are treated based on their risk scoring and not on a syndromic diagnosis. A risk assessment criterion is established based on local information. To confirm the syndrome, do the following:

History:

- Duration and nature of vaginal discharge (physiological/normal or pathological/ abnormal)
- Pregnancy history
- Present contraceptive used
- History of sexual behaviour & recent risk/exposure

Physical/speculum examination:

If speculum examination is possible do risk assessment based on:

- Cervical motion tenderness on bimanual examination
- Visible mucous/mucopus from the cervix
- Check for presence of other RTI/STI

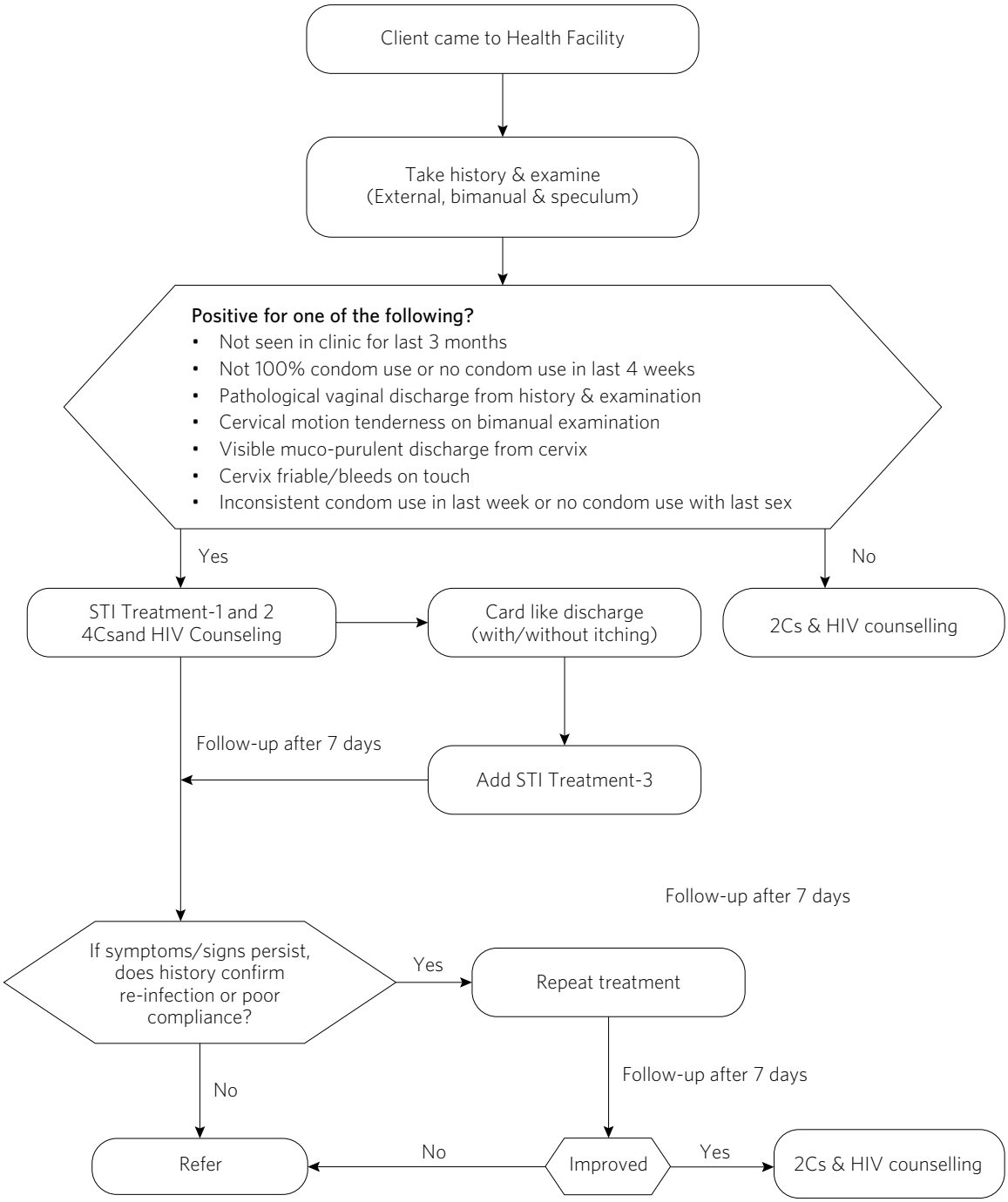
Syndromic Management for females with high risk behavior

The entry point for this flowchart is not vaginal discharge: it is applied to every FSW attending the service delivery point who is due for a sexual health check-up (periodically) or who has symptoms and signs of an STI. Treatment for chlamydial and gonococcal infection is based on risk assessment made after a full sexual history and a sexual health examination.

The risk assessment criteria comprise:

- Not seen in STI clinic in last 3 months
- Not 100% condom use in last working day or no condom use during last sex act
- Any pathological vaginal discharge from history and examination
- Cervical motion tenderness on bimanual examination
- Visible mucopus from the cervix
- Friable cervix

Syndromic Management Flow Chart for Vaginal Dischage in Females with High Risk Behavior



Treatment of vaginal discharge syndrome in females with high-risk behavior

Treatment for the Patient[47]

STI treatment 1:
Ceftriaxone: 250mg by intramuscular injection, as a single dose; or
Cefixime: 400mg orally, as a single dose

PLUS
Azithromycin1 gm orally; or
Doxycycline* 100mg orally 12 hourly for 7 days; or
Erythromycin base 500 mg orally 6 hourly for 7 days

STI treatment 2:
Metronidazole* 2gm orally as a single dose; or
Metronidazole 500mg 2 times daily for 7 days; or
Tinidazole 2gm orally in a single dose

STI treatment 3 *(Considering Candidiasis):*
Fluconazole* 150mg orally as a single dose; or
Clotrimazole 1% cream 5 g intravaginally daily for 7–14 days; or
Clotrimazole 2% cream 5 g intravaginally daily for 3 days; or
Miconazole 2% cream 5 g intravaginally daily for 7 days; or
Miconazole 4% cream 5 g intravaginally daily for 3 days; or
Miconazole 100 mg vaginal suppository, one suppository daily for 7 days; or
Miconazole 200 mg vaginal suppository, one suppository for 3 days; or
Miconazole 1,200 mg vaginal suppository, one suppository for 1 day

Note: Doxycycline and Fluconazolenot to be prescribed for, if she is pregnant or lactating. Metronidazole not to be prescribed for females in 1st trimester of pregnancy.

Treatment for Partner[48]**:** (for all partners having unprotected sex within last 60 days of diagnosis)

Gonorrhea & Chlamydia: Inj. Ceftriaxone 250 mg IM in a single dose, OR, Cefixime 400 mg orally in a single dose, PLUS Azithromycin 1 gm orally in a single dose (STI treatment-1)

Bacterial Vaginosis & Vaginal Candidiasis: No treatment required

Trichomoniasis: Metronidazole 2 gm orally in a single dose or 500 mg twice daily for 7 days (STI treatment-2)

Advice: Abstain from unprotected sex for 7 days following patient& her partner have completed treatment/resolution of symptoms

47 WHO 2016 & CDC STI Guideline 2015

48 CDC STI Guideline 2015

Referral:

If VDS in a female not improved or worsens after the 7 days follow up using appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/individual specialist for further management.

iii. Anorectal/Pharyngeal Discharge Syndrome

Causes of Anorectal/Pharyngeal Discharge:

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- *Trichomonas vaginalis*
- *Candida* species

Signs and Symptoms:

- Discharge from anus/pharynx
- Pain in anus/rectum/pharynx
- Itching

Management of Anorectal/Pharyngeal Discharge Syndrome

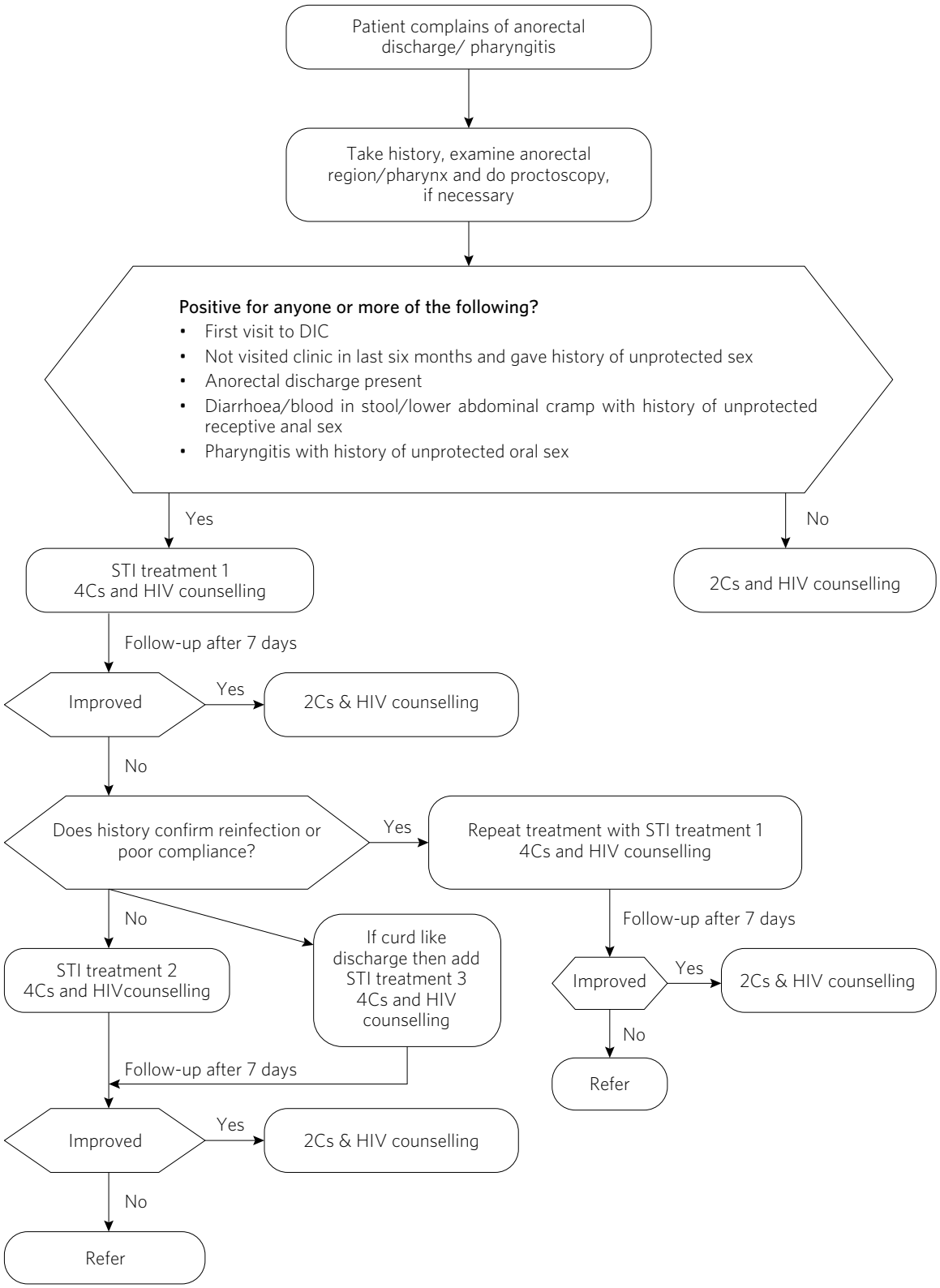
History:

- Duration and nature of discharge
- History of sexual behavior and recent risk/eposure

Physical Examination:

The anus/pharynx including the interior part of the rectum should be inspected and examined for discharge. Other STIs shoud be checked, if necessary a proctoscopy in case of anorectal discharge should be performed. Examination of the oro-pharyngeal region to be done with disposable tongue depresseor.

Syndromic Management Flow Chart for Patient with Anorectal/Pharyngeal Discharge



Treatment of Anorectal/Pharyngeal Discharge

Treatment for the Patient[49]

STI treatment 1:
Ceftriaxone: 250mg by intramuscular injection, as a single dose; or
Cefixime: 400mg orally, as a single dose

PLUS
Azithromycin1 gm orally; or
Doxycycline* 100mg orally 12 hourly for 7 days; or
Erythromycin base 500 mg orally 6 hourly for 7 days

STI treatment 2:
Metronidazole* 2gm orally as a single dose; or
Metronidazole 500mg 2 times daily for 7 days; or
Tinidazole 2gm orally in a single dose

STI treatment 3 ***(Considering Candidiasis):***
Fluconazole* 150mg orally as a single dose; or
Clotrimazole 1% cream 5 g intravaginally daily for 7–14 days; or
Clotrimazole 2% cream 5 g intravaginally daily for 3 days; or
Miconazole 2% cream 5 g intravaginally daily for 7 days; or
Miconazole 4% cream 5 g intravaginally daily for 3 days; or
Miconazole 100 mg vaginal suppository, one suppository daily for 7 days; or
Miconazole 200 mg vaginal suppository, one suppository for 3 days; or
Miconazole 1,200 mg vaginal suppository, one suppository for 1 day

**Note: Doxycycline and Fluconazolenot to be prescribed for, if patient/partner is pregnant or lactating. Metronidazole not to be prescribed for females in 1st trimester of pregnancy.*

Treatment for Partner[50]**:** (for all partners having unprotected sex within last 60 days of diagnosis)

Gonorrhea & Chlamydia: Inj. Ceftriaxone 250 mg IM in a single dose, OR, Cefixime 400 mg orally in a single dose, PLUS Azithromycin 1 gm orally in a single dose (STI treatment-1)

Trichomoniasis: Metronidazole 2 gm orally in a single dose or 500 mg twice daily for 7 days (STI treatment-2)

Advice: Abstain from unprotected sex for 7 days following patient& partner have completed treatment/resolution of symptoms

Referral:

If patent of anorectal/pharyngeal discharge not improved or worsens after the 7 days follow up using appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/ individual specialist for further management.

49 WHO 2016 & CDC STI Guideline 2015

50 CDC STI Guideline 2015

B. Characterized by Ulcers in Genital, Anal, Perianal region or Oropharangeal Ulcers

i. Genital Ulcer Syndrome (GUS)

Genital ulcer syndrome is characterized by ulceration in the genital region (Figure-7). It may be single or multiple ulcers and can be in external genitalia or internal genitalia. In males, ulcers can be on glans penis, prepuce, shaft of penis, scrotum, anogenital region, inguinal region and in the urethral meatus (opening). In females, ulcers can occur in inguinal region, mons pubis, labia majora or minora, vaginal entrance, vagina, cervix and the anogenital region. Genital ulcer may look very different due to secondary infection. Ulcers maybe painful or painless.

Causes of genital ulcer with causative agents:

1. Treponema pallidum: Syphilis
2. Sarcoptes scabiei (Mite): Scabies
3. Haemophilus ducryei: Chancroid
4. Herpes simplex: Genital Herpes
5. Chlamydia trachomatis serotype L1L2L3: Lymphogranuloma Venerum
6. Calymmatobacterium granulomatis (Kiebsbiella ganulaomatis): Donovaniasis

Symptoms of Genital Ulcer Syndrome:

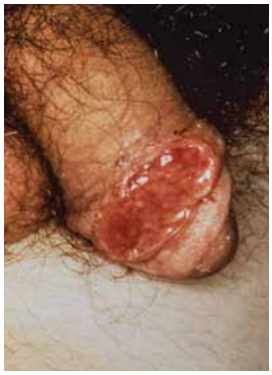
- Ulcers, sores or vesicles in the genital area
- The ulcer could be painful or painless, single or multiple
- Frequently associated with unilateral or bilateral lymphadenopathy (also known as a bubo)

Signs of Genital Ulcer:

- Ulcers, sores or vesicles in the genital area
- The ulcer could be painful or painless, single or multiple
- Ulcer may be itching and there may be signs of secondary in infection on the ulcer
- Frequently associated with unilateral or bilateral lymphadenopathy
- Inguinal swelling (bubo) in the absence of genital ulcer is attributed to inguinal swelling syndrome and patient are managed according to that flow chart

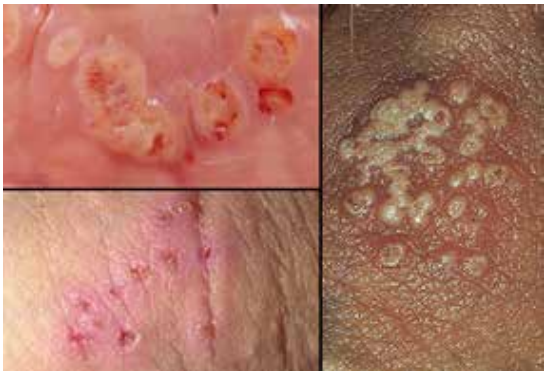
51 www.pathologyoutlines.com

52 https://www.mayoclinic.org/diseases-conditions/genital-herpes/symptoms-causes/syc-20356161

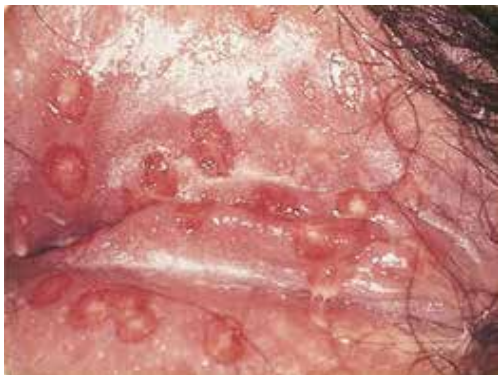


Syphilis

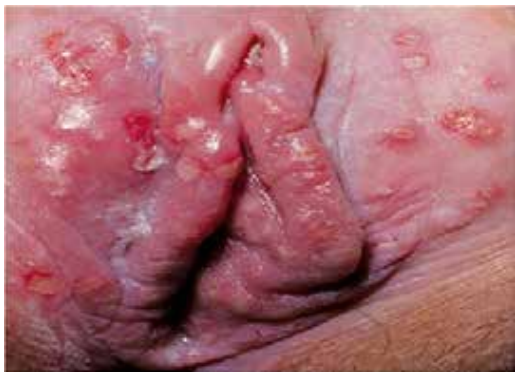
Chancroids[51]



Genital Herpes (male)[52]



Genital Herpes (Female)[53]



Genital Herpes (Female)[53]

Figure-7: Geneital Ulcers

It is not possible to make a conclusive distinction between the different aetiologies of genital ulcers on clinical grounds, because-

- Mixed infection is common
- The appearance of lesions could be altered by association of HIV infection, or other secondary infections, or the use of systemic and tropical antibiotics of corticosteroids and other local remedies (e.g.- treatment of chancroid may mask the course of incubating syphilis)
- Syphilis and chancroid are most common curable cause of genital ulcers

Table-4: Characteristics of Genital Ulcer:

Characteristics of ulcer	Syphilis	Chancroids	Herpes
Number	Usually single	Multiple	Multiple
Pain	Painless	Painful	Painful
Nature of ulcer	Clear	Dirty	Blister burst into shallow ulcer
Margin	Indurated	Deep	Superficial ulcers
Base	Hard	Soft	No base. If present then soft
Enlarged lymph node	Painless	Painful	If present then painful

53 http://h-eraser.com/herpersvirus.html

Consequences of Genital Ulcers:

- All ulcers increase the risk of acquiring and transmitting HIV infection
- If left untreated, Syphilis has serious consequences, such as late/tertiary syphilis: neurosyphilis and cardiosyphilis
- Stillbirth, premature delivery and congenital syphilis may occur due to transmission to the fetus

Management of Genital Ulcer Syndrome

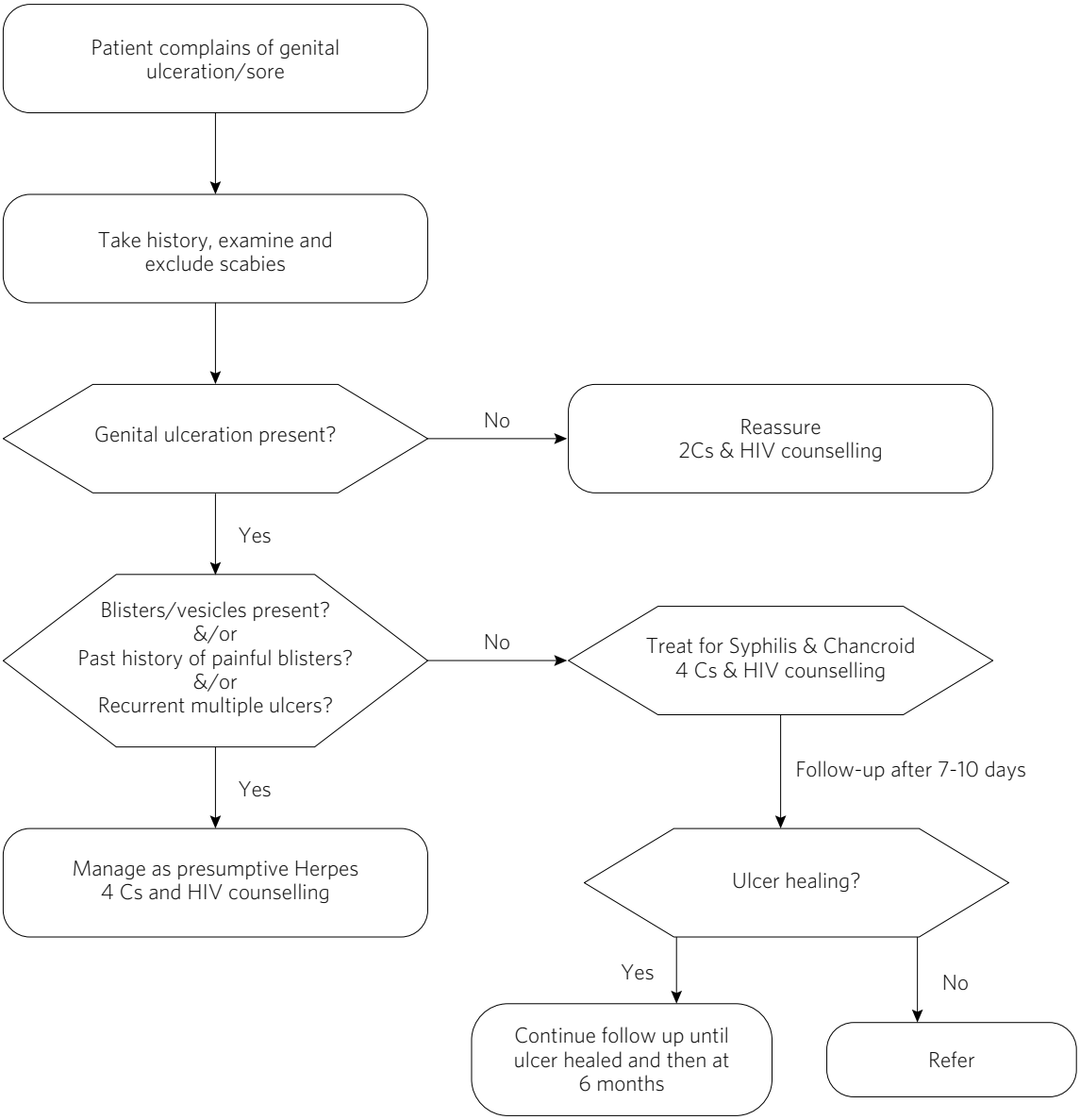
History:

- Duration and nature of the ulcer
- History of sexual behavior & recruit risk/exposure

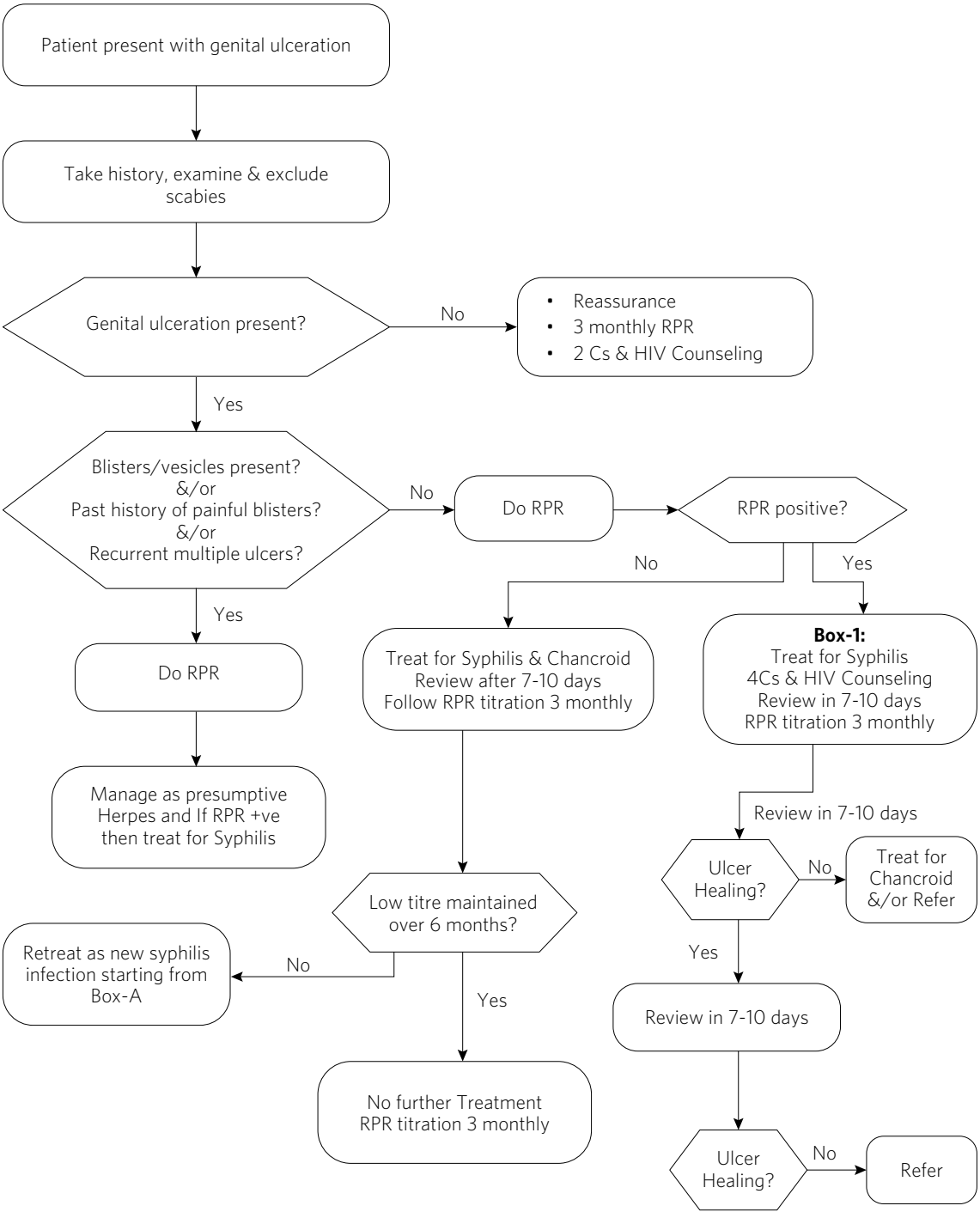
Physical Examination:

- Inspection of the genital organs to be done and number, size and pain in the ulcers to be observed
- Interior part of prepuse and covered part of glans penis in uncircumcised men and external genitalia and mucous surface of labia in women should be examined cerefully
- Inguinal lymph nodes should be palpated for swelling and pain
- Sings for other STIs to be checked

Syndromic Management Flow chart for Patients with Genital Ulcer (without RPR test)



Syndromic Management Flow chart for Patients with Genital Ulcer (with RPR test)



- Do RPR on first visit & 3 monthly
- Treat all RPR positive cases for Syphilis
- Whenever possible confirm (+ve) RPR by TPHA; but initial treatment should be based on positive RPR alone
- Repeat RPR/TPHA for (-ve) RPR in genital ulcer cases
- Confirmed negative TPHA indicates false RPR
- Refer patient if treatment fails/re-infections twice

Treatment of Genital Ulcer

Treatment for the Patient:

a. For Syphilis[54]

1. Injectable Benzathine penicillin G 24lakh units (2.4 million units) deep intramuscular (IM) as a single dose (1.2 million units in each buttock after skin hypersensitivity test); or

Doxycycline* 100 mg. Orally12 hourly for 14 days (if Benzathine penicillin G is not available); or

Erythromycin 500 mg, orally 6 hourly for 14 days

a. For Chancroid[55]

2. Azithromycin 1gm single dose; or

Erythromycin*500 mg, orally 6 hourly for 7 days; or

InjectableCeftriaxone 250 mg, IM as a single dose; or

Ciprofloxacin* 500 mg bd for 3 days

**Note: Doxycycline not to be prescribed during pregnancy or lactation. If Erythromycin is selected from the first group, you do not need to select another option from the second group.*

b. For Herpes[56]

Acyclovir 400 mg orally 3 times daily for 10 days

Note: for recurrent Herpes cases, the patient should be referred to appropriate facility/ individual specialist for further management.

Management of Genital Herpes

- Herpes cannot be cured
- Patients should be reassured, but warned that a recurrence of ulceration is possible
- The patient should be informed to avoid unprotected sexual intercourses while lesions are present
- Herpes infection can be passed whether ulceration is present or not
- Treatment of herpes is palliative
- Tell the patient to clean the lesions with soap and water and keep them dry.

Treatmentfor Partner[57]:

Symptomatic partner(s): Same treatment as of client

Asymptomatic partner(s):

For Syphilis- same treatment as of client

For other cases- should be evaluated clinically/examined and may send for serology/ diagnostic tests

54 WHO 2016 & CDC STI Guideline 2015

55 WHO 2016 & CDC STI Guideline 2015

56 WHO 2016 & CDC STI Guideline 2015

57 WHO 2016 & CDC STI Guideline 2015

Referral:

If Genital Ulcer in a patient not improved or worsens after the 7-10 days follow up using appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/individual specialist for further management.

ii. Anorectal/Oropharyngeal Ulcer Syndrome

Causes of Anorectal/Oropharyngeal Ulcers:

1. *Treponema pallidum*: Syphilis
2. *Haemophilus ducryei*: Chancroid
3. *Herpes simplex*: Genital Herpes

Signs and Symptoms of Anorectal/Oropharyngeal Ulcer Syndrome:

- Unilateral or bilateral enlargement of local lymph nodes.
- Complains anorectal/oropharyngeal sore or ulceration
- Blister/vesicles/ulcers found in anorectal/ oropharyngeal region

Consequences:

- Fistula
- Aseptic meningitis
- Encephalitis

Management of Anorectal/Oropharyngeal Ulcer Syndrome

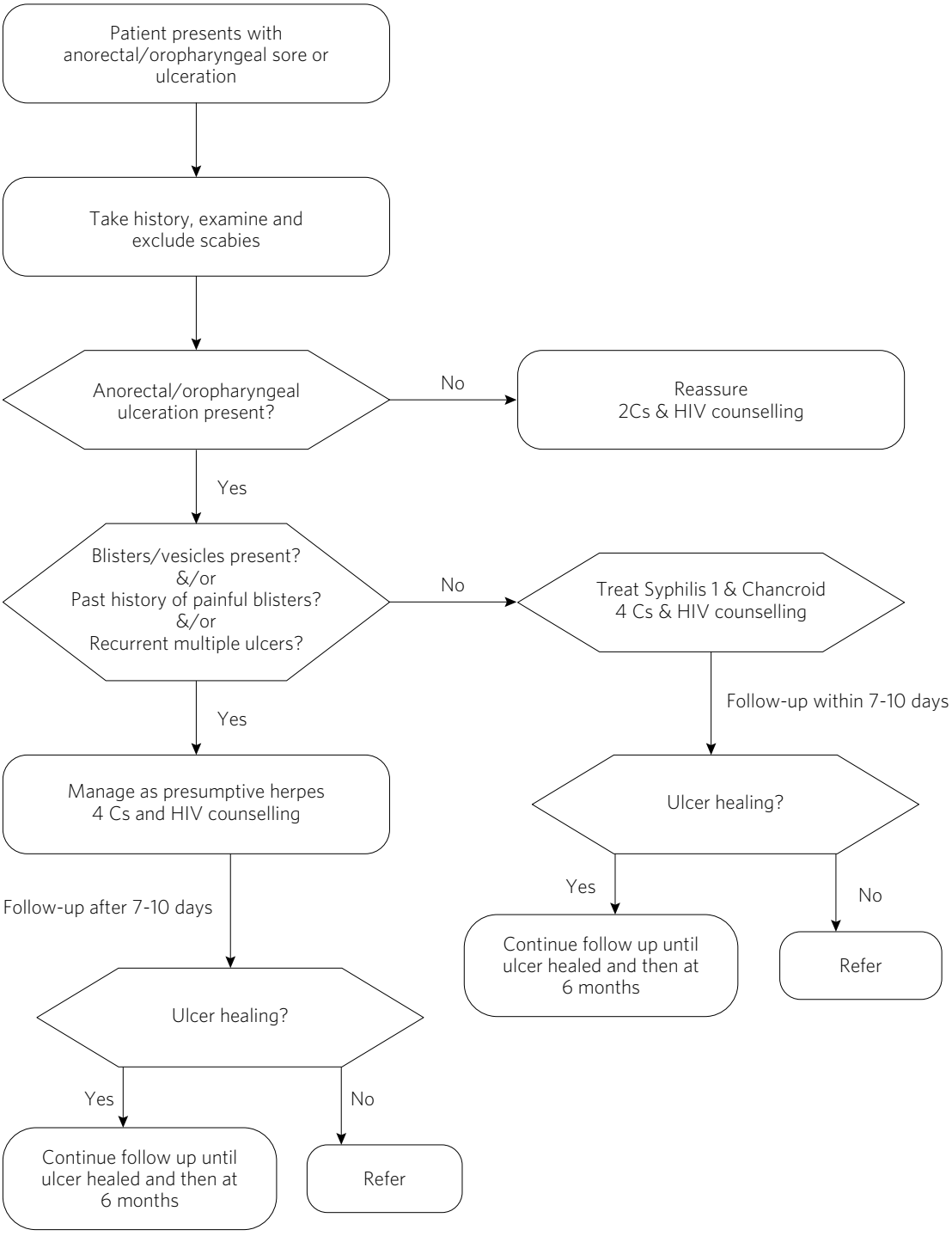
History:

- History of recent or past genital ulcer
- Duration and nature of ulcer
- History of recent or past swelling anywhere in the body

Physical Examination:

1. Inspecttion and palpation of lymph nodes for tenderness, temperature and fluctuation to be done
2. Anorectal/oropharyngeal region should be inspected for ulcers
3. Skin should be observed to find out rashes or sore
4. Sings for other STIs to be checked

Syndromic Management Flow Chart for Patients with Anorectal/Oropharyngeal Ulcer



Treatment for Anorectal/Oropharyngeal Ulcers

Treatment of the Patient:

a. For Syphilis[58]

1. Injectable Benzathine penicillin G 24lakh units (2.4 million units) deep intramuscular (IM) as a single dose (1.2 million units in each buttock after skin hypersensitivity test); or

Doxycycline* 100 mg. Orally12 hourly for 14 days (if Benzathine penicillin G is not available); or

Erythromycin 500 mg, orally 6 hourly for 14 days

a. For Chancroid[59]

2. Azithromycin 1gm single dose; or

Erythromycin*500 mg, orally 6 hourly for 7 days; or

InjectableCeftriaxone 250 mg, IM as a single dose; or

Ciprofloxacin* 500 mg bd for 3 days

**Note: Doxycycline not to be prescribed during pregnancy or lactation. If Erythromycin is selected from the first group, you do not need to select another option from the second group.*

b. For Herpes[60]

Acyclovir 400 mg orally 3 times daily for 10 days

Note: for recurrent Herpes cases, the patient should be referred to appropriate facility/ individual specialist for further management.

Management of Genital Herpes

- Herpes cannot be cured
- Patients should be reassured, but warned that a recurrence of ulceration is possible
- The patient should be informed to avoid unprotected sexual intercourses while lesions are present
- Herpes infection can be passed whether ulceration is present or not
- Treatment of herpes is palliative
- Tell the patient to clean the lesions with soap and water and keep them dry.

Treatment for Partner[61]**:**

Symptomatic partner(s): Same treatment as of client

Asymptomatic partner(s):

For Syphilis- same treatment as of client

For other cases- should be evaluated clinically/examined and may send for serology/ diagnostic tests

58 WHO 2016 & CDC STI Guideline 2015

59 WHO 2016 & CDC STI Guideline 2015

60 WHO 2016 & CDC STI Guideline 2015

61 WHO 2016 & CDC STI Guideline 2015

Referral:

If anorectal/oropharyngeal Ulcer in a patient not improved or worsens after the 7-10 days follow up using appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/individual specialist for further management.

C. Lower Abdominal Pain (LAP/PID)

Lower Abdominal Pain in Female: Lower abdominal pain syndrome results from pelvic inflammatory disease (PID). It may involve endometrium, fallopian tube, ovary and other pelvic organs.

Causesof LAP/PID

- *N. gonorrhoeae*
- *C. trachomatis*
- Anaerobic bacteria
- Other causes include
  - Gram negative rods (*G. vaginalis*, *bacteroids*, etc)
  - *Streptococci*

Sign & Symptom of LAP/PID

The main sign/symptoms of LAP/PID are:

- Vaginal or cervical discharge &
- Cervical motion tenderness or
- Pelvic tenderness
- Menometrorrhagia
- Dyspareunia

Complication/consequences of LAP/PID

- Chronic pelvic pain
- Infertility
- Ectopic pregnancy
- Tuba-ovarian abscess
- Peritonitis and intra-abdominal abscess

Management of Lower Abdominal Pain Syndrome

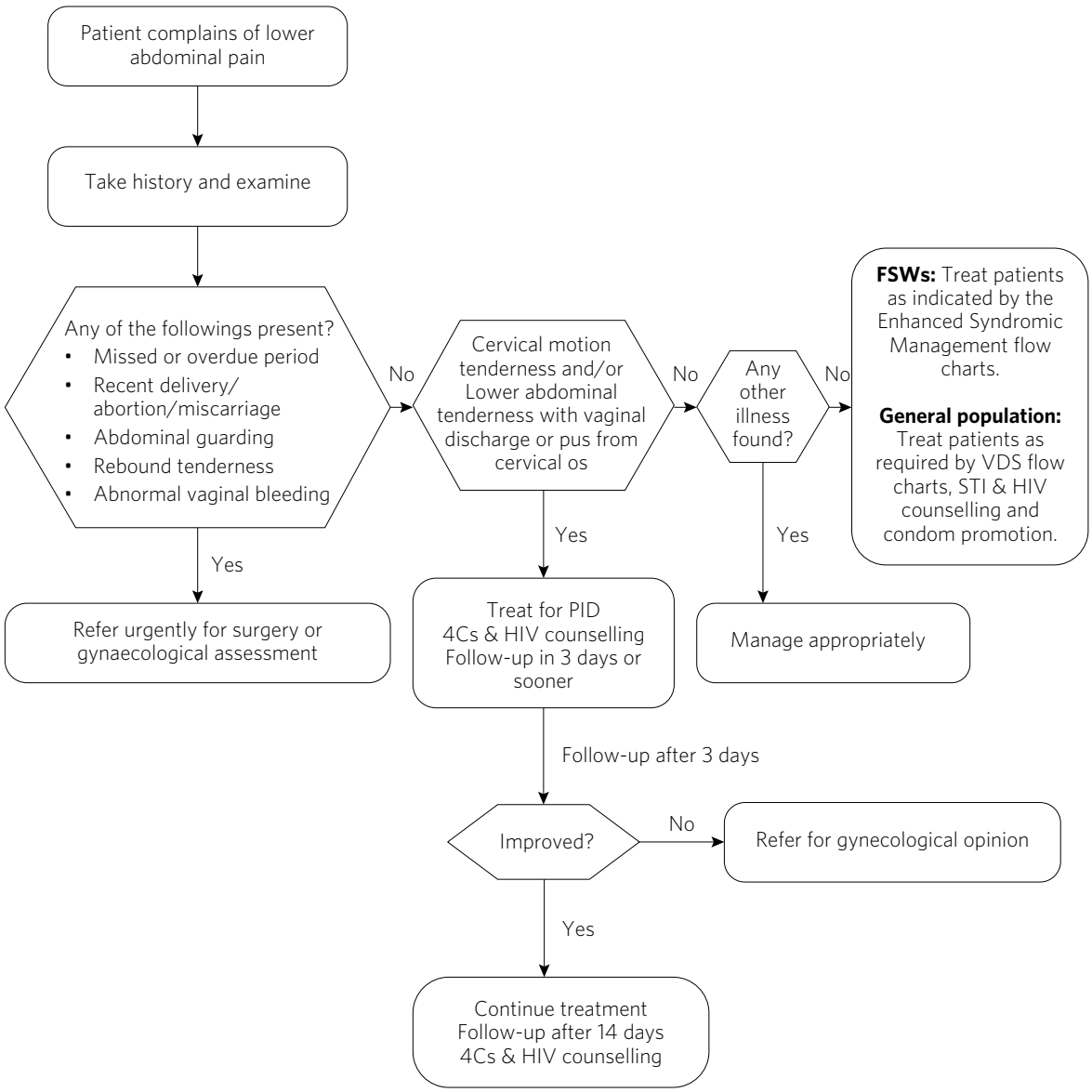
History:

- Duration and nature of LAP, fever
- History of pregnancy, delivery, abortion, miscarriage

Physical/speculum examination: examine the patient to find out-

- Cervical motion tenderness
- Lower abdominal tenderness
- Vaginal discharge or pus from cervix
- Cervical friability
- Presence of signs for other RTI/STI

Syndromic Management Flowchart for Patients with Lower Abdominal Pain



Immediate hospitalization of patients is required when-

- Diagnosis is uncertain
- Surgical emergencies such as appendicitis, ectopic pregnancy cannot be excluded
- Pelvic abscess is suspected
- Severe illness precludes out-patient management
- Patient is pregnant
- Patient is unable to follow out-patient regime
- Patient has failed to improve with out-patient treatment

Treatment of Lower Abdominal Pain (LAP/PID) Syndrome

Treatment for Patient[62]:

1. Ceftriaxone: 250mg by intramuscular injection, as a single dose; or

Cefoxitin 2 g IM in a single dose and Probenecid, 1 g orally administered concurrently in a single dose; or

Other parenteral third-generation cephalosporin (e.g., ceftizoxime or cefotaxime)

Plus

2. Doxycycline* 100mg orally 12 hourly for 14 days; or

Erythromycin base 500mg orally 6 hourly for 14 days

Plus

3. Metronidazole* 500mg orally 12 hourly for 14 days

Note: Doxycycline not to be prescribed to females during pregnancy and lactation. Metronidazole not to be prescribed in 1st trimester of pregnancy.

Treatment for Partner[63]: (Partners having sexual contact during 60 days preceding her onset of symptoms should be evaluated, tested & presumptively treated for Chlamydia & gonorrhea)

Inj. Ceftriaxone 250 mg IM in single dose, OR, Cefixime 400 mg orally in single dose,

PLUS

Azithromycin 1 gm orally in single dose (STI treatment-1)

Advice: To abstain from unprotected sex until she & her partner have completed treatment/ complete resolution of symptoms

Referral:

If PID/LAP in a female worsens after the 3 days follow up using appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/individual specialist for further management.

Hospitalization of the patient with acute PID should be seriously considered when-

- Diagnosis is uncertain
- Surgical emergencies such as appendicitis, ectopic pregnancy cannot be excluded
- Pelvic abscess is suspected
- Severe illness precludes out-patient management
- Patient is pregnant
- Patient is unable to follow out-patient regime
- Patient has failed to improve with out-patient treatment

62 CDC STI Guideliene 2015

63 CDC STI Guideliene 2015

D. Scrotal Swelling Syndrome

Scrotal Swelling:

Scrotal swelling is an enlargement of the scrotal sac. Scrotal swelling can occur due to injury or an underlying medical condition. It may be caused by an accumulation of fluid, inflammation, or an abnormal growth within the scrotum. It is usually caused by epididymitis or trauma, tumour and torsion of testes. The swelling may be painless or very painful. If the swelling is painful, person should seek emergency treatment.

Causes of Scrotal Swelling

Infections (epididymitis)

Complication of gonococcal urethritis and chlamydial urethritis

T. pallidum

Enteric bacteria

Chronic infections such as tuberculosis and filariasis

Others

Testicular torsion

Trauma to scrotum

Hydrocele

Tumors

Enlarged veins in the scrotum

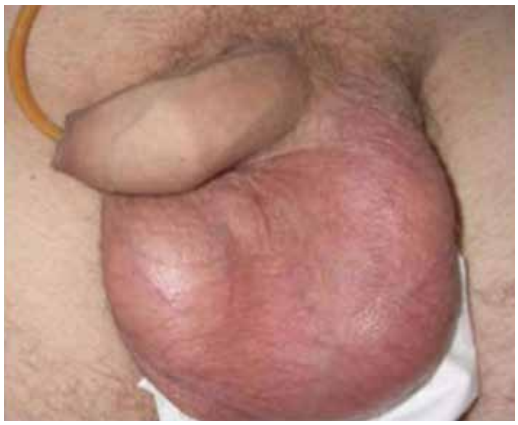


Figure-8: Scrotal Swelling

Signs and symptoms of scrotal swelling:

- Scrotum is swollen, hot and painful testes
- Usually unilateral, with only one testes involved
- May be associated or preceded by urethral discharge or painful urination
- High fever and hydrocele in patient with filarial epididymitis (often bilateral involvement)
- May be associated with mild constitutional symptoms such as fever, myalgia (aching muscles) and malaise

Consequences:

- Destruction and scarring of testicular tissues
- Infertility
- Impotence
- Prostatitis

Management of Scrotal Swelling Syndrome:

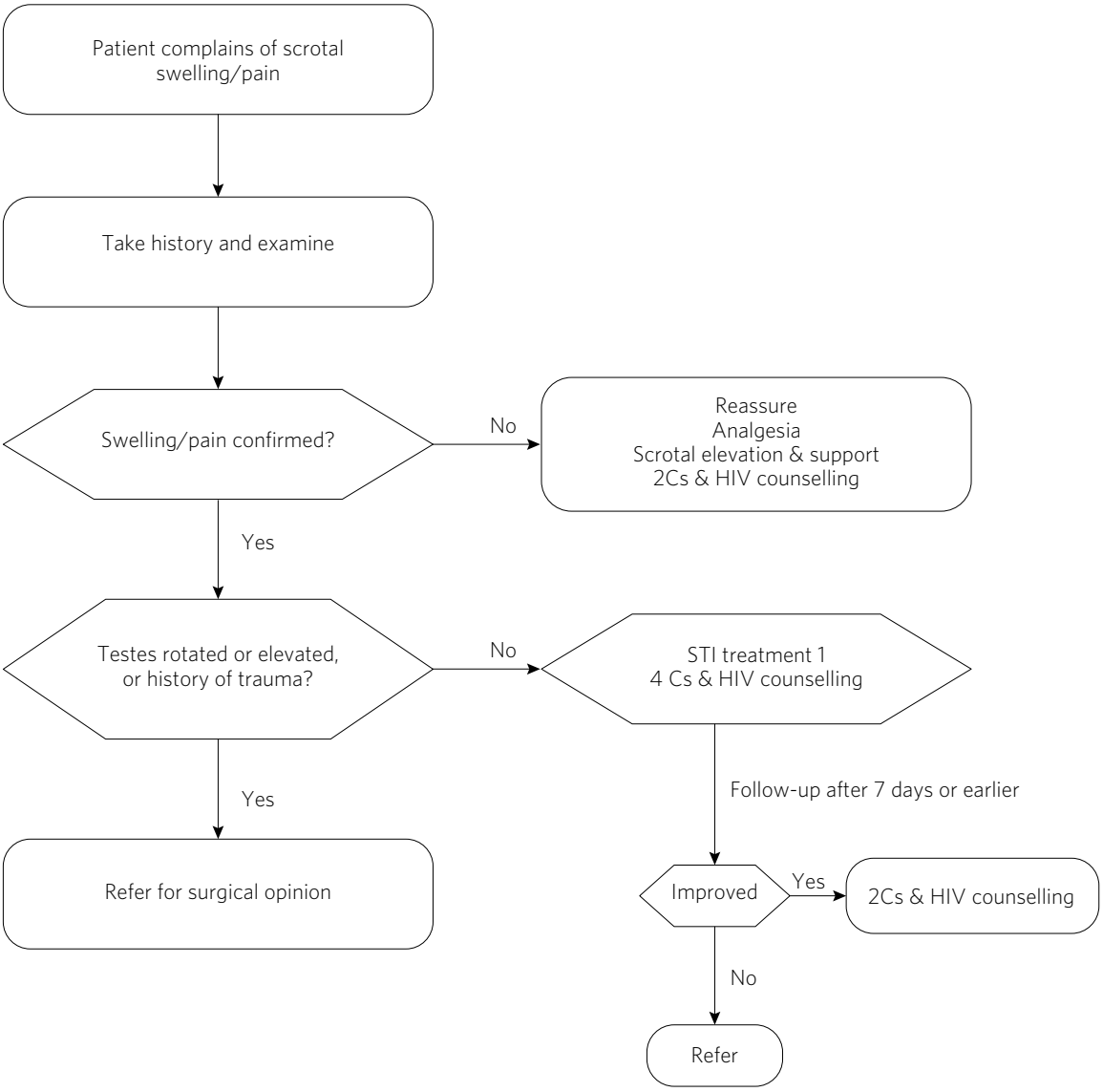
History:

- Onset of swelling
- Any history of injury
- History of STI
- History of urethral discharge

Physical Examination:

- Scrotal skin should be inspected for bruises
- Two sides of scrotum and scrotal sacs to be compared
- Scotum to be examined to check swelling and tenderness of testis
- Position of testis in the scrotumto be observed/examined to find out any elevation, rotation or torsion
- Presence of signs of other STIs to be excluded

Syndromic Management Flowchart for Patients with Scrotal Swelling



Treatment of Scrotal Swelling Syndrome:

Treatment of the Patient[64]:
STI treatment 1: Ceftriaxone: 250mg by intramuscular injection, as a single dose; or Cefixime: 400mg orally, as a single dose **PLUS** Azithromycin1 gm orally; or Doxycycline 100mg orally 12 hourly for 7 days; or Erythromycin base 500 mg orally 6 hourly for 7 days

Treatment for Partner[65]**:** (for all partners having unprotected sex within last 60 days of diagnosis)
Gonorrhea &Chlamydia: Inj. Ceftriaxone 250 mg IM in a single dose, OR, Cefixime 400 mg orally in a single dose, PLUS Azithromycin 1 gm orally in a single dose (STI treatment-1) *Advice: Abstain from unprotected sex for 7 days following patient &partner have completed treatment/resolution of symptoms*

Referral:

If scrotal swelling worsens or is not improved, even after the treatment for one week using appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/individual specialist for further management.

E. Inguinal Bubo (IB) Syndrome

Inguinal buboes are localized enlargement of the lymph nodes in the groin area usually caused by STIs. The enlarged lymph node may rupture results into an abscess of an inguinal lymph node. Acute infections of either the lower limb or the genital region may cause inguinal adenopathy (swelling of lymph nodes in the groin).

Causes of Inguinal Bubo:

1. Chancroid: when bubo and ulcer co-exist, signs suggest that the patient has Chancroid
2. Lymphogranuloma Venareum (LGV): when LGV is the cause, there is usually no ulcer present
3. Syphilis: syphilis causes non-tender, non-fluctuant and firm bubo.
4. Herpes
5. Tuberculosis: tuberculosis causes non-tender, non-fluctuant and matted bubo

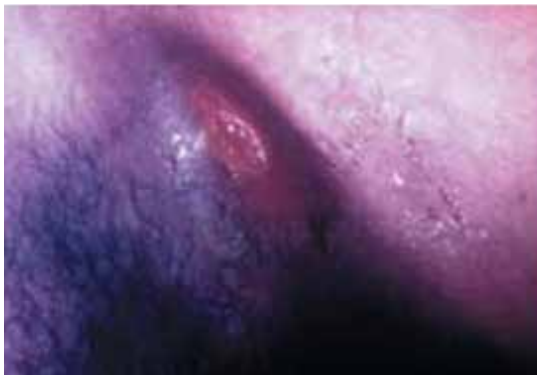
64 WHO 2016 & CDC STI Guideline 2015

65 WHO 2016 & CDC STI Guideline 2015

Signs and Symptoms of Inguinal Bubo Syndrome:

- Unilateral or bilateral enlargement of inguinal lymph nodes.
- Can be associated with genital ulcer disease.
- The swollen lymph nodes are tender, fluctuant and may rupture

Inguinal Bubo (non-ulcerative)



Inguinal Bubo (ulcerative)

Figure-9: Inguinal Bubo

Difference between the bubo of chancroid and LGV

- The primary genital lesion (ulcer) is usually absent or not noticeable in LGV.
- The characteristic groove sign (cleavage of swollen inguinal and femoral lymph nodes by inguinal ligament) is rare for Chancroid but pathognomonic for LGV.

Consequences:

- Fistula or sinus formation
- Extensive ulceration of genitalia
- Genital elephantiasis
- Retroperitoneal lymphadenopathy

Management of Inguinal Bubo

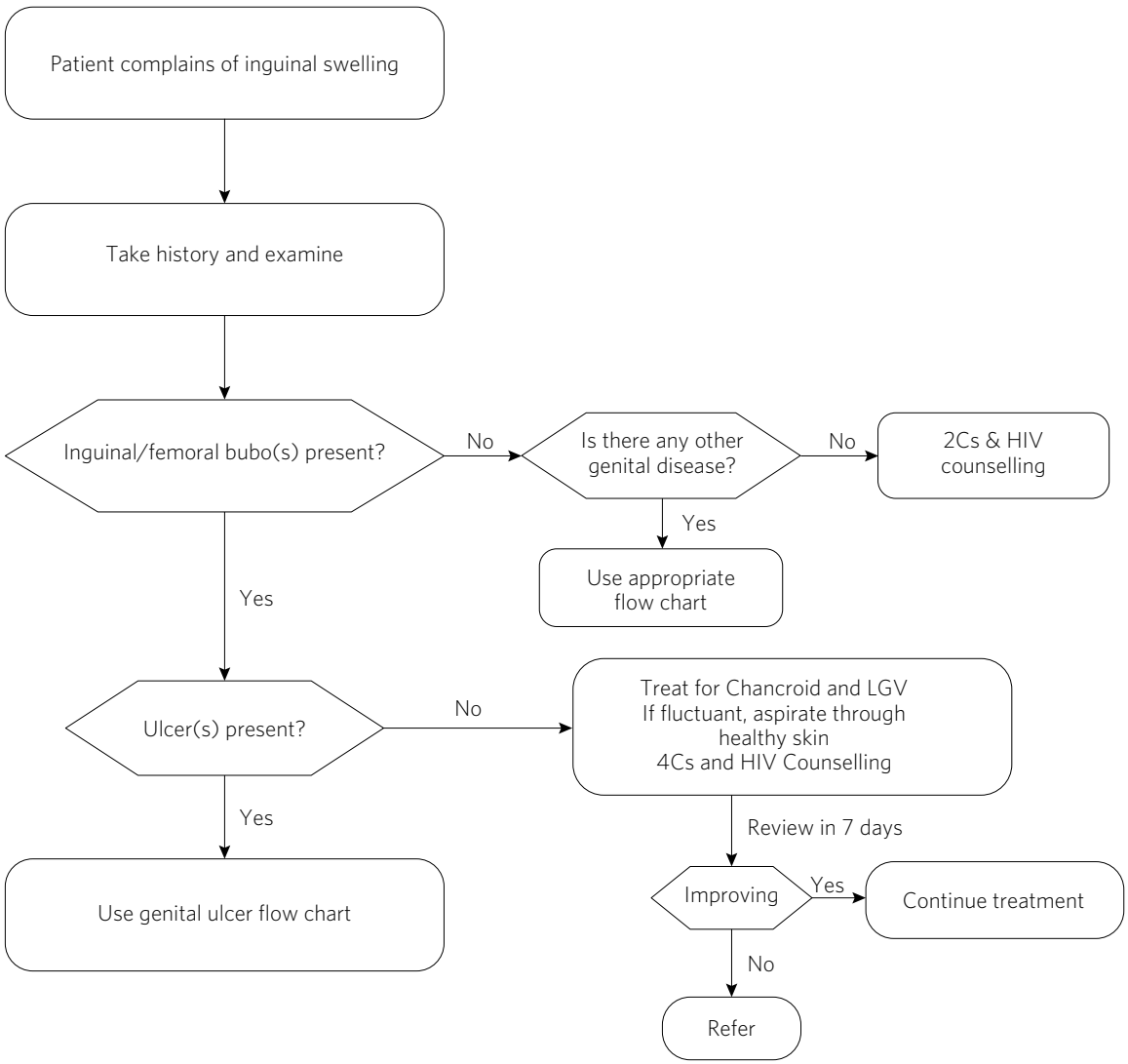
History:

- Duration and nature of bubo/groin pain
- Recent or past genital ulcer
- Recent or past swelling anywhere in the body
- Histroy of sexual behaviour & recent risk/exposure

Physical Examination:

1. Inspection and palpation of inguinal lymph nodes for tenderness, temperature and fluctuation
2. Inspection of genital organs for ulcers
3. Observe skin of inguinal region rashes or sore
4. If a bubo present, inspect the interior part of prepuse and covered part of glans penis in uncircumcised men and external genitalia and mucous surface of labia in women to exclude presence of genital ulcers
5. Inguinal hernia must be excluded
6. Check forpresnce of other STIs

Syndromic Management Flowchart for Patients with Inguinal Bubo



Treatment of Inguinal Bubo Syndrome

Treatment for the Patient[66]:

Chancroid treatment:

Azithromycin 1gm oral single dose; Or
Injectable Ceftriaxone 250 mg, IM as a single dose; Or
Ciprofloxacin* 500 mg two times daily for 3 days*

LGV treatment:

Doxycycline* 100 mg, orally 12 hourly for21 days; Or
Erythromycin base 500 mg, orally 6 hourly for21 days

**Note: Doxycycline andCiprofloxacinnot to be prescribed during pregnancy and lactation*

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Treatment for Partner[67]: (for all partners having unprotected sex within last 60 days of diagnosis)
Partner treatment will be same. Avoid Doxycycline during pregnancy and lactation and give Erythromycin 500 mg orally 6 hourly for 21 days *Advice: Abstain from unprotected sex for 7 days following patient& partner have completed treatment/resolution of symptoms*

Referral:

If inguinal bubo worsens or is not improved, even after the treatment for 1 week with appropriate antibiotic and adherence to 4Cs, refer the patient to appropriate facility/individual specialist for further management.

Management of Fluctuant Bubo

If a bubo becomes fluctuant, it may burst and create more complications. Management of a fluctuant bubo should include:

- Buboes should not be incised, but aspirated with wide bore needle
- Surgical aspiration of fluctuant bubo should be done through the adjacent healthy skin
- If necessary, aspiration could be repeated after 2-3 days
- Refer, if necessary

F. Neonatal Conjunctivitis (NC)

Neonatal conjunctivitis or opthalmia neonatorum is defined as any conjunctivitis with discharge occurring in infants during the first 28 days of life. The eye infection is usually acquired during pregnancy or during delivery through an infected birth canal.

Causes of Neonatal Conjunctivitis:

The most serious causes of neonatal conjunctivitis are:

- organisms causing RTI/STI; e.g- *Neisseria gonorrhoea, Chlamydia trachomatis*
- Pyogenic Bacteria: e.g.-*Staphylococcus aureus, Streptococcus pneumonia, Hemophilus spp*. and *pseudomonas spp.*
- Occasionally other gram-negative bacteria (often hospital acquired, usually do not endanger sight)

Signs and Symptoms of the Syndrome:

The signs and symptoms depend on whether NC is caused by *Neisseria gonorrhoea, Chlamydia trachomatis* or other bacterial infections acquired at or after birth. Although each aetiological agent produces a slightly different pattern of disease, the sign/symptoms considerably overlap.

- Purulent conjunctival discharge
- Swollen eyelids/closed eyes/sticky eyes
- Maybe unilateral or bilateral

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Complications/Consequences:

- Ulceration of the cornea often progressing to perforation of the eyeball with loss of vision.
- In gonococcal infection, extra-ocular manifestations like arthritis/septicemia may develop.
- In Chlamydial infection complications such as pneumonia and otitis media may develop.

Prevention of Neonatal Conjunctivitis[68]

- All women attending antenatal clinics should be assessed for Cervicitis and if positive, should be treated promptly along with partner(s)
- Immediately after delivery, wipe the baby's face and eyes with sterile dry cotton (hydrophilic cotton) before the eyes are opened.
- Open the baby's eyes by gently parting the upper and lower eyelid
- Apply 1% Tetracycline eye ointment into each inferior conjunctival sac.

Management of Neonatal Conjunctivitis Syndrome

To confirm the diagnosis, do the following-

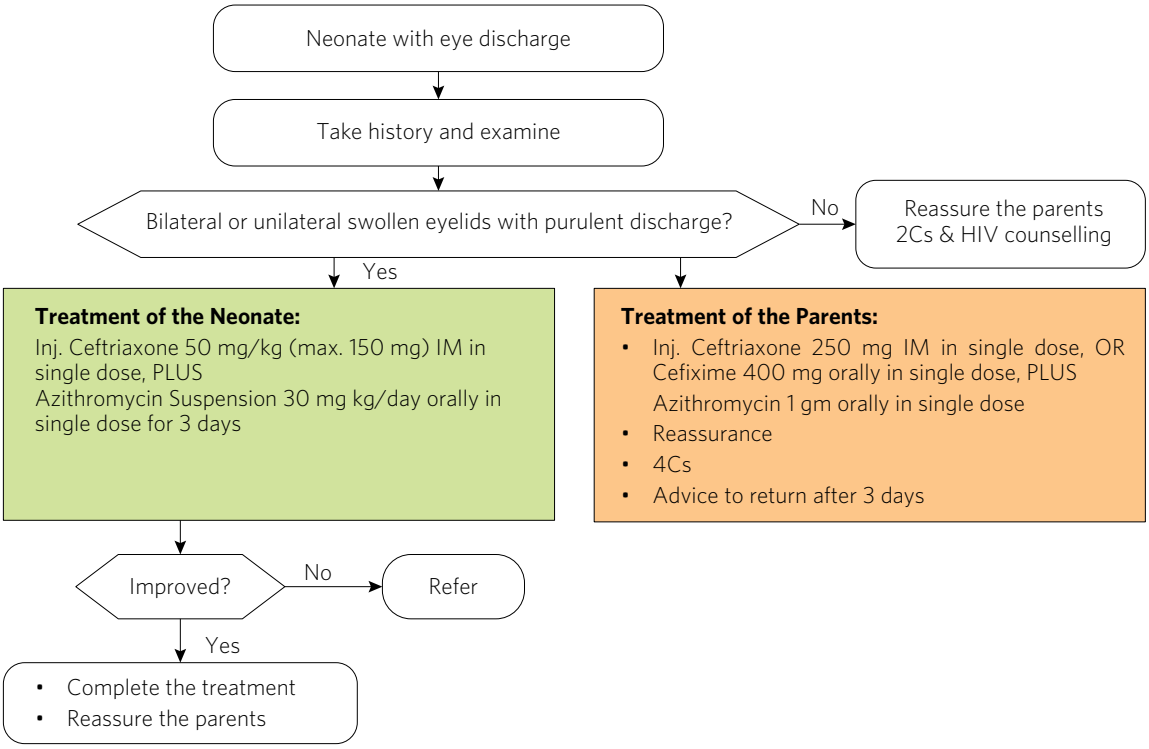
History:

- History of mother or her partner have any RTI/STI symptoms
- History from the mother on her sexual behavior/exposure

Physical Examination:

- Neonate's eyes should be inspected for purulent discharge:(Separate or press the eyelids, to look for pus pouring out beneath them)

Syndromic Management Flowchart for Neonatal Conjunctivitis



68 CDC STI Guideline 2015

Treatment for Neonatal Conjunctivitis Syndrome:

A. Treatment for Neonate[69]:
Inj. Ceftriaxone 50 mg/kg (max. 150 mg) IM in single dose, PLUS Azithromycin Suspension 30 mg kg/day orally in single dose for 3 days

B. Treatment for Parents[70]:
Inj. Ceftriaxone 250 mg IM in single dose; or Cefixime 400 mg orally in single dose, PLUS Azithromycin 1 gm orally in single dose

Referral:

If the condition worsens or does not improve after treatment at follow-up using appropriate antibiotic, refer the neonate to appropriate facility/individual specialist for further management.

5.3 Others

A. Oral STIs

Transmission of STIs during unprotected oral sex is possible but has relatively lower risk compared to vaginal and anal sex. Both partners are at risk if condom, dental dam or other barriers are not used during oral sex.

The most commonly occurred infections are-

- Oral Herpes
- Gonorrhoea
- Syphilis

Less frequently occurred infections are-

- Chlamydia
- HIV
- Hepatitis A, B, C
- Genital warts
- Helminthes
- Pubic lice

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Among all STIs, Neisseria gonorrhea is of particular concern due to its increasing resistance to potential antibiotics. A cross-sectional bio-behavioral STI survey conducted in Bangladesh in 2014 found oro-pharyngeal region as the most common site of STI and approximately >10% MSW and hijra were positive for oro-pharyngeal gonorrhea which was reasonably high in comparison to anorectal STI.[71]

One can only pass on an infection through oral sex if s/he already has one, and s/he can only get an infection if her/his partner has an infection. Many people do not get or notice signs or symptoms, and do not know they have an infection. Infections can be passed on in a number of ways through oral sex:

- '**Skin to skin**' or '**hair to hair**' contact - Infection can be passed on through skin to skin or hair to hair (e.g. pubic hair to beard, moustache). Infections can be passed on if these come in contact with a partner's mouth, genitals or anus. Infections that can spread in this way include Herpes simplex which cause cold sores on the mouth, syphilis which can cause blisters or sore, pubic lice, etc. Genital wart is rarely passed to the mouth and lips by oral sex. Sometimes infections caused by these organisms maybe asymptomatic and therefore spread can occur unknowingly.
- **Body fluids** – Infected body fluids, such as semen, pre-ejaculatory fluid, and blood can pass infection when it comes in contact with sores, cuts, ulcers, or inflamed cells on the lips, mouth; the membrane of the eye, the cells of the throat. Chlamydia, gonorrhoea, hepatitis B, hepatitis C, HIV and syphilis can be passed on in this way.
- **Ingestion** – Hepatitis A and helminthes can be passed on through rimming (stimulating a partner's anus by tongue).

It is important to conduct oro-pharyngeal examination as a routine practice using disposable tongue depressor while conducting physical examination to exclude any cold sore, blister, discharge or ulcer in the lips, gum, buccal cavity or pharynx. One should also check the mustache and beard (if present) to exclude the presence of lice.

B. Anogenital Warts

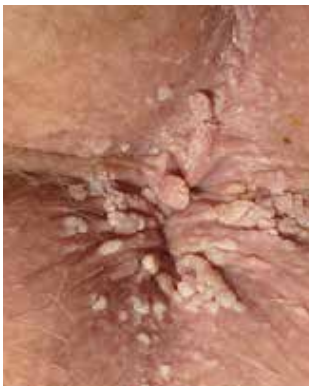
Of anogenital warts, 90% are caused by nononcogenic HPV types 6 or 11; these types can be commonly identified beforeor at the same time anogenital warts are detected. HPVtypes 16, 18, 31, 33, and 35 are also occasionally found inanogenital warts (usually as co-infections with HPV 6 or 11) and can be associated with foci of high-grade squamousintraepithelial lesions (HSIL), particularly in persons whohave HIV infection. In addition to anogenital warts, HPVtypes 6 and 11 have been associated with conjunctival, nasal, oral, and laryngeal warts. Secondary syphilis is another cause of anogenital Warts.

Anogenital warts are usually asymptomatic, but depending onthe size and anatomic location, they can be painful or pruritic. They are usually flat, papular, or pedunculated growths on thegenital mucosa. Anogenital warts occur commonly at certainanatomic sites, including around the vaginal introitus, under the foreskin of the uncircumcised penis, and on the shaft ofthe circumcised penis. Warts can also occur at multiple sites in the anogenital epithelium or within the anogenital tract (e.g., cervix, vagina, urethra, perineum, perianal skin, anus, and scrotum). Intra-anal warts are observed predominantlyin persons who have had receptive anal intercourse, but theyalso can occur

71 Khanam R et al. 2015

in men and women who have not had a historyof anal sexual contact.

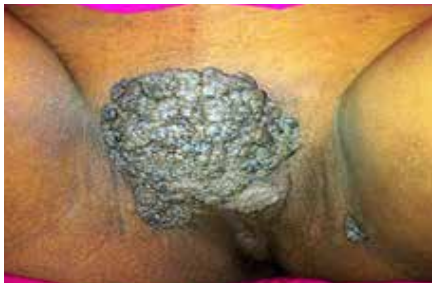
Condyloma Accuminata (anal wart)[72]



Condyloma Accuminata (anal wart)[73]

Condyloma lata (anal wart) secondary syphilis

Condyloma Accuminata (genital wart)



Genital Wart (female)

Figure 10: Anogenital warts

Diagnostic Considerations

Diagnosis of anogenital warts is usually made by visualinspection. The diagnosis of anogenital warts can be confirmedby biopsy, which is indicated if lesions are atypical (e.g., pigmented, indurated, affixed to underlying tissue, bleeding, or ulcerated lesions). Biopsy might also be indicated inthe following circumstances, particularly if the patient isimmunocompromised (including those infected with HIV): 1) the diagnosis is uncertain; 2) the lesions do not respond tostandard therapy; or 3) the disease worsens during therapy.HPV testing is not recommended for anogenital wart diagnosis, because test results are not confirmatory and do not guidegenital wart management.

Treatment[74]

The aim of treatment is removal of the wart and amelioration of symptoms, if present. The appearance of warts also canresult in significant psychosocial distress, and removal canrelieve cosmetic concerns. In most patients, treatment resultsin resolution of the wart(s). If left untreated, anogenital wartscan resolve spontaneously, remain unchanged, or increase insize or number. Because warts might spontaneously resolvewithin 1 year, an acceptable alternative for some persons is toforego treatment and wait for spontaneous resolution. Availabletherapies

72 The Welcome Trust, 2003

73 Surgical-tutor.org.uk, 2012

74 CDC STI Guideline 2015

for anogenital warts might reduce, but probablydo not eradicate, HPV infectivity. Whether the reductionin HPV viral DNA resulting from treatment reduces futuretransmission remains unknown.

Treatment of anogenital warts should be guided by wart size, number, and anatomic site; patient preference; cost of treatment; convenience; adverse effects; and provider experience.

Recommended Treatment Regimens for External Anogenital Warts[75] (i.e., penis, groin, scrotum, vulva, perineum, external anus, and perianus*)

Imiquimod 3.75% or 5% cream; or

Podofilox 0.5% solution or gel; or

Sinecatechins 15% ointment; or

Cryotherapy with liquid nitrogen or cryoprobe; or

Surgical removal either by tangential scissor excision, tangential shaveexcision, curettage, laser, or electro surgery, or, Trichloroacetic acid (TCA) or bichloroacetic acid (BCA) 80%–90%solution

*Note: Many persons with external anal warts also have intra-anal warts. Thus, persons with external anal warts might benefit from an inspection of the anal canal by digital examination, standard anoscopy, or high-resolution anoscopy.

C. Scabis *(Details is in the aetiological management section)*

The predominant symptom of scabies is pruritus. Sensitization to Sarcoptes scabiei occurs before pruritus begins. The first time a person is infested with *S. scabiei*, sensitization takes up to several weeks to develop. However, pruritus might occur within 24 hours after a subsequent reinfestation. Scabies in adults frequently is sexually acquired, although scabies in children usually is not.

Treatment[76]

Recommended Regimens

Permethrin 5% cream applied to all areas of the body from the neck down and washed off after 8–14 hours and repeat it 7 days later same way

Alternative Regimens

Benzoyal peroxide 2.5% lotion applied in a thin layer to all areas of the body from the neck down and thoroughly washed off after 8 hours

Figure 11: Papular lesions and scaly patches of scabies on the penis[77]

Note: Infants and young children should be treated with permethrin. Infants and young children aged <10 years should not be treated with lindane. Permethrin is effective, safe, and less expensive

75 CDC STI Guideline 2015

76 CDC STI Guideline 2015

77 The Welcome Trust, 2003

than Ivermectin. One study demonstrated increased mortalityamong elderly, debilitated persons who received Ivermectin, but this observation has not been confirmed in subsequent reports. Ivermectin has limited ovicidal activity andmay not prevent recurrences of eggs at the time of treatment; therefore, a second dose of Ivermectin should be administered14 days after the first dose. Ivermectin should be taken withfood because bioavailability is increased, thereby increasingpenetration of the drug into the epidermis. Adjustments to Ivermectin dosing are not required in patients with renalimpairment, but the safety of multiple doses in patients withsevere liver disease is not known.[78]

Bedding and clothing should be decontaminated (i.e., either machine-washed, machine-dried using the hot cycle, or dry cleaned) or removed from body contact for at least 72 hours. Fumigation of living areas is unnecessary. Persons with scabies should be advised to keep fingernails closely trimmed to reduceinjury from excessive scratching.

D. *Pediculosis Pubis* *(Details is in the aetiological management section)*

Persons who have *pediculosis pubis* (i.e., pubic lice) usually seek medical attention because of pruritus or because they notice lice or nits on their pubic hair. *Pediculosis pubis* is usually transmitted by sexual contact.

Treatment[79]

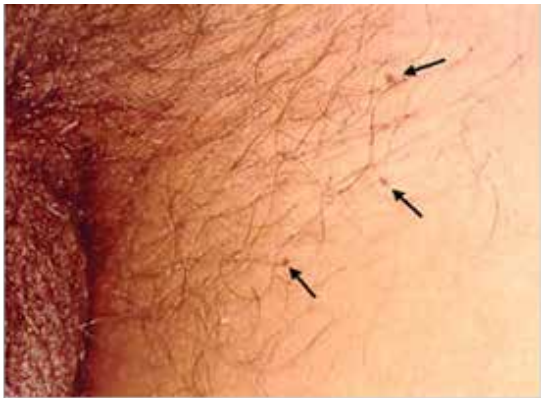
Recommended Regimens

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

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

Alternative Regimens

Malathion 0.5% lotion applied to affected areas and washed off after 8–12 hours



Pubic lice seen in the pubic hair of a male patient[80]

Fig.12- Pubic lice (Pediculosis pubis)

The recommended regimens should not be applied to the eyes. Pediculosis of the eyelashes should be treated by applying occlusive ophthalmic ointment or petroleum jelly to the eyelid margins twice a day for 10 days. Bedding and clothing should be decontaminated (i.e., machine-washed and dried using theheat cycle or dry cleaned) or removed from body contact for at least 72 hours. Fumigation of living areas is not necessary. Persons with pediculosis pubis should be evaluated for other STDs, including HIV.

Note: Reported resistance to pediculcides (permethrin and pyrethrins) has been increasing and is widespread. Malathion can be used when treatment failure is believed to have occurred as a result of resistance. The odor and long duration of application associated with malathion therapy make it a less attractive alternative compared with the recommended pediculcides.

78 CDC STI Guideline 2015

79 CDC STI Guideline 2015

80 The Welcome Trust, 2003

5.4 Management of Anaphylaxis

All service delivery points administering antibiotic medications, particularly by intra-muscular injections, should be adequately equipped and prepared to manage an allergic or anaphylactic reaction. Essential drugs and equipment for the management of anaphylaxis include:

1. Adrenaline (epinephrine) 1:1000 for injection
2. Antihistamines for injection and oral administration (e.g., promethazine, chlorpheniramine)
3. Hydrocortisone for injection
4. Ambu bag for ventilation

Note: It is not expected that service delivery points should be able to manage more than immediate, emergency life-saving aspects of dealing with a patient undergoing an anaphylactic reaction. Patients should be transferred to the nearest hospital or other appropriate facility as soon as it is safe to do so.

Skin Testing and Penicillin

- Penicillin skin testing with the major and minor determinants of penicillin can reliably identify persons at high risk for IgE-mediated reactions to penicillin. Skin testing for penicillin can be done if proper management facility of reactions is available.[81]
- Penicillin Allergy Skin Testing: Persons at high risk for anaphylaxis, including those who 1) have a history of penicillin-related anaphylaxis or other IgE-mediated reactions, asthma, or other diseases that would make anaphylaxis more dangerous or 2) are being treated with beta-adrenergic blocking agents should be tested with 100-fold dilutions of the full-strength skin-test reagents before being tested with full-strength reagents. In these situations, testing should be performed in a monitored setting in which treatment for an anaphylactic reaction is available. If possible, antihistamines (e.g., chlorpheniramine maleate, fexofenadine, diphenhydramine HCL, and hydroxyzine) should not have been taken within the 5 days before skin testing.[82]
- Patients known to be allergic or at high risk of being allergic to penicillin should receive alternative treatment regimen

Section-6
Etiological agents and approach of Management

6.1 Bacteial Agents

A. Chlamydia trachomatis

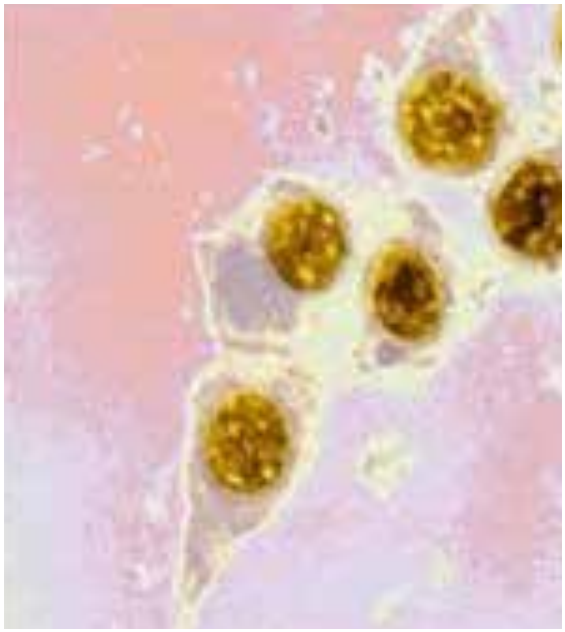


Figure-1 Chlamydia trachomatis

Chlamydia trachomatis causes Chlamydia infection only in human. This is a common sexually transmitted infection which causes cervicitis in women; however, urethritis and proctitis occur in both men and women. Chlamydia trachomatis has different serovars which causes different kinds of infections. Serovars A to C cause trachoma which can cause blindness. Serovars D to K cause cervicitis, urethritis which may progress to the upper genital tract. Serovars L1 to L3 cause LGV or lymphogranuloma venereum (infection of macrophages to regional draining of lymph nodes). Chlamydial infections in women can lead to serious consequences including pelvic inflammatory disease (PID), tubal factor infertility, ectopic pregnancy, and chronic pelvic pain. Lymphogranuloma venereum (LGV) is a STI occurs commonly in the developing world, and has more recently emerged as a cause of outbreaks of proctitis among men who have sex with men (MSM) worldwide. Urethral and cervical infection by Chlamydia trachomatis is most common and infections are usually asymptomatic. Asymptomatic infection is common especially in women and is often unrecognized, leading to infection in sexual partners and to long-term sequel.

Transmission: Chlamydia is transmitted through sexual contact with the penis, vagina, mouth, or anus of an infected partner. Ejaculation does not have to occur for chlamydia to be transmitted or acquired. Chlamydia can also be spread perinatally from an untreated mother to her baby during childbirth. The possibility of sexual abuse should be considered in prepubertal children beyond the neonatal period with vaginal, urethral, or rectal chlamydial infection.

Clinical Features: Rectal or genital chlamydial infection can persist one year or longer in infants infected at birth. Urogenital infection is symptomatic among the males which is characterized by urethral discharge, burning sensation during micturition, signs of epididymitis and prostatitis,

ano-rectal discharge or discomfort in anal infection. In females, urogenital infection is presented with increased vaginal discharge (Purulent or mucopurulent), lower abdominal pain, dyspareunia, post-coital or inter-menstrual bleeding, painful urination, signs of pelvic inflammatory disease (PID), chronic pelvic pain and ano-rectal discharge or discomfort. The primary lesion Lymphogranuloma venereum is transient and often imperceptible, in the form of a painless papule or pustule or shallow erosion. It is found on the glans penis of males and on the vaginal wall or on the labia, and occasionally on the cervix of females; extragenital lesions have been reported such as in the oral cavity (tonsil) and extragenital lymph nodes. Tender inguinal and/or femoral lymphadenopathy that is most commonly unilateral (two thirds of cases). It may involve one lymph node or the entire chain, which can become matted with considerable periadenitis and bubo formation, may ulcerate and discharge pus from multiple points, creating chronic fistulas.

Complications: In most cases infection generally remains localized to the anogenital and pharyngeal mucosae, but it may spread to the upper genital tract to cause epididymitis in men or pelvic inflammatory disease (PID) in women (<10%). In males, infection of the paraurethral ducts, chronic prostatitis, seminal vesiculitis and urethral stricture are the most common complication of chlamydia infection. In females, pelvic inflammatory disease (PID), salphingitis, oophoritis, infertility and ectopic pregnancy are the most common. The destruction of lymph nodes in Lymphogranuloma venereum may result in lymphoedema of genitals (elephantiasis) with persistent suppuration and pyoderma.

Laboratory Diagnosis: Diagnosis of *Chlamydia trachomatis*is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section-7.

Treatment[83] (urethral/cervical infection):

Azithromycin 1 gm orally; or

Doxycycline* 100 mg orally twice daily for 7 days; or

Erythromycin base 500 mg orally 6 hourly for 7 days

Treatment of Lymphogranuloma Venereum[84]

Doxycycline* 100 mg orally twice a day for 21 days; or

Erythromycin base 500 mg orally four times a day for 21 days

*Note: Doxycycline not to be prescribed to females during pregnancy and lactation.

83 WHO 2016 & CDC STI Guideline 2015

84 CDC STI Guideline 2015

B. *Gardenella vaginalis & Others (Bacterial vaginosis)*

It causes abnormal vaginal discharge in women of child-bearing age characterized by a shift in the vaginal flora from the dominant lactobacillus spp. to a mixed vaginal flora that includes *Gardnerella vaginalis*, Bacteroids spp., Mobiluncus spp., and *Mycoplasma hominis*. It is not regarded as sexually transmitted. It can arise and remit spontaneously in women regardless of sexual activity. Having a new sex partner or multiple sex partners, as well as douching, can upset the balance of bacteria in the vagina. This place a woman at increased risk for getting BV. We also do not know how sex contributes to BV. There is no research to show that treating a sex partner affects whether or not a woman gets BV. Having BV can increase your chances of getting other STDs. BV rarely affects women who have never had sex.

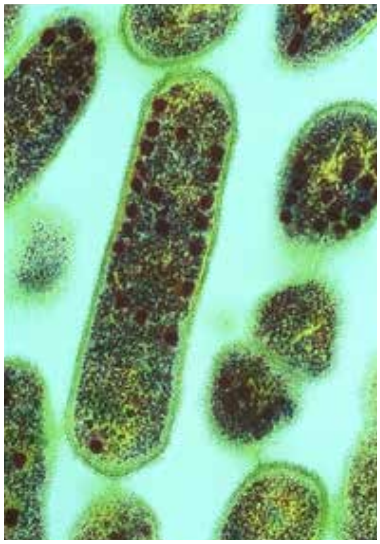


Figure 2-*Gardenella vaginalis*

Transmission: BV is an endogenous infection of vaginal canal and is not a sexually transmitted infection but creates the similar symptoms like STIs.

Incubation Period: As the infection arises due to change in vaginal echo system there is no incubation period.

Clinical presentation: Many women remain asymptomatic. The most common manifestation is offensive fishy smelling vaginal discharge, which is thin, white, homogeneous; however, this is not associated with soreness, itching or irritation.

Laboratory Diagnosis: Diagnosis of Bacterial vaginosis is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section-7.

Treatment[85]: Metronidazole 500 mg 2 times daily for 7 days

C. Haemophilus ducreyi

Haemophilus ducreyi which is a bacterium causes Chancroid and results in painful, superficial ulcers, often with regional lymphadenopathy. Chancroid occurs in Asia, Africa, and the Caribbean. When infection does occur, it is usually associated with sporadic outbreaks. Worldwide, chancroid appears to have declined as well, although infection might still occur in some regions of Africa and the Caribbean. Like genital herpes and syphilis, chancroid is a risk factor in the transmission and acquisition of HIV infection.

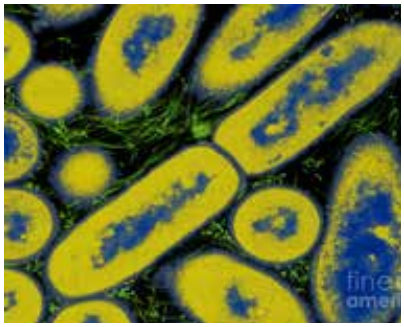


Figure-3 Haemophilus ducreyi

85 CDC STI Guideline 2015

Transmission: By sexual contact

Incubation Period: 4 to 10 days

Clinical Features: The genital ulcer from chancroid is painful, tender, and nonindurated. The lesion at the site of infection is, initially, a pustule that breaks down to form a painful, soft, ulcer with a necrotic base and irregular borders. Multiple lesions and inguinal adenopathy often develop. With lymph node involvement, fever, chills, and malaise may also develop. Other symptoms of chancroid include painful urination, vaginal discharge, rectal bleeding, pain with bowel movements, and dyspareunia. For both clinical and surveillance purposes, a probable diagnosis of chancroid can be made if all of the following criteria are met: 1) the patient has one or more painful genital ulcers; 2) the clinical presentation, appearance of genital ulcers and, if present, regional lymphadenopathy are typical for chancroid; 3) the patient has no evidence of *T. pallidum* infection by dark field examination of ulcer exudate or by a serologic test for syphilis performed at least 7 days after onset of ulcers; and 4) an HSV PCR test or HSV culture performed on the ulcer exudate is negative.

Laboratory Diagnosis: Diagnosis of chancroid is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section-7.

Treatment[86]:

Azithromycin 1 g orally in a single dose; or

Ceftriaxone 250 mg IM in a single dose; or

Ciprofloxacin 500 mg orally twice a day for 3 days; or

Erythromycin base 500 mg orally three times a day for 7 days

Successful treatment for chancroid cures the infection, resolves the clinical symptoms, and prevents transmission to others. In advanced cases, scarring can result despite successful therapy.

D. Mycoplasma genitalium

The pathogenic role *of Mycoplasma genitalium* is less definitive in women than it is in men. *Mycoplasma genitalium* can be found in the vagina, cervix, and endometrium. Although strong and consistent evidence has linked *Mycoplasma genitalium* to urethritis in men, it remains unknown whether this infection can cause male infertility or other male anogenital tract disease syndromes. The organism has been detected in men with epididymitis in a limited number of cases, but this has not been extensively investigated.

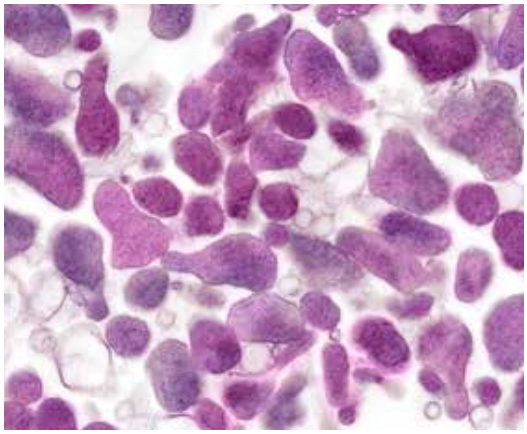


Figure-4 Mycoplasma genitalium

Incubation Period: 4 to 10 days

Transmission: by sexual contact

86 CDC STI Guideline 2015

Clinical Features: Among male**,** the most common clinical manisfestations are nongonococcal urethritis (NGU), nonchlamydial NGU, persistent or recurrent urethritis and rectal symptoms (infrequently). In female, women are commonly asymptomatic. The cervicitis, PID, increased risk for preterm delivery and adverse pregnancy outcomes (uncommon) are the common clinical presentation.

Note: In the absence of diagnostic tests, Mycoplasma genitalium should be suspected in cases of persistent or recurrent urethritis and may be considered in persistent or recurrent cases of cervicitis and PID.

Laboratory Diagnosis: Diagnosis of *Mycoplasma genitalium* is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section-7.

Treatment: *Mycoplasma genitalium* lacks a cell wall and thus antibiotics like beta-lactams including penicillins and cephalosporins are ineffective against this organism. Given the diagnostic challenges, treatment of most *Mycoplasma genitalium* infections will occur in the context of syndromic management for urethritis, cervicitis, and PID.

Urethritis and cervicitis[87]

Cap. Doxycycline 100 mg regimen 2 times daily recommended- for 7-day

Or

1-g single dose of azithromycin

or

For persons with treatment failures after 1-g azithromycin regimen, a longer course of azithromycin (an initial 500-mg dose followed by 250 mg daily for 4 days)

In case of azithromycin resistance cases- Moxifloxacin (400 mg daily orally x 7, 10 or 14 days)

PID

Recommended PID treatment regimens are based on antibiotics that are not effective against *M. genitalium*. Therefore, clinicians might consider M. genitalium in cases that do not respond to therapy within 7–10 days. Where validated *M. genitalium* testing is available, clinicians might test women with PID for M. genitalium. When M. genitalium is detected, a regimen of moxifloxacin 400 mg/day for 14 days has been effective in eradicating the organism.

E. Neisseria Gonorrhea

Neisseria gonorrhoeae causes Gonorrhoea which involve columnar epithelium in the lower genital tract, rectum, pharynx and eyes. Infection of children beyond the neonatal period usually indicates sexual abuse. Gonorrhoea is most commonly diagnosed in MSM, among young heterosexual male. Immunity to new infection is not provided by previous infection.

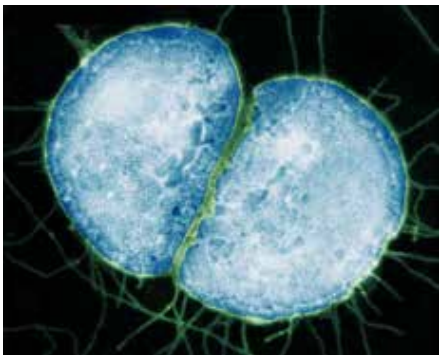


Figure-5: Neisseria gonorrhoeae

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Transmission: Transmission is usually the result of vaginal, anal or oral sex. Gonococcal conjunctivitis may be caused by accidental infection from contaminated finger. Untreated mothers may infect babies during delivery, resulting in ophthalmia neonatorum.

Incubation Period: The incubation period is usually 2 to 10 days.

Clinical Features: *Urogenital Gonorrhoea:* Among male mucopurulent or purulent urethral discharge, dysuria, asymptomatic in about 10% of cases. Ano-rectal symptoms in MSM like discharge, irritation, painful defecation, disturbed bowel function. In female, asymptomatic infection is found in majority of cases; however, vaginal discharge, dyspareunia, cervicitis, the urethra with mucopurulent discharge and contact bleeding, paraurethral glands/ducts are also found. Ano-rectal symptoms are present among MSM like discharge, irritation, painful defecation, disturbed bowel function due to anal sex or contamination from urogenital site. *Pharyngeal gonorrhea:* due to receptive orogenital sex, usually symptomless. *Gonococcal Conjunctivitis*: presenting with purulent discharge from the eye(s), severe inflammation of the conjunctivae and oedema of the eyelids, pain and photophobia. Gonococcal ophthalmia neonatorum presents with purulent conjunctivitis and oedema of the eyelids; urgently treat to prevent corneal damage. *Disseminated Gonococcal Infection (DGI):* is seen rarely, and typically affects women with asymptomatic genital infection. Symptoms include arthritis of one or more joints, pustular skin lesions, tenosynovitis and fever. Gonococcal endocarditis has been described.

Laboratory Diagnosis: Diagnosis of *Neisseria gonorrhoeae* is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section-7.

Treatment[88]:

Ceftriaxone: 250 mg by intramuscular injection - as a single dose; or

Cefixime: 400 mg orally as a single dose **Plus**

Azithromycin 1 gm orally; or

Doxycycline* 100 mg orally twice daily for 7 days; or

Erythromycin base 500 mg orally 6 hourly for 7 days

**Note: Doxycycline not to be prescribed to females during pregnancy and lactation*

F. Treponema pallidum

Treponema pallidum is a spirochete of the family treponemataceae that causes syphilis. Usually the ulcer heals after 2 to 3 weeks and the infection progresses through several stages, eventually causing serious complications several years after acquisition. Treponema pallidum is a spiral or corkscrew-shaped micro-organism.

Transmission: The infection is acquired by direct contact of tissue fluid containing syphilitic ulcer during physical contact (operational definition) or from mother to fetus. It is a chronic infection.

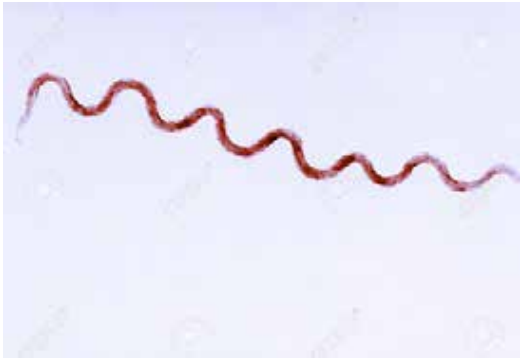

Figure-6 Treponema pallidum

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Incubation period: The incubation period of Syphilis varies from 9 to 90 days following the day of exposure, with an average of 2 to 10 weeks.

Clinical features: Clinical features of syphilis depend on the phase and type of infection. Syphilis is characterized by a variety of manifestations as well as periods of completely asymptomatic latency. Untreated mothers may infect their offspring transplacentally. Based on phase and type of infection, syphilis is divided into 3 stages.

Classification of Syphilis

A. Acquired Syphilis

a. Early (less than two years after infection)
- Primary
- Secondary
- Latent

b. Late (more than two years after infection)
- Latent
- Tertiary (benign gummatous)
- Others (Cardio vascular, neurosyphilis)

B. Congenital Syphilis
- Clinical
- Latent

Laboratory Diagnosis: Diagnosis of ***Syphilis*** is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section-7.

Treatment[89]:

Early Syphilis (primary, secondary and early latent syphilis of not more than two years' duration): Benzathine penicillin G 2.4 million units IM in a single dose

Late Syphilis or Latent Syphilis of Unknown Duration (infection of more than two years' duration without evidence of treponemal infection): Benzathine penicillin G 7.2 million units total, administered as 3 doses of 2.4 million units IM each at 1-week intervals

Note: *When Benzathine or procaine penicillin cannot be used (e.g. due to penicillin allergy) or are not available (e.g. due to stock-outs), the WHO STI guideline suggests using doxycycline 100 mg twice daily orally for 14 days or ceftriaxone 1 g intramuscularly once daily for 10–14 days, or, in special circumstances, azithromycin 2 g once orally.*

Note: *for Pregnant women, when Benzathine or Procaine penicillin cannot be used (e.g. due to penicillin allergy where penicillin desensitization is not possible) or are not available, the WHO STI guideline suggests using, with caution, erythromycin 500 mg orally four times daily for 14 days or ceftriaxone 1 g intramuscularly once daily for 10–14 days or azithromycin 2 g once orally.*

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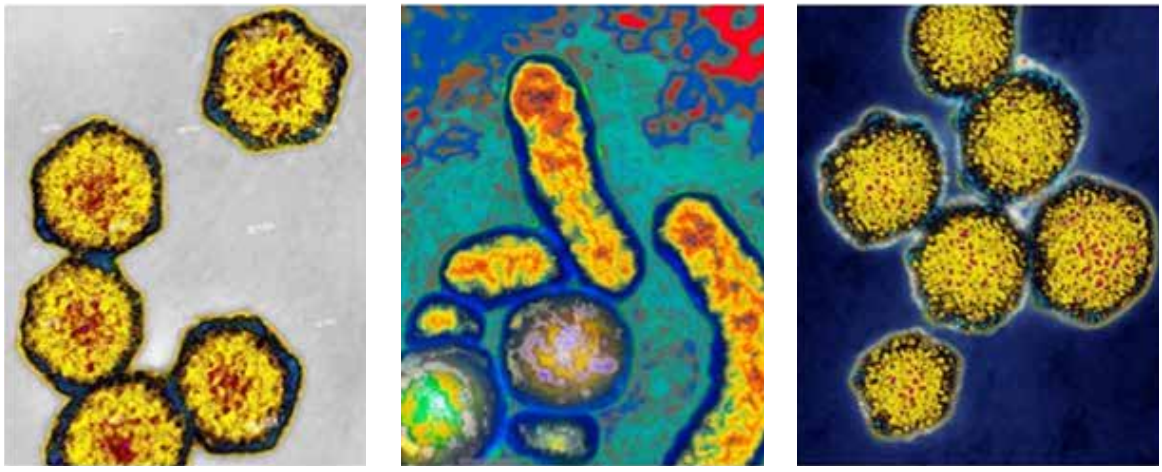
6.2 Viral Agents

A. Hepatitis A, B and C

Hepatitis A, caused by infection with the hepatitis A virus (HAV), which replicates in the liver and is shed in high concentrations in feces from 2–3 weeks before to 1 week after the onset of clinical illness. HAV infection produces a self-limited disease that does not result in chronic infection or CLD. However, up to 10% of patients experience a relapse of symptoms during the 6 months after acute illness. Acute liver failure from hepatitis A is rare (overall case-fatality rate: 0.5%). The risk for symptomatic infection is directly related to age, with >70% of adults having symptoms compatible with acute viral hepatitis and most children having either asymptomatic or unrecognized infection. Antibody produced in response to HAV infection persists for life and confers protection against reinfection. HBV infection can be self-limited or chronic. In adults, approximately half of newly acquired HBV infections are symptomatic, and approximately 1% of reported cases result in acute liver failure and death. Risk for chronic infection is inversely related to age at acquisition; approximately 90% of infected infants and 30% of infected children aged <5 years become chronically infected compared with 2%–6% of persons who become infected as adults. Among persons with chronic HBV infection, the risk for premature death from cirrhosis or hepatocellular carcinoma (HCC) is 15%–25%.



a. Hepatitis A virus b. Hepatitis B virus c. Hepatitis C virus

Figure-7: Viruses causing hepatitis.

Incubation Period of viral hepatitis:

- HAV: 15 -50 days with an average of 28 to 30 days.
- HBV: 45-180 days (usually less than 100 days)
- HCV: 2-6 weeks

Transmission: HAV infection is primarily transmitted by the fecal-oral route, by either person-to-person contact or through consumption of contaminated food or water. Transmission of HAV during sexual activity probably results from fecal-oral contact; however, efforts to promote good personal hygiene have not been successful in interrupting outbreaks of hepatitis A. Although viremia occurs early in infection and can persist for several weeks after onset of symptoms, blood borne transmission of HAV is uncommon. Transmission by saliva has not been demonstrated. Among adults with identified risk factors, most cases occurred among sexual and household

contacts; those with children attending a nursery, daycare, or preschool and persons working in such settings; MSM; IDUs; international travelers; and persons exposed to a common-source food or water outbreak. HBV is efficiently transmitted by percutaneous or mucous membrane exposure to HBV-infected blood or body fluids that contain HBV. The primary risk factors associated with infection among adolescents and adults are unprotected sex with an infected partner, multiple partners, MSM, history of other STDs, and injection-drug use. In addition, several studies have demonstrated other modes of HBV transmission, including premastication and lapses in health-care infection-control procedures, as less common sources of transmission.

The highest concentrations of HBV are found in blood, with lower concentrations found in other body fluids including wound exudates, semen, vaginal secretions, and saliva. HBV is more infectious and more stable in the environment than other blood-borne pathogens (e.g., HCV and HIV). HCV is primarily transmitted parenterally, usually through shared drug-injection needles and paraphernalia. HCV also can be transmitted through exposures in health-care settings as a consequence of inadequate infection-control practices. Transmission following receipt of blood, tissues, and organs from donors with HCV infection has occurred only rarely since 1992, when routine screening of these donated products was mandated in the United States. Tattoos applied in regulated settings have not been associated with HCV transmission, although those obtained in unregulated settings have been linked to such transmission. Occupational and perinatal exposures also can result in transmission of HCV, but such transmission is uncommon.

Clinical Features: Acute illness characterized by abrupt fever, malaise, anorexia, nausea, vomiting and abdominal pain followed by jaundice; Generalized itching, sometimes. The disease varies in clinical severity from a mild self-limited illness lasting 1 to 2 weeks to a severely disabling disease lasting several months and prolonged; Relapsing hepatitis for up to a year occurs in 15% of cases.

Laboratory Diagnosis: Following tests are performed to reach specific diagnosis of cases of viral hepatitis caused by HAV, HBV and HCV.

- HAV- Immunoglobulin M (IgM) antibody to HAV (anti-HAV IgM): Positive
- HBV- HBsAg positive, AND anti-HBc IgM: Positive
- HCV- Anti-HCV IgM: Positive

Diagnosis of viral hepatitis is confirmed by clinical presentation and laboratory tests.

Treatment

HAV: Patients with acute hepatitis A usually require only supportive care, with no restrictions in diet or activity. Hospitalization might be necessary for patients who become dehydrated because of nausea and vomiting and is critical for patients with signs or symptoms of acute liver failure. Medications that might cause liver damage or are metabolized by the liver should be used with caution among persons with hepatitis A.

HBV: No specific therapy is available for persons with acute hepatitis B; treatment is supportive. Persons with chronic HBV infection should be referred for evaluation to a provider experienced in the management of chronic HBV infection. There are several therapeutic agents cleared by FDA for treatment of chronic hepatitis B which achieve sustained suppression of HBV replication and remission of liver disease. Further, they can consult existing guidelines to learn about the latest advances in the management of hepatitis B.

HCV: Providers should consult with specialists knowledgeable about management of hepatitis C infection. Further, they can consult existing guidelines to learn about the latest advances in the management of hepatitis C.

B. Herpes Simplex Virus 1 & 2

Genital herpes is a sexually transmitted infection (STI) caused by the herpes simplex virus type 1 (HSV-1) or type 2 (HSV-2). Most people with the virus don't have symptoms. Even without signs of the disease, herpes can still be spread to sex partners.

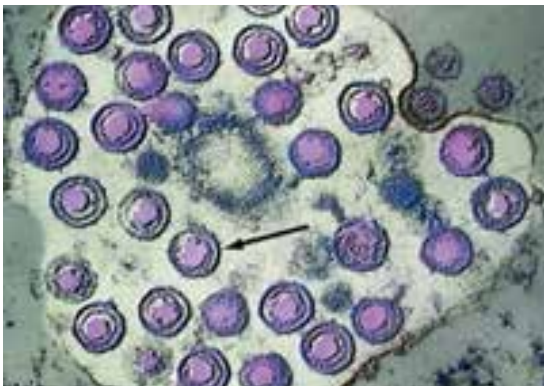


Figure-8: Herpes Simplex Virus 1

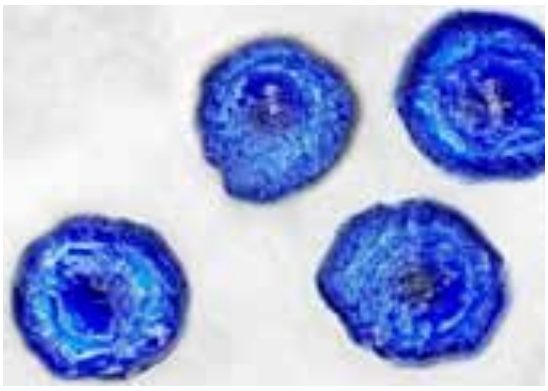


Figure-9: Herpes Simplex Virus 2

Incubation Period: The average incubation period for an initial herpes infection is 4 days (range, 2 to 12) after exposure.

Transmission: Infections are transmitted through contact with HSV in herpes lesions, mucosal surfaces, genital secretions, or oral secretions. HSV-1 and HSV-2 can be shed from normal-appearing oral or genital mucosa or skin. Generally, a person can only get HSV-2 infection during genital contact with someone who has a genital HSV-2 infection. However, receiving oral sex from a person with an oral HSV-1 infection can result in getting a genital HSV-1 infection. Transmission commonly occurs from contact with an infected partner who does not have visible lesions and who may not know that he or she is infected. In persons with asymptomatic HSV-2 infections, genital HSV shedding occurs on 10.2% of days, compared to 20.1% of days among those with symptomatic infections.

Clinical Features: Most individuals infected with HSV are asymptomatic or have very mild symptoms that go unnoticed or are mistaken for another skin condition. When symptoms do occur, herpes lesions typically appear as one or more vesicles, or small blisters, on or around the genitals, rectum or mouth. The vesicles break and leave painful ulcers that may take two to four weeks to heal after the initial herpes infection. Experiencing these symptoms is referred to as having a first herpes "outbreak" or episode. Clinical manifestations of genital herpes differ between the first and recurrent (i.e., subsequent) outbreaks. The first outbreak of herpes is often associated with a longer duration of herpetic lesions, increased viral shedding (making HSV transmission more likely) and systemic symptoms including fever, body aches, swollen lymph nodes, or headache. Recurrent outbreaks of genital herpes are common, and many patients who recognize recurrences have prodromal symptoms, either localized genital pain, or tingling or shooting pains in the legs, hips or buttocks, which occur hours to days before the eruption of herpetic lesions. Symptoms of recurrent outbreaks are typically shorter in duration and less severe than the first outbreak of genital herpes. Long-term studies have indicated that the number of symptomatic recurrent outbreaks may decrease over time. 5 Recurrences and subclinical shedding are much less frequent for genital HSV-1 infection than for genital HSV-2 infection.

Laboratory Diagnosis: Diagnosis of *Herpes Simplex* is confirmed by clinical presentation and laboratory tests.

Treatment

First clinical episode[90]:

Acyclovir 400 mg orally, 3 times daily for 10 days; or

Acyclovir 200 mg orally, 5 times daily for 10 days; or

Valaciclovir 1 gm orally, 2 times daily for 10 days or

Famciclovir 250 mg orally, 3 times daily for 10 days

* Treatment can be extended if healing is incomplete after 10 days of therapy.

Note: *for recurrent Herpes cases, the patient should be referred to appropriate facility/individual specialist for further management.*

C. Human Papilloma Virus

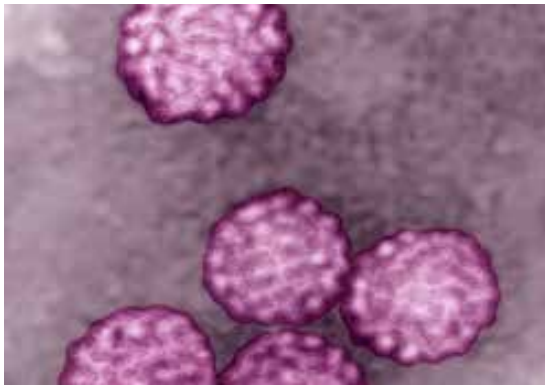


Figure-10: Human Papilloma Virus

Approximately 150 types of human papillomavirus infection (HPV) have been identified, at least 40 of which can infect the genital area. Most HPV infections are self-limited and are asymptomatic or unrecognized. Most sexually active persons become infected with HPV at least once in their lifetime. Oncogenic, high-risk HPV infection (e.g., HPV types 16 and 18) causes most cervical, penile, vulvar, vaginal, anal, and oropharyngeal cancers and precancers, whereas nononcogenic, low-risk HPV infection (e.g., HPV types 6 and 11) causes genital warts and recurrent respiratory papillomatosis. Persistent oncogenic HPV infection is the strongest risk factor for development of HPV-associated precancers and cancers. Anogenital warts were associated with HPV infection.

Incubation Period: Average incubation period for an initial herpes infection is 4 days (range, 2 to 12 days) after exposure.

Transmission: HPV is transmitted through intimate skin-to-skin contact. You can get HPV by having vaginal, anal, or oral sex with someone who has the virus. It is most commonly spread during vaginal or anal sex. HPV is so common that nearly all men and women get it at some point in their lives. HPV can be passed even when an infected person has no signs or symptoms. You can develop symptoms years after being infected, making it hard to know when you first became infected. In most cases, HPV goes away on its own and does not cause any health problems. Genital warts usually appear as a small bump or groups of bumps in the genital area. They can be small or large, raised or flat, or shaped like a cauliflower. A healthcare provider can usually diagnose warts by looking at the genital area. HPV cancers include cancer of the cervix, vulva, vagina, penis, or anus. HPV infection can also cause cancer in the back of the throat, including the base of the tongue and tonsils.

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Clinical Features: Human papillomaviruses (HPV) are a very common family of viruses that infect epithelial tissue of males and females. More than 150 HPV types have been identifed. Most HPV types infect cutaneous epithelial cells and cause common warts, such as those that occur on the hands and feet. Approximately 40 HPV types can infect mucosal epithelial cells, such as those on the genitals, mouth, and throat. Although most HPV infections are asymptomatic and resolve spontaneously or become undetectable, some HPV infections can persist and lead to cancer. Persistent infections with high-risk (oncogenic) HPV types can cause cervical, vaginal, and vulvar cancers in women; penile cancers in men and oropharyngeal and anal cancers in both men and women. High-risk types HPV 16 and 18 account for 80% of cancers caused by HPV. Infection with low-risk HPV types can cause genital warts and, rarely, laryngeal papillomas. These types can also cause benign or low-grade cervical cell abnormalities. Almost all genital warts and papillomas are caused by common low-risk types HPV 6 and 11. Almost every person will acquire an HPV infection at some time in his or her life. Currently, about 79 million Americans are infected with genital HPV. Approximately 14 million people become newly infected each year, mostly teens and young adults. Every year in the United States, an estimated 32,500 men and women are diagnosed with a cancer caused by HPV infection. Although cervical cancer is the most well-known of the cancers caused by HPV, HPV also causes approximately 20,000 non-cervical cancers every year in the United States. Even with screening and treatment, roughly 12,000 women are diagnosed with cervical cancer every year in the United States; subsequently, more than 4,000 women die every year from cervical cancer in the country.

Laboratory Diagnosis: Diagnosis of HPV is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section 7.

Treatment

Treatment is directed to the macroscopic or Pathological lesions caused by HPV. Subclinical genital HPV infection typically clears spontaneously, therefore no specific antiviral is needed. HPV related precancer should be managed according to existing guidelines

6.3 Protozoal agents

A. Trichomonas vaginalis

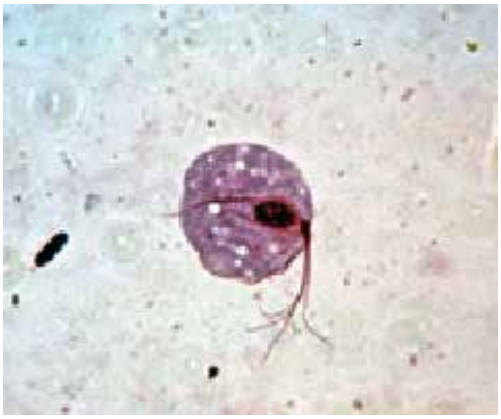

Figure-11: Trichomonas vaginalis

Vaginal Trichomoniasis is caused *Trichomonas vaginalis*. It is a flagellated protozoan that causes vaginitis and urethritis. Trichomonas vaginalis is found in the vagina, urethra, and paraurethral glands. In men infection is usually in the urethra.

Transmission: Close personal contact or sexual transmission is the main route of transmission.

Incubation period: 10 to 28 days

Clinical Features: Presentation of *Trichomonas vaginalis* infection: In females about 50% of cases Trichomonas vaginalis is infections are asymptomatic. The most common presenting symptoms are increased vaginal discharge, vulval itching, and painful urination, malodorous and smell fishy discharge, occasionally low abdominal discomfort. In males about 15 to 50% of men with Trichomonas vaginalis are asymptomatic and usually presented as urethral discharge, painful urination.

Laboratory Diagnosis: Diagnosis of *Trichomonas Vaginalis* is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section 7.

Treatment[91]:

Metronidazole: 2 gm orally as a single dose; Or

Metronidazole 500 mg 2 times daily for 7 days; Or

Tinidazole 2 gm orally as a single dose

6.4 Fungal agents

A. Candida species

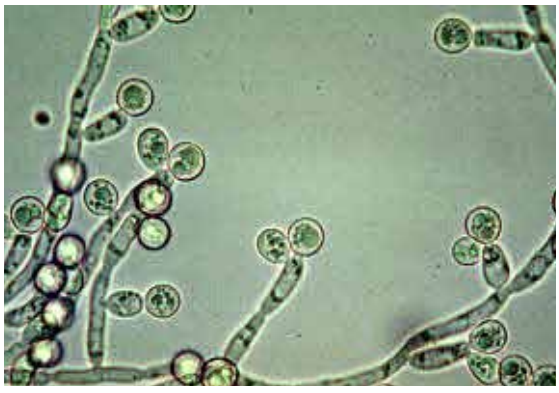

Figure-12: Candida albicans

Candida species are fungus and a normal flora of vaginal canal. Under certain conditions the number of Candida or certain species increases in the vaginal canal and produce a pathological condition call vaginal candidiasis. In 80 to 90% cases the species is *Candida albicans* (90%) and the rest may be Non-albicans species, for example, *Candida glabrata.*

Clinical features: Female: There are several clinical characteristics of vaginal candidiasis of which vulval itching, vulval soreness, vaginal discharge (white curd or cheese like), superficial dyspareunia, erythema, fissuring of skin. Male:

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Overt candidiasis of the genitalia is less common in males than in females. Some may develop a temporary rash, redness and itching of the glans penis within a few hours after sexual intercourse with an infected female with or without symptoms. This is self-limiting and disappears after washing. These male symptoms are thought to be a hypersensitivity reaction to candida.

Others may develop micro-papular lesions with diffuse redness of the glans penis and mucosal surplus of the prepuce or severe inflammation of the foreskin and glans in uncircumcised males with a cheesy exudate, fissuring oedema and foreskin problems, especially in patients with uncontrolled diabetes. There may be inflammation of the groin and scrotum and, very rarely, the urethra may be involved.

Laboratory Diagnosis: Diagnosis of candida is confirmed by clinical presentation and laboratory tests. Details of the laboratory investigations are described in section-7.

Treatment[92]:

Fluconazole* 150 mg orally as a single dose; or

Clotrimazole 1% cream 5 g intravaginally daily for 7–14 days; or

Clotrimazole 2% cream 5 g intravaginally daily for 3 days; or

Miconazole 2% cream 5 g intravaginally daily for 7 days; or

Miconazole 4% cream 5 g intravaginally daily for 3 days; or

Miconazole 100 mg vaginal suppository, one suppository daily for 7 days; or

Miconazole 200 mg vaginal suppository, one suppository for 3 days; or

Miconazole 1,200 mg vaginal suppository, one suppository for 1 day

6.5 Ectoparasites

A. Phthirus pubis (*Pubic lice*)

Phthirus pubis, the pubic or crab louse, is an insect of the order *Psocodea* and is an ectoparasite whose only host are humans. Adult pubic lice are 1.1–1.8 mm in length. Pubic lice typically are found attached to hair in the pubic area but sometimes are found on coarse hair elsewhere on the body (for example, eyebrows, eyelashes, beard, mustache, chest, armpits, etc.).

Transmission: Pubic lice infestations (pthiriasis) are usually spread through sexual contact. Dogs, cats, and other pets do not play a role in the transmission of human lice. Both over-the-counter and prescription medications are available for treatment of pubic lice infestations. The vernacular name comes from their crab like claws and body shape. Pubic ("crab") lice infestation is found worldwide and occurs in all races and ethnic groups and in all levels of society. Pubic lice usually are spread through sexual contact and are most common in adults. Occasionally pubic lice may be spread by close personal contact or contact with articles such as clothing, bed linens, and towels that have been used by an infested person. Pubic lice found on the head or eyelashes of children may be an indication of sexual exposure or abuse. Pubic lice do not transmit disease; however, secondary bacterial infection can occur from scratching of the skin.

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Figure 13: Phthirus pubis

Clinical Features: Pubic ("crab") lice are not known to transmit any disease. Itching ("pruritus") in the pubic and groin area is the most common symptom of pubic lice infestation. As with other lice infestations, intense itching leads to scratching which can cause sores and secondary bacterial infection of the skin. Visible lice eggs ("nits") or lice crawling or attached to pubic hair, or less commonly other hairy areas of the body (eyelashes, eyebrows, beard, mustache, armpits, chest, back) are other signs of pubic lice infestation. Pubic lice on the head (eyelashes or eyebrows) of a child may be an indication of sexual exposure or abuse. Persons infested with pubic lice should be evaluated for other sexually transmitted diseases (STDs).

Laboratory Diagnosis: Pubic lice are short and crab-like and appear very different from head and body lice. It is diagnosed by binding a 'crab' louse on eggs on hair in the pubic region.

Treatment[93]

Recommended Regimens: Permethrin 1% cream rinse applied to affected areas and washed off after 10 minutes, Or

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

Alternative Regimens

Malathion 0.5% lotion applied to affected areas and washed off after 8–12 hours. The recommended regimens should not be applied to the eyes. Pediculosis of the eyelashes should be treated by applying occlusive ophthalmic ointment or petroleum jelly to the eyelid margins twice a day for 10 days. Bedding and clothing should be decontaminated (i.e., machine-washed and dried using the heat cycle or dry cleaned) or removed from body contact for at least 72 hours. Fumigation of living areas is not necessary. Persons with pediculosis pubis should be evaluated for other STDs, including HIV.

Note: Reported resistance to pediculcides (permethrin and pyrethrins) has been increasing and is widespread. Malathion can be used when treatment failure is believed to have occurred as a result of resistance. The odor and long duration of application associated with malathion therapy make it a less attractive alternative compared with the recommended pediculcides.

B. Sarcoptes scabiei var. hominis

Sarcoptes scabiei var. hominis, the human itch mite, is in the arthropod class Arachnida, subclass Acari, family Sarcoptidae. The mites burrow into the upper layer of the skin but never below the stratum corneum. The burrows appear as tiny raised serpentine lines that are grayish or skin-colored and can be a centimeter or more in length. Other races of scabies mites may cause

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infestations in other mammals, such as domestic cats, dogs, pigs, and horses. It should be noted that races of mites found on other animals may cause a self-limited infestation in humans with temporary itching due to dermatitis; however, they do not multiply on the human host.

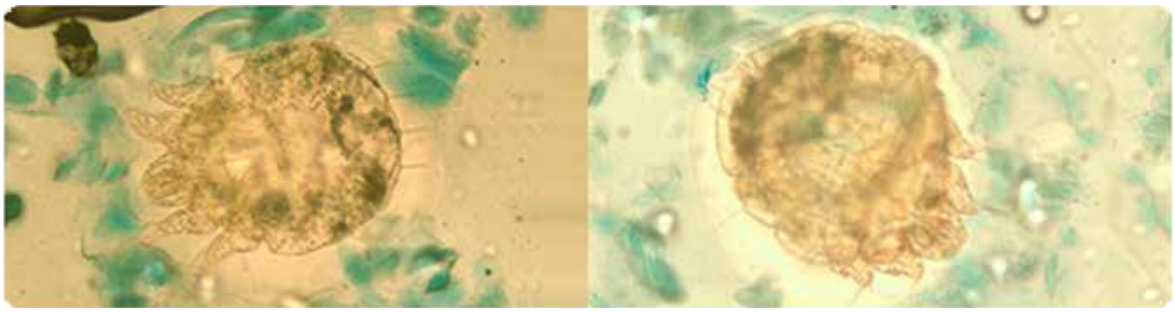

Figure 14: Sarcoptes scabiei var. hominis

Human scabies: Human scabies is caused by an infestation of the skin by the human itch mite (Sarcoptes scabiei var. hominis). The microscopic scabies mite burrows into the upper layer of the skin where it lives and lays its eggs. The most common symptoms of scabies are intense itching and a pimple-like skin rash. The scabies mite usually is spread by direct, prolonged, skin-to-skin contact with a person who has scabies. Scabies occurs worldwide and affects people of all races and social classes. Scabies can spread rapidly under crowded conditions where close body contact is frequent. Institutions such as nursing homes, extended-care facilities, and prisons are often sites of scabies outbreaks.

Transmission: Human scabies is caused by an infestation of the skin by the human itch mite (Sarcoptes scabiei var. hominis). The adult female scabies mites burrow into the upper layer of the skin (epidermis) where they live and deposit their eggs. The microscopic scabies mite almost always is passed by direct, prolonged, skin-to-skin contact with a person who already is infested. An infested person can spread scabies even if he or she has no symptoms. Humans are the source of infestation; animals do not spread human scabies.

Persons at Risk: Scabies can be passed easily by an infested person to his or her household members and sexual partners. Scabies in adults frequently is sexually acquired. Scabies is a common condition found worldwide; it affects people of all races and social classes. Scabies can spread easily under crowded conditions where close body and skin contact is common. Institutions such as nursing homes, extended-care facilities, and prisons are often sites of scabies outbreaks. Child care facilities is also a common site of scabies infestations.

Clinical features: When a person is infested with scabies mites the first time, symptoms usually do not appear for up to two months (2-6 weeks) after being infested; however, an infested person still can spread scabies during this time even though he/she does not have symptoms. If a person has had scabies before, symptoms appear much sooner (1-4 days) after exposure. An infested person can transmit scabies, even if they do not have symptoms, until they are successfully treated and the mites and eggs are destroyed. The most common symptoms of scabies, itching and a skin rash, are caused by sensitization (a type of "allergic" reaction) to the proteins and feces of the parasite. Severe itching (pruritus), especially at night, is the earliest and most common symptom of scabies. A pimple-like (papular) itchy (pruritic) "scabies rash" is also common. Itching and rash may affect much of the body or be limited to common sites such as: Between the fingers, Wrist, Elbow, Armpit, Penis, Nipple, Waist, Buttocks, Shoulder blades. The head, face, neck, palms, and soles often are involved in infants and very young children, but usually not adults and older children. Tiny burrows sometimes are seen on the skin; these are caused by the female scabies mite tunneling just beneath the surface of the skin. These burrows appear as tiny raised and crooked (serpiginous) grayish-white or skin-colored lines on the skin surface. Because mites are often few in number (only

10-15 mites per person), these burrows may be difficult to find. They are found most often in the webbing between the fingers, in the skin folds on the wrist, elbow, or knee, and on the penis, breast, or shoulder blades.

Possible Complications: The intense itching of scabies leads to scratching that can lead to skin sores. The sores sometimes become infected with bacteria on the skin, such as Staphylococcus aureus or beta-hemolytic streptococci. Sometimes the bacterial skin infection can lead an inflammation of the kidneys called post-streptococcal glomerulonephritis.

Laboratory Diagnosis

Diagnosis of a scabies infestation usually is made based upon the customary appearance and distribution of the rash and the presence of burrows. Whenever possible, the diagnosis of scabies should be confirmed by identifying the mite or mite eggs or fecal matter (scybala). This can be done by carefully removing the mite from the end of its burrow using the tip of a needle or by obtaining a skin scraping to examine under a microscope for mites, eggs, or mite fecal matter (scybala). However, a person can still be infested even if mites, eggs, or fecal matter cannot be found; fewer then 10-15 mites may be present on an infested person who is otherwise healthy.

Treatment[94]

Recommended Regimens

Permethrin 5% cream applied to all areas of the body from the neck down and washed off after 8–14 hours; Or Ivermectin 200 μg/kg orally, repeated in 2 weeks

Alternative Regimens

Lindane (1%) 1 oz of lotion or 30 g of cream applied in a thin layer to all areas of the body from the neck down and thoroughly washed off after 8 hours

Note: Infants and young children should be treated with permethrin. Infants and young children aged <10 years should not be treated with lindane. Permethrin is effective, safe, and less expensive than ivermectin. Bedding and clothing should be decontaminated (i.e., either machine-washed, machine-dried using the hot cycle, or dry cleaned) or removed from body contact for at least 72 hours. Fumigation of living areas is unnecessary. Persons with scabies should be advised to keep fingernails closely trimmed to reduce injury from excessive scratching.

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Section-7
Laboratory diagnosis of STIs

In general, laboratory tests are not undertaken for most STI patients who receive syndromic management. However, it may be appropriate to take specimens for laboratory testing from those patients failing first-line therapies, to establish diagnoses and/or to determine if treatment failure was due to antimicrobial resistance. In the set up that can afford the etiological diagnostic approach, the laboratory plays a much greater role in terms of diagnosis of specific STI pathogens and determination of antimicrobial susceptibility.

7.1 Different types diagnostic tests for STIs detection

Firstly, direct detection of microorganisms themselves is the most obvious approach to STI diagnosis. This may be accomplished through the use of microscopy and appropriate staining or wet preparation to visualize pathogens. Culture, antigen detection, or nucleic acid detection using either amplified or non-amplified nucleic acid detection tests are often more sensitive than microscopy but may have more complex technical requirements for optimal test performance and may increase the interval between testing and the availability of test results (rapid POC tests help to overcome the latter potential limitation). Each of these approaches has its own strengths and weaknesses. Microscopy, particularly when performed while patients are present, may provide immediate results to guide management decisions but like other tests, requires specialized equipment (the microscope), may require electrical power or special stain procedures, and is dependent on the training and experience of the microscopists.

In contrast, other laboratory-based tests, such as culture or nucleic acid amplification testing, may require special methods of specimen transport and specialized equipment and procedures for optimal performance, thus delaying the availability of results for immediate management decisions.

Secondly, for many important STIs (syphilis and HIV represent common examples), detection of the host response to infection (antibodies) represents a favored diagnostic test. The strength of serological tests is that they may be useful not only for purposes of diagnosis but also for surveillance. All serological tests have occasional false-positive test results. The problem of false-positive serological tests can often be reduced by testing specimens found to be positive on an initial, screening serological test using a second, confirmatory serologic test, which targets a different antigen (use of confirmatory tests is discussed in more detail in the sections on syphilis and HIV serological testing). Some serological tests may be able to differentiate recently acquired infections from more longstanding or previously treated infections through detection of immunoglobulin M (IgM) for recent infections. A shortcoming of serological diagnosis is that antibodies to an STI pathogen may persist long after successful treatment. As such, serological testing of populations may be an indication of total cumulative infection rather than more recently acquired infections.

Thirdly, there are tests that detect microbial metabolites, such as materials altering the pH of genital secretions and biogenic amines. These tests are useful adjuncts for diagnostic purposes in some settings. An example of this is the importance of pH and whiff/amine tests in the diagnosis of bacterial vaginosis.

7.2 Specimen collection for laboratory diagnosis of STIs

For the laboratory diagnosis of STIs, appropriate clinical specimen collection, as well as specific laboratory tests advice is important to get reliable test results.

Specimens usually collected from the following sites:

7.2.1 Vulva/penile lesions

Many sexually transmitted diseases have manifestations at the external genitalia, though the collection technique differs for them.

1. Syphilis (Chancre) - clean the surface of any lesion with sterile normal saline. If there is a crust, gently remove it. Abrade the lesion until serous fluid (not blood) emerges. Wipe away fluid and debris with sterile gauze. Press the base of lesion until clear fluid is expressed. Touch a clean microscope slide to the fluid and cover with a cover slip. Send for dark-field microscopy immediately.
2. Herpes simplex virus - aspirate vesicular fluid with a hypodermic needle and immediately put it into virus transport medium or unroof the vesicle and collect fluid with a swab into transport medium.
3. Chlamydia trachomatis (lymphogranuloma venereum) - disinfect skin thoroughly. Aspirate the lymph nodes and send for cell culture.
4. Haemophilus ducreyi (chancroid) - clean the lesions with sterile normal saline. Moisten the swab with sterile saline and swab the lesion base. Specify for its culture if clinically indicated.
5. Molluscum contagiosum and condyloma acuminata - punch biopsy for histological examination if necessary.

7.2.2 Bartholin gland

Disinfect the skin with povidone iodine. In the early stage of bartholinitis, try to express secretions from the openings of the glands. Collect the exudates with a swab or a syringe. With the formation of abscess, aspirate material from the gland with a syringe.

7.2.3 Vagina

1. Secretions high in the posterior vagina fornix (not the external vaginal orifice) is used for the diagnosis of a number of pathogens, including Trichomonas vaginalis, Candida albicans, and bacterial vaginosis. A swab ("high vaginal swab") is generally more convenient to obtain aspiration of the secretions. Use a speculum without lubricant (except normal saline).
2. In case of suspected bacterial vaginosis, send two swabs: one with transport medium (for culture) and one without transport medium (for Gram smear and to look for the presence of clue cells).
3. For culture of Listeria monocytogenes and Group B Streptococcus, a mucosal swab of the vaginal wall is sufficient.

7.2.4 Cervix/endocervix

1. Use a speculum without lubricant. Wipe the cervix clean of vaginal secretions and mucus. Gently insert a swab into the endocervical canal 2-3cm and rotate to obtain any exudate. For C. trachomatis, rotate more firmly to obtain cervical cells.
2. In patients with intra-uterine contraceptive device (IUCD) in situ and suspected pelvic inflammatory disease, scrape or swab any visible lesions on the cervix or endocervix and send it for Actinomyces. Send also the IUCD for culture if removal is feasible.

7.2.5 Urethra

In both the male and female, this is usually taken for the detection of *N. gonorrhoeae* or *C. trachomatis*. Collect specimens at least 1 hour after the patient has urinated. Clean the urethral orifice with sterile saline. Gently massage the urethra against the pubic symphysis in the female to stimulate secretion and discharge. If no discharge can be obtained, insert a thin swab into the urethra and gently rotate the swab. Withdraw and put into the transport medium of the swab. Transport the swab to the laboratory immediately as *N. gonorrhoeae* loses viability quickly. Send another swab for *C. trachomatis* immunofluorescence staining and culture in appropriate transport medium.

7.2.6 Rectal Swab Specimen Collection

A rectal swab is used to detect rectal carriage and infection due to *N. gonorrhoeae* and sometimes herpes simplex virus. Pass the tip of a sterile swab approximately 2.5 cm beyond the anal sphincter. Rotate the swab gently and withdraw it into the appropriate transport medium.

7.2.7 Endometrium

Collect endometrium specimens by transcervical aspiration through a telescoping catheter.

7.2.8 Pharyngeal swab

Collect swab from posterior pharyngeal wall and tonsils by rolling the swab over there.

7.2.9 Serum Sample

For serological test 5 ml blood collected in a plain tube and send laboratory.

7.2.10 Transport media

Amies transport media: for the clinical specimens may contain Gonococcus, Mycoplasma, Chlamydia, Ureaplasma and bacterial vaginosis

Stuarts media: for the clinical specimens may contain Gonococcus

7.3 Trichomonas vaginalis (Trichomoniasis)

Specimen: High vaginal swab (HVS)

Technique: Wet mount examination of vaginal secretion for *Trichomonas vaginalis*

Materials required:

- Light Microscope (Eyepiece: 10X, Objectives: 10X, 40X, 100X)
- Cotton-tipped swab
- Normal saline in a dropper
- Coverslips (22x22mm)
- Microscope glass slides
- Plain Forceps

Procedure:

1) The sample should be collected from the posterior vaginal fornix (upper part) or from the man's urethra using sterile cotton tip.
2) Put one or two drops of normal saline on a glass slide.
3) Place the vaginal fluid containing swab into normal saline solution on glass slide to make a suspension
4) Cover the wet preparation with a cover slip
5) Examine the wet mount preparation immediately at X100 magnification and then at X400 magnification for motile flagellates

Microscopic finding: *Trichomonas vaginalis* are

- Motile (remains motile for several hours)
- Flagellate

In the clinical specimen their characteristic nervous, jerky and jumpy movements under xl0 objective can identify flagellates.

Morphology of *Trichomonas vaginalis* is,

Size: 10-20 μm (Slightly larger than polymorph)

Shape: round, globular

Flagella: whip like. Motile

Undulating membrane like fish fins.

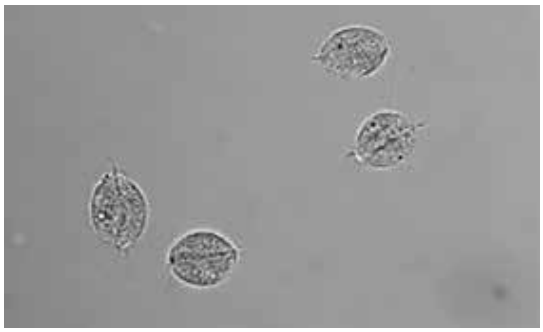


Figure-1: Trichomonas vaginalis in wet vaginal swab light microscopy X400

7.4 Candida yeast and hyphae (Candidiasis)

Specimen: High vaginal swab (HVS) or lumpy discharge around head of the penis.

Technique: Wet mount and 10% potassium hydroxide (KOH) examination.

Materials required:

- Light Microscope (Eyepiece: 10X, Objectives: 10X, 40X, 100X)
- Cotton-tipped swab
- KOH solution
- Cover slips (22x22mm)
- Microscope glass slides
- Plain Forceps

Procedure:

- Put one or two drops of KOH on a glass slide.
- Collect the vaginal swab by rubbing the swab against the vaginal wall or swab around glans penis.
- Make a suspension on glass slide with collected swab.
- Cover the suspension with a cover slip.
- Examine microscopically at x40 and x100 objectives to detect candida yeast and hyphae.
- Examine the slide immediately.

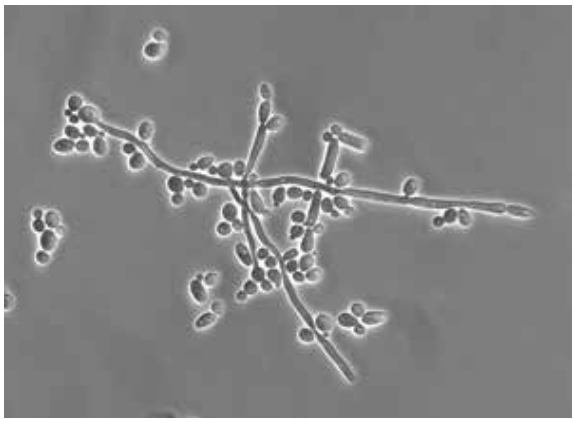


Figure-2: Light microscopic view of Candida yeast and hyphae (1000X).

Microscopic findings:

Microscopic examination reveals 5-10 μm diameter round or oval yeast cells and also possible to observe the budding yeasts along with elongated hyphae.

7.5 Gardnerella vaginalis, Bacteroids spp. (Bacterial vaginosis)

Bacterial vaginosis (BV) is characterized by a shift in the vaginal flora from the dominant lactobacillus spp. to a mixed vaginal flora that includes *Gardnerella vaginalis*, Bacteroids spp., Mobiluncus spp., and *Mycoplasma hominis*.

Laboratory techniques used for detection of bacterial vaginosis are:

A. Wet mount examination of vaginal secretion for Clue cells
B. Whiff test of vaginal secretion
C. pH measurement of vaginal secretion
D. Gram staining for Bacterial Vaginosis

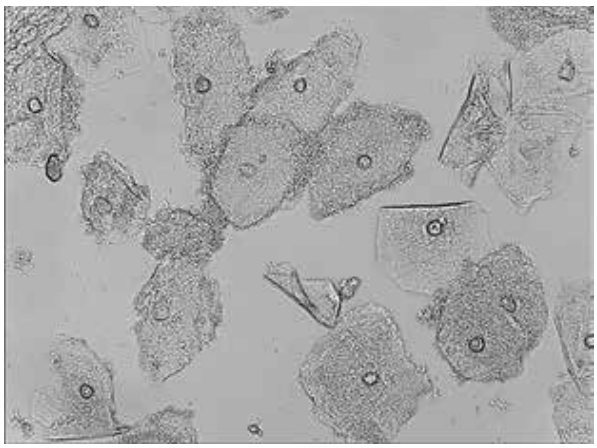


Figure-3: Clue cells microscopic feature in normal saline wet preparation

A. Wet mount examination of vaginal secretion for Clue cells:

Specimen: High vaginal swab

Materials required:

- Light Microscope (Eyepiece: 10X, Objectives: 10X, 40X, 100X)
- Cotton-tipped swab
- Saline in a dropper.
- Cover slips (22x22mm)
- Microscope glass slides
- Plain Forceps

Procedure:

- Put one or two drops of normal saline on a glass slide.
- Collect the vaginal secretion by rubbing the swab against the vaginal wall
- Make a suspension of vaginal secretions with normal saline
- Cover the suspension with a coverslip.
- Examine the preparation microscopically at x 1000 magnifications.

Microscopic finding:

The normal vaginal squamous epithelial cells have distinct cell margins and lack granularity. Clue cells are seen as squamous epithelial cells with a large number of coccobacillary organisms densely attached in clusters to their surfaces, giving them a granular appearance. The edges of squamous epithelial cells, which normally have a sharply defined cell border, become indistinct or stippled. In most patients with BV, a mixture of normal exfoliated vaginal epithelial cells and 20% or more clue cells will be seen.

B. Whiff test of vaginal secretion:

Materials required:

- Cotton-tipped swab
- Saline in a dropper
- KOH solution.
- Glass slide

Procedure:

1. Take one or two drops of normal saline on a glass slide.
2. Make a suspension of vaginal secretions by using the HVS.
3. Add a drop of KOH.
4. Hold the slide close to the nose to detect the amine odor (musty dead fishy odor).

C. pH measurement of vaginal secretion:

Materials required:

- Cotton-tipped swab
- pH indicator paper (range: 4-7)

Procedure:

1. Collect the vaginal secretion on a swab by rubbing against the vaginal wall or touching the pH paper to the up of the speculum that contains vaginal discharge after it has been removed from the vagina.
2. The normal mature vagina has an acid pH of 4.0.
3. In BV, the pH generally is elevated to >4.5.

Interpretation of results through 3 techniques: BV is positive if three of the following criteria are present this is known as **Amsel Criteria**:

- a thin homogenous vaginal discharge
- vaginal pH > 4.5
- a positive amine test (fishy odor after the addition of potassium hydroxide to the vaginal discharge on a slide) and the presence of clue cells (clue cells comprise more than of epithelial cells).

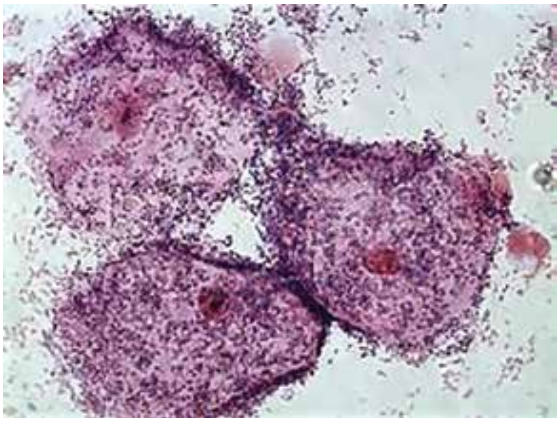


Figure-4: Gram stained vaginal smear microscopy shows clue cells in absence of Lactobacilli and pus cells.

Note: *Puberty to menopause vaginal pH is Acidic: after menopause, vaginal pH is Alkaline.*

D. Gram staining for Bacterial Vaginosis (BV)

Morphology and Gram staining properties of vaginal secretions under microscope in BV:

1. ***Lactobacilli:*** vary greatly in size but are generally large, straight or curved rods. They are Gram-positive bacilliand their number reduced significantly in BV.
2. ***Pus cell:*** are usually absent in BV.
3. **Clue cells:** squamous epithelial cells studded with Gram negative coccobacilli and epithelial cell margins are obscured usually.
4. ***Gardnerella vaginalis:*** These are Gram negative or Gram variable, pleomorphic coccobacilli or bacilli that average 0.5 μm in diameter and 1.5 to 2.5 μm in length.
5. **Mobiluncus:** Short or long hook like, curved Gram-positive organism even though they usually stain as Gram-negative rods.

Nugent method for diagnosis of BV

This method relies on scoring of individual types of organisms; a score of 0 to 10 is derived from a weighted combination of the following: large Gram-positive rods (lactobacilli), small Gram-negative or Gram-variable rods (*G. vaginalis* or other anaerobes), and curved Gram- negative or Gram-variable rods (*Mobiluncus spp.*). Each of these three groups is quantitatively weighted on a score of 0–4 on a smear described in Box-1,

Plenty of lactobacilli morphotypes on a smear is considered normal; thus, lactobacilli scores are inversely related to their number. 4+ lactobacillus scores 0, 3+ scores 1, etc. The scores for Gardnerella and Mobiluncus morphotypes correlate to the number of organisms. 4+ Gardnerella scores 4, etc. Mobiluncus are weighted lower; thus, 1+ and 2+ scored organisms score 1, and 3+ and 2+ score 2.

Box-1: Score used in Nugent method
0 = no morphotype per oil field
1+ = less than 1 morphotype per oil field
2+ = 1 to 4 morphotypes per oil field
3+ = 5 to 30 morphotypes per oil field
4+ = more than 30 morphotypes per oil field

A diagnosis of "severe BV" scores 10 (4 for absence of lactobacilli morphotypes, 4 for 4+ Gardnerella morphotypes, and 2 for 4+ Mobiluncus morphotypes). A "normal" vaginal Gram smear scores 0 (0 for 4+ lactobacilli morphotypes, 0 for 0 Gardnerella morphotypes and 0 for 0 Mobiluncus morphotypes).

In Nugent's score, a total score of 7 to 10 (the sum of the rating scores of the 3 groups described above) is indicative of BV, a score of 4 to 6 intermediate flora, and 0 to 3 normal floras.

7.6 Neisseria gonorrhoea (Gonorrhoea)

Laboratory diagnosis of *Neisseria gonorrhoea* infection is mainly depends on-

A. Gram staining &

B. Culture

A. Gram staining

Specimen:

1. Cervical swab
2. Male urethral discharge
3. Prostatic smear
4. Rectal or pharyngeal swab
5. Conjunctival swab in ophthalmia neonatorum

Materials required:

- Light Microscope (Eyepiece: 10X, Objectives: 10X, 40X, 100X)
- Cotton tipped swab
- Gram staining solutions: Crystal violet, Gram's iodine, decolorizer (50/50 mixture of 95 % ethanol with acetone, and safranine.
- Sink or staining tray with water source
- Immersion oil
- Microscope slides
- Plain Forceps
- Bunsen flame or alcohol lamp

Preparation for the smear

1. Roll the collected swab specimen on the glass slide.
2. Let the smear air-dry for few minutes
3. Fix the slide with methanol and air dry

Gram staining technique:

- Flood the slide with Crystal violet for 30-60 sec; rinse with a gentle stream of tap water.
- Flood the slide with Grams iodine for 1 min. then rinse with a gentle stream of tap water.
- Rinse the slide with decolorizing solution until purple color no longer runs from the thinnest part of the smear.
- Flood the slide with Safranine for 1 min. then rinse with tap water.
- Allow the smear air-dry.

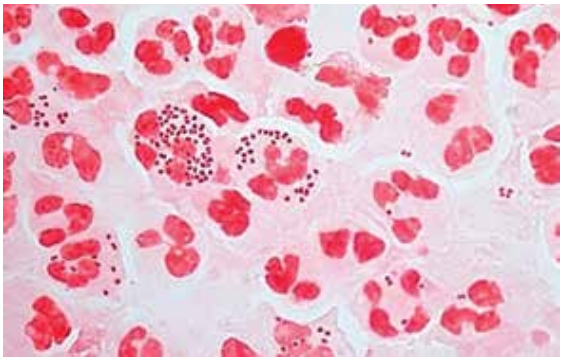


Figure-5: Gram staining findings of gonococcal urethritis-Gram negative intra and extra-cellular diplococci with numerous pus cells

Microscopic examination:

- Place a drop of immersion oil on the stained smear
- Examine under 100X objective to search for organisms and polymorphonuclear cells.
- Gram negative intracellular and extracellular diplococci (Neisseria) stain red. Polymorphonuclear cells stain red.

Interpretations:

Gonococcal infection: Gram stain of clinical specimens demonstrating the presence of Gram-negative diplococci within and outside the polymorphonuclear leukocytes.

Non-specific infection: Gram stain of clinical specimens demonstrating few polymorphonuclear leukocytes without Gran-negative diplococci.

Note: *A slide should be examined thoroughly before concluding it does not contain any Gram-negative diplococci.*

Errors:

- Failure to methanol fixation may cause material to wash off during staining.
- Scrubbing the swab rather than rolling will destroy cellular morphology.
- Smear thickness on the glass slide should be optimized.
- Patient should not urinate for 2 hours before the urethral specimen is collected.

B. Culture for identification of *N. gonorrhoeae*:

When the daily number of patient attendance with genital discharge is sufficiently high, culture of *N. gonorrhoeae* can be considered in the laboratories with the facilities.

Materials required:

- Selection medium for *N. gonorrhoea* (eg. Thayer Martin, Chocolate agar)
- 37°C incubator
- Candle jar
- Petri dish
- Transport media (Amies medium is the most efficient for transporting urethral, cervical and other swabs. Specimens should be transported in a cool box)

Procedure for inoculation:

1. The swab is directly plated onto a selective culture medium to a 1 cm circular area of the plate by rubbing the surface of the medium.
2. Streak out the inoculum on the whole plate with the inoculating loop.
3. Incubate in a humid environment of air containing 3-5% CO2 at 35°C for at least 48 hours.
4. Examine the plate for visible growth after 24-48 hours.

Figure-6: Candle jar

Note: *When there is delay for inoculation in selective media, during that time transport media should be used.*

Culture characteristics:

N. gonorrhoea produces small raised, grey shiny colonies on Chocolate agar and Thayer Martin media. Further tests needed with the colony found on the surface of the media for the identification of *N. gonorrhoea.*

- Oxidase test: *N. gonorrhoea* is strongly oxidase positive.
- Gram stain: *N. gonorrhoea* reveals Gram negative diplococci.
- Test the colonies for positive beta-lactamase production.

Figure-7: N. gonorrhoea colony on chocolate agar media

7.7 Treponema pallidum (Syphilis)

The most commonly applied methods for the identification of syphilis are serological methods that depend on the detection of serum antibodies. The common serological techniques are RPR (rapid plasma regain card test), and VDRL (Venereal Disease Research Laboratory) test. Specific tests are TPHA (*Treponema pallidum* hemagglutination assay) and FTA-ABS (Fluorescence *T. pallidum* Antibody absorption test).

A. Serological tests for Syphilis:

Two-step serological testing is required for the diagnosis of syphilis. A nontreponemal screening test is initially done using cardiolipin-lecithin- cholesterol antigen to detect cross-lipid antibodies produced in response to infection with Treponema pallidum (The rapid plasma reagin [RPR]card test). If Positive, the RPR test result is confirmed by a more specific, treponemal antigen-based test like TPHA (Treponema pallidum hemagglutination assay). The RPR test is a sensitive but nonspecific treponemal screening test for syphilis. It is positive in late primary syphilis and stages thereafter.

After treatment, the RPR test usually soon becomes negative except when treatment is instituted in the late secondary or tertiary stage. In some cases of apparently untreated latent syphilis it may eventually become negative. A positive RPR test result indicates active treponemal disease if a biological false-positive reaction can be excluded by a specific treponemal test like TPHA. Serum samples that are positive in nontreponemal tests but not in confirmatory treponemal tests are referred to as biologic false-positive (BFP) reactions. Confirmatory treponemal tests like TPHA are expensive and require more technical expertise compared to nontreponemal test.

VDRL and RPR test

There are two common tests under the nontreponemal test. They include VDRL (Venereal Disease Research Laboratory) and RPR (Rapid Plasma Reagin) test. These two tests are performed in the same way. However, they have a number of differences. VDLR was a test developed by the Venereal Disease Research Laboratory during World War I. This test is still done today to detect syphilis. On the other hand, RPR was developed as a more advanced VDRL. RPR is just the VDRL antigen, but it contains carbon or delicately divided charcoal particles. With these charcoal particles, it allows the visualization of the reaction or flocculation between the specimen and the antigen without the use of a microscope. RPR tests can be done without the use of a microscope; the result can be seen by our naked eye. In contrast, a VDLR test requires a microscope to know the results of the test. RPR, is the most preferred syphilis test by many for it is easy to use and can be readily purchased in a kit form in contrast to the VDRL.

Both the RPR and VLDR tests use blood as the specimen to detect syphilis. However, in the late stages of syphilis, it involves the central nervous system or what is termed as neurosyphilis. A VDLR is the only test that can be performed using CSF or cerebrospinal fluid. During the testing for syphilis, the specimen that will be used for a VDLR requires it to be heated before it can be tested. VDLR tests also require that the specimen must be freshly collected. However, in an RPR test, the specimen does not need to be heated or unheated before it can be tested for syphilis. According to research, the RPR test is the more effective nontreponemal test than the VDLR. It can detect syphilis more effectively than a VDLR.

Rapid Plasma Reagin (RPR) Test

The RPR detects antibodies; react with cardiolipin, a lipoidial antigen made from beef hearts. The RPR can give false results with other treponemal infections (non-syphilitic conditions), pregnancy, malaria, leprosy, tuberculosis, viral pneumonia, autoimmune disorder, etc.

Materials required:

- RPR card kit, generally contains:
  - The RPR card antigen suspension
  - Needle and antigen dispensing bottles
  - RPR cards
  - RPR control sera (positive and negative controls)
  - Serological pipettes
- Card test rotator
- Refrigerator: RPR kits are stored at 2-8°C.

Specimen: Plasma or serum separated from blood

Test procedure:

(Different brands of RPR kits are commercially available. The instruction of the manufacturer must be followed carefully. Storage of the RPR antigen at specific temperatures up to three month does not affect its stability provided that the product does not exceed the expiry date)

All materials and specimens are warmed up to room temperature (23-28°C)

- One drop of reagent is added to equal volume of serum or plasma on the supplied card
- The serum and reagents are mixed with stick
- The card is rotated for 8 minutes at 100rpm or as per manufacturer's instruction
- The reading is taken in bright light

Interpretation:

Reactive: Visible clump

Non-reactive: No visible clump

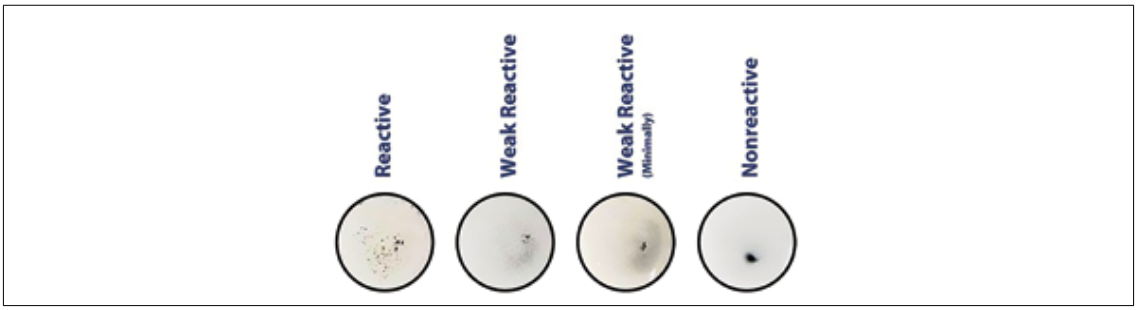


Figure-8: RPR card test results

A Positive test is characterized by clumping of the particles.

Procedure for RPR semi quantitative test:

The samples that tested positive for qualitative RPR were retested using a semi-quantitative RPR method my help in the treatment prognosis follow up. Some times excess antibody present in serum (prozone phenomenon) affects the RPR test results with the undiluted serum and made the result false negative in spite of strong clinical prediction. It can overcome by doing the semi quantitative RPR test. Semi quantitative testing is a measurement of the amount of a substance present in the positive sample either to guide treatment or to quantify the infection.

Test procedure:

- Place 50 μl of 0.9% saline solution in 2nd, 3rd, 4th and 5th circles of the card by using micropipette. Do not spread the saline solution.
- Using Micropipette add 50 μl sample to saline in 1st and 2nd circle. Mix sample in saline in 2nd circle by drawing the mixture up and down for 8 times in micropipette. Avoid bubble formation.
- Aspirate 50 μl from 2nd circle and transfer to 3rd circle. Repeat the same successively upto 5th circle.
- Aspirate 50 μl from the 5th circle and discard it.
- Perform as mentioned in qualitative test for each of diluted sample drop.
- The end point is the highest dilution showing visual black clumps.

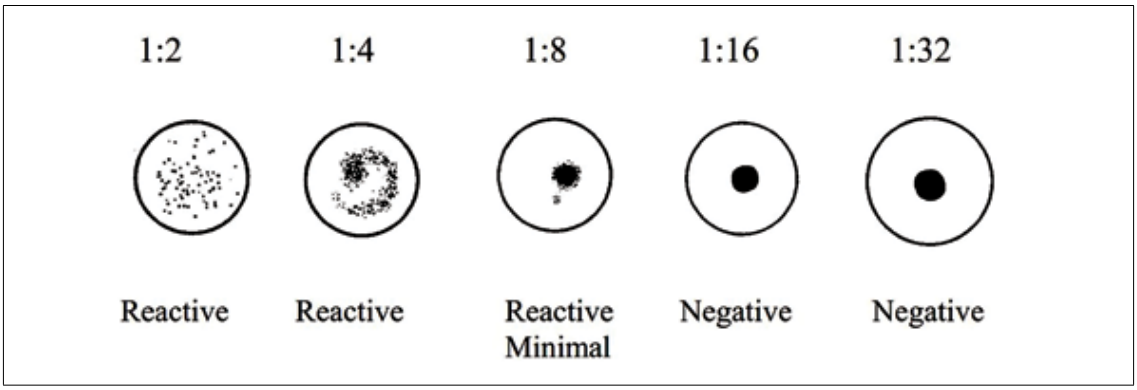


Figure-9: Semi quantitative RPR test

A Positive test is characterized by clumping of the particles in the specific titer.

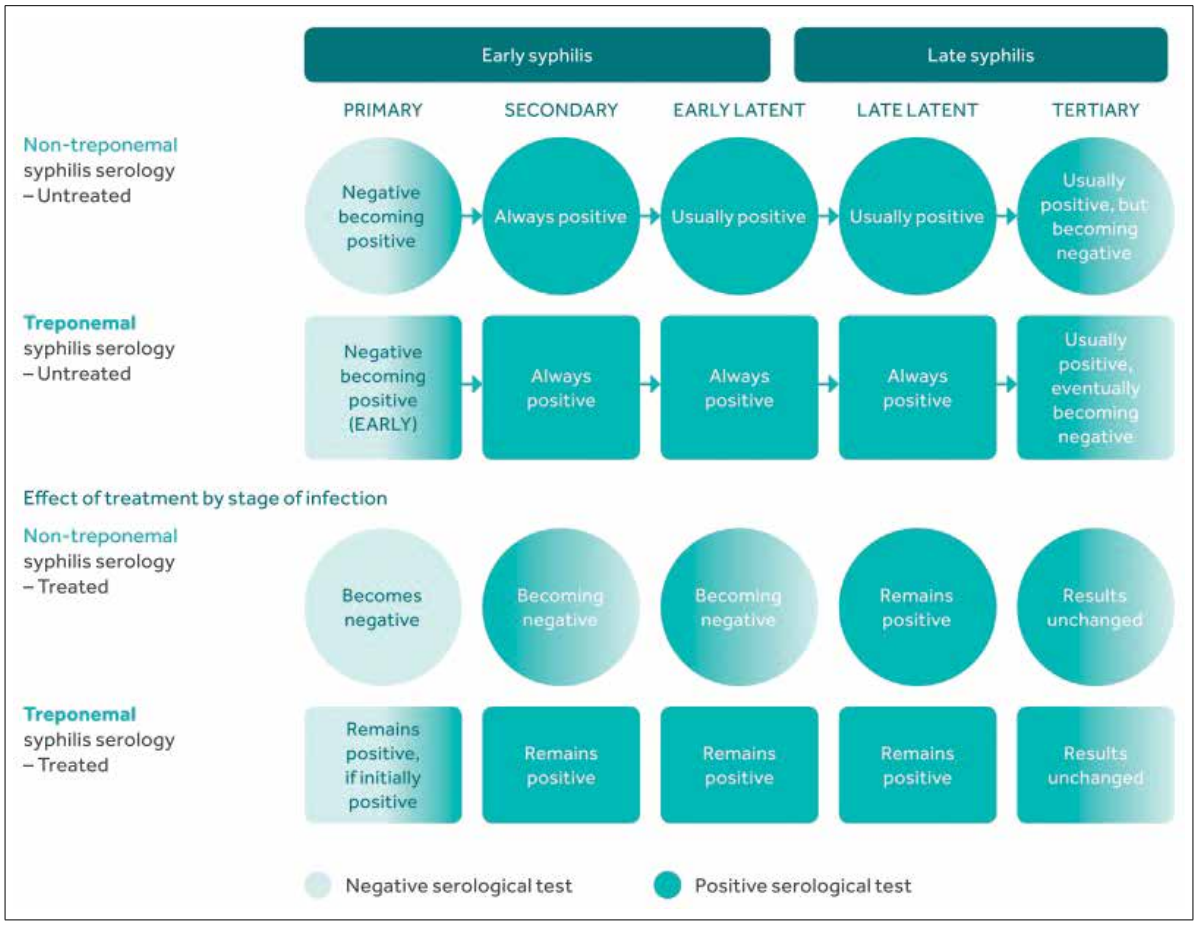


Figure-10: Reactivity of serological tests by stage of syphilis and effect of treatment

Treponema Pallidum Hemagglutination Assay (TPHA)

All the qualitative RPR positive samples were retested with TPHA to confirm their positivity.

Test procedure:

- Allow samples and reagents to reach room temperature and ensure that samples and all reagents are fully resuspended before use.
- Each test requires 4 wells of a microtitre plate. Dispense Diluent into the microtitration plate as follows: 25 μl in rows 1, 3 & 4 and 100 μl in row 2. Dispense 25 μl of each sample into a well in row 1.
- Mix well and transfer 25 μl from row 1 to row 2. Mix well and transfer 25 μl from row 2 to row 3. Mix well and discard 25 μl from row 3. Transfer 25 μl from row 2 to row 4. Mix well and discard 25 μl from row 4. Add 75 μl of well mixed Control Cells to row 3. Add 75 μl of well mixed Test Cells to row 4.
- Tap plate gently to mix. The final dilutions in row 3 and 4 are 1/80. Cover and let stand at room temperature for 45 to 60 minutes (alternatively the plates can be left overnight).
- Examine for agglutination patterns.

Interpretation of TPHA:

Positive: Agglutinated cells form an even layer over the bottom of the well.

Negative: Non-agglutinated cells form a compact button in the center of the well.

Control: Kit controls are prediluted and should be added directly into individual wells in row 3 and 4 (no diluents required).

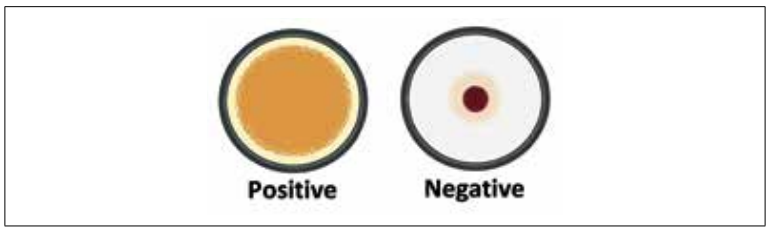


Figure -11: Positive and negative TPHA test in microtitre plate

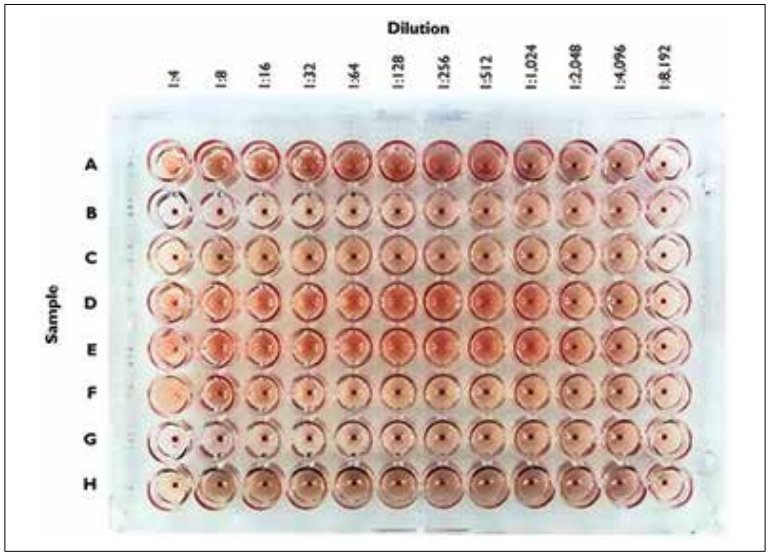


Figure-12: TPHA test using microtitre plate

7.8 *Chlamydia Trachomatis* (Chlamydial Infection)

Antigen detection assays, direct immunofluorescence assays (DFAs), and solid phase enzyme-linked immunosorbent assays (ELISAs) for *Chlamydia Trachomatis* were developed in the early 1980s, making diagnosis of chlamydial infections more available. As additional ELISAs were developed, several rapid, point-of-care (POC) assays became available. DFA, lab-based ELISA, and POC suffered from low sensitivity relative to culture and suboptimal specificity. However, the rapid turn around time and the less restrictive requirements for specimen transportation made them an attractive option, particularly in high-prevalence settings.

The next major advance in chlamydia diagnostics was the utilization of nucleic acid sequences rather than antigens as detection targets. The sensitivity of the initially developed non-amplified nucleic acid hybridization assay (NAH) tests was similar to that of culture, but again there were questions regarding specificity. Nucleic acid amplification tests (NAATs) were the next diagnostic development. NAATs use enzymatic methods to amplify target DNA or RNA exponentially into billions of copies. Due to the superior performance characteristics, e.g. sensitivity, specificity, range of specimen types, automation, and independence from maintaining organism viability, NAATs are strongly recommended for diagnosis and screening of chlamydial infections.

7.9 *M. Genitaliumis* (Genital Mycoplasmosis)

For practical purposes, diagnosis of *M. genitalium* is limited to nucleic acid amplification test (NAAT), as culture is extremely slow (several months), challenging, and insensitive. To date, no serological assays, antigen detection assays, or point-of-care tests have proven useful for diagnosis of urogenital *M. genitalium* infections. If only one specimen is tested from each patient, it appears that first-void urine from men and vaginal swabs from women contain the highest load of bacteria. Most of those polymerase chain reaction (PCR) assays are based on detection of the MgPa adhesin gene of *M. genitalium*. Some parts of the MgPa gene (the MgPa TaqMan real-time assay described by Jensen et al. has been widely used worldwide with good results), are highly variable and primers targeting these regions will not perform well with clinical specimens.

7.10 Herpes Simplex Virus 1 & 2 (Genital Herpes infection)

Genital herpetic infection often is diagnosed on clinical grounds as a result of the presence of a cluster of vesicular lesions. Laboratory methods used for the diagnosis of HSV infection include direct detection of HSV in material from lesions and indirect serological methods. Available tests for HSV include antigen detection, viral culture, and nucleic acid amplification tests (NAAT) for viral DNA, as well as the use of serological assays to screen for exposure to HSV by detecting HSV-type- specific antibodies. Viral culture with further herpes typing has been the cornerstone of HSV diagnosis throughout the past two decades. However, detection of HSV DNA in clinical specimens using amplified molecular testing has now emerged as an alternative method because it is up to four times more sensitive, less dependent on collection and transportation conditions, and more rapid than viral culture.

Cytological examination

Direct examination of specimens and cytological examination using conventional staining procedures (Tzanck smears, Papanicolaou, or Romanovsky stains) have been found to have low sensitivity and specificity and should not be relied upon for diagnosis of herpesvirus infection. However, a diagnosis of herpes cervicitis may be an incidental finding during examination of routine Pap smears submitted for cervical cytology.

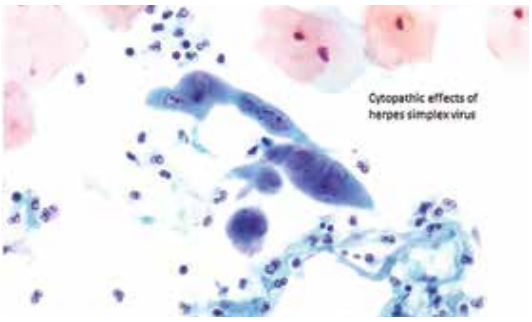


Figure-14: Herpes virus infection of the cervix (a) Margination of chromatin and ground glass appearance of nuclei, multinucleation, cytomegaly and eosinophilic inclusions found in Pap seam microscopy.

Viral antigen detection

When mucocutaneous lesions are present, viral antigen in lesional material can be detected using direct immunofluorescence (IF), immunoperoxidase (IP) staining, or enzyme-linked immunosorbent assay (ELISA). Direct IF could be classified as a rapid diagnostic test, allowing type differentiation of genital herpesviruses using clinic-prepared smears or laboratory-prepared smears from swabs transported to the laboratory. For the latter, cells should be concentrated before smears are prepared. HSV-1 and HSV-2 antigens may be detected by type-specific fluorescein-labelled monoclonal antibodies.

7.11 *H. ducreyi* (Chancroid)

The laboratory diagnosis of chancroid traditionally has been based on recovery of *H. ducreyi* in culture, which is a technically demanding procedure with low yield outside of highly skilled laboratories used to working with the pathogen. Bacteriological culture for *H. ducreyi* remains the main tool for diagnosis of chancroid in the clinical setting and for many years was the "gold standard" for evaluating other diagnostic methods. Successful culture is critically dependent on using freshly made media (ideally fewer than 7 days old) and attention to correct incubation conditions.

Direct examination of clinical material on Gram-stained smears occasionally can be useful for the diagnosis of chancroid if typical small Gram-negative bacilli grouped in chains of "schools of fish", "railway tracks", or "thumb prints" are visualized. However, these classical morphological appearances are rarely seen in clinical practice.

Serological tests for the detection of *H. ducreyi* antibody currently are not commercially available. Although no commercial nucleic acid amplification tests (NAATs) exist for the diagnosis of chancroid, several in-house NAATs have been used to enhance diagnostic sensitivity.

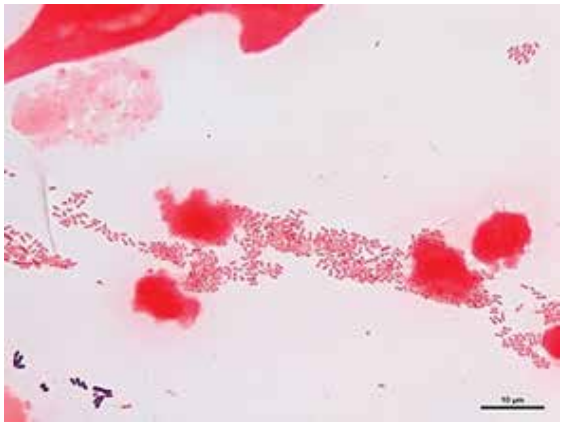


Figure-15: Gram stained smear of wound swab taken from chancroid lesion revealed Gram negative bacilli grouped in chains.

7.12 Lymphogranuloma venereum (LGV)

Since the mid-1990s, **nucleic acid amplification tests (NAATs)** have become the tests of choice for diagnosis of chlamydial infections. These commercially available NAATs are substantially more sensitive than the older diagnostic tests. However, these tests cannot discriminate between non-LGV and LGV strains. Subsequently, molecular assays have been developed that can differentiate between strains based on a deletion that occurs in the pmpH gene only in LGV isolates.

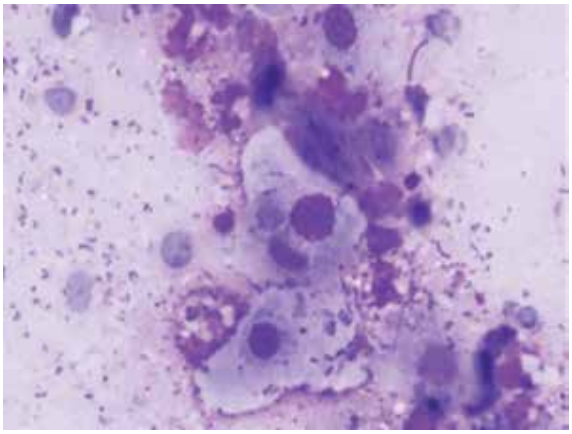


Figure-16: Giemsa-stained smear of ulcer material containing monocytes and Donovan bodies (1000×)

7.13 Donovanosis (Granuloma inguinale)

Laboratory diagnosis depends on the visualization of Donovan bodies in Giemsa stained smears obtained from clinical lesions or in stained histological sections of tissue biopsies. The organism can only be cultured with difficulty in specialist centers using monocyte/Hep-2 cell cultures; it is not yet possible to grow the organism on artificial media. In-house nucleic acid amplification assays have been reported in the literature but such assays are not available in most countries for routine diagnostic purposes.

Morphology:

The Donovan bodies appear as cocco-bacilli within large vacuoles (25–90 μm in diameter) in the cytoplasm of large histiocytes and occasionally in plasma cells and polymorphonuclear leukocytes. The organisms are blue to purple in colour and often are surrounded by a prominent-clear to acidophilic pink capsule. Typical bacteria resemble closed safety pins.

7.14 Human Papilloma Virus (HPV) infection

HPV testing relies on molecular methods. A wide variety of HPV assays are available commercially as well as developed by laboratories. Use in clinical settings requires either that laboratories rely on assays that have been validated by regulatory agencies for specific clinical indications, or that laboratories undertake validation of the clinical performance of the assay. Because cancer precursors are associated only with high risk (HR) HPV, there are no clinical indications for low risk (LR) HPV testing. There is some variation in which HR HPV types are clinically relevant, but most assays include (or cross-react) with the following 14 HR HPV types: 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68.

7.14.1 Morphological Method

Visual examination (VIA, VILI)

Visual inspection of the cervix at physical examination, using either acetic acid (VIA) or Lugol's iodine (VILI) is to visualize the cervical lesions to make them visible to the "naked eye". Visual inspection with acetic acid i.e. VIA can be done with the naked eye (also called cervicoscopy or direct visual inspection [DVI]), or with low magnification (also called gynoscopy, aided VI, or VIAM).

Colposcopy

The colposcope provides a magnified visual impression of the labia, vagina and the cervix (vagina) and TZ. Application of 5% acetic acid solution results in acetowhite staining of the abnormal areas in the epithelium. Colposcopy is a descriptive diagnostic tool suggesting an abnormality, and directed punch biopsies are necessary to confirm the findings using light microscopy.

Pap smear cytology

Cervicovaginal cytology is the time-honoured diagnostic method used in screening for cervical cancer precursor lesions. This diagnostic tool is known as the Papanicolaou (Pap) test or simply Pap smear. Exfoliated cells from the vagina and uterine cervix are collected with a wooden spatula and a small brush (cytobrush), followed by fixation of the smear onto a glass slide. To classify the abnormalities in the Pap smear, different classification systems are in use**.** The 2001 Bethesda system (TBS 2001) is currently the most widely used classification.

Liquid-based cytology (LBC)

Liquid-based cytology (LBC) is a modification of Pap smear cytology, where the sample is collected from the cervix in the same way as with Pap smear cytology. The cervical sample in this method involves making a suspension of the cells, which is then used to produce a thin layer of cells on the cytological slide.

Test	Manufacturer	Method	Types (target)
Hybrid Capture (HC2)	Qiagen (Valencia, CA, USA)	Signal amplification	13 HR (genomic DNA)
Cervista HPV HR	Hologic (Bedford, MA, USA)	Probe amplification (Invader Technology)	14 HR (proprietary DNA)
Cervista HPV	-	-	HPV 16/18
APTIMA HPV	GenProbe (San Diego, CA, USA)	Target amplification (transcrition-mediated amplification)	14 HR (E6/E7 RNA)
Cobas HPV	Roche (Pleasanton, CA, USA)	Target amplification (PCR)	14 HR (L1 DNA)

Table 1: FDA approved HPV tests

1. **HPV DNA detection:**

Nucleic acid hybridization

Following rapid technological development, several types of hybridization methods have become available for HPV testing since the early 1980's. All nucleic acid hybridization methods are based on HPV DNA or RNA detection, in which a probe sequence is bound to a complementary sequence in the sample. The most common methods used in HPV testing include the following: Hybrid Capture, Southern transfer hybridization (STH), dot blot hybridization (DB) and in situ hybridization (ISH). In routine HPV testing, all these have been mostly replaced by PCR-based techniques.

2. **HPV E6/E7 mRNA testing**

There are commercially available HPV RNA tests to detect HPV mRNA transcripts coding for E6/E7 and thereby the presence of oncogene. A nucleic acid sequence-based amplification method detecting E6/E7 transcripts of the five most common HR-HPV types in cervical carcinoma (types 16, 18, 31, 33 and 45) is commercially available.

7.14.2 Visual Inspection with Acetic Acid (VIA)

Pap smear are considered the gold standard of cervical screening. Unfortunately, they require skilled practitioners and good laboratories to be effective. HPV tests are good at identifying women at risk for cancer. However, they do not actually diagnose cancer and come at a non-trivial expense. That is why doctors have developed a test known as visual inspection with acetic acid (VIA). It is cheap, easy, and effective. VIA, sounds like a scary way to test for cervical cancer. In reality, it's quite simple.

HPV tests look for HPV DNA and require skilled technicians. Pap smears look for small cellular changes in the cervix, and require a trained pathologist, VIA allows doctors to directly see lesions and other changes in the cervix that are large enough to, presumably, need treatment.

The VIA procedure is quite straightforward. The healthcare provider simply swabs vinegar, i.e. acetic acid, on the cervix. Then they look for areas that change color. Normal cervical tissue remains unaffected by the acetic acid. In contrast, damaged tissue — such as that found in pre-cancerous or cancerous lesions — turns white. The provider can then remove the damaged tissue on the spot using cryotherapy or other technique. They can also perform a biopsy for further follow-up.

Overall, VIA seems to be an excellent cervical cancer screening method for use in low-resource settings. It works really well in situations where Pap smears and HPV tests are inappropriate due to either lack of expertise or high per-test cost. The general consensus is that VIA is just as useful as the Pap smear. It's just a matter of determining which one is more appropriate in any given circumstance. That depends on the financial situation as well as the availability of trained personnel for screening and follow-up.

VIA can be performed in any clinic that has the following items:

1. Examining table
2. Light source
3. Bivalve speculum (Cusco)
4. Instrument tray or container
5. Leak-proof container or plastic bag

Instrument & supplies should be available as follows:

- Kidney tray
- Bottles with normal saline
- 5% acetic acid
- Cottontipped fine swab
- Vaginal speculum
- Larger cotton-tipped -swab sticks
- Sponge-holding forceps
- Cotton swabs
- Disinfected surgical gloves
- 0.5% chlorine solution for decontamination
- A record form for recording the findings (Client assessment form, screening card & screening register)

Examination gloves should be new. (If surgical gloves are being reused, they should be decontaminated, cleaned, and high-level disinfected after each use. With sterile gloves, this process is not necessary.) It's safe and advised to use a new pair of gloves for every woman.

Acetic acid is the main ingredient of vinegar. A dilute 5% solution is recommended. If vinegar is not available, often what is sold in the market is a "vinegar substitute" that, in fact is acetic acid. If neither vinegar nor an acetic acid substitute is available, a pharmacist/chemist or local chemical supplier can make the dilute acetic acid using the following formula:

Total Parts (TP) water = % Concentrate/% of Dilute - 1 %

For example, to prepare a dilute solution (5%) from a 20% concentrated acetic acid solution:

TP water = 20%/5%-1= 4-1= 3 parts of water to 1 part of concentrate.

Chlorine solution (0.5%) is used to decontaminate the speculum and surgical gloves after each use. After decontamination, the speculum, instrument tray/container, and surgical gloves should be washed with soap and water, thoroughly rinsed, and then high-level disinfected or sterilized.

Step-by-Step Instructions

Client Assessment and Getting Ready

1. Before performing the VIA test, discuss the procedure with the woman. Explain why the test is recommended and exactly what will take place during the examination. Also discuss with her the nature of the most likely findings and the follow-up or treatment that might be required.

2. Make sure that all necessary instruments and supplies are available, including a high-level disinfected or sterile speculum, cotton swabs in a clean container, a bottle of dilute acetic acid and adequate light source. Bring the woman into the examination area. Ask her to empty her bladder if she has not already done so. If her hygiene is poor, have the woman thoroughly wash and rinse her genital area. Ask her to remove only enough clothing (including undergarments) so that the pelvic examination and VIA test may be performed.
3. Assist the woman with positioning herself on the examining table and drape her for the pelvic examination.
4. Wash hands thoroughly with soap and water and dry with a clean, dry cloth or air dry. Palpate the abdomen.
5. Put a pair of new examination or high-level disinfected surgical gloves
6. Arrange the instruments and supplies on a high-level disinfected tray or container, if not already done.
7. Inspect the external genitalia and check the urethral opening for discharge. Palpate the Skene's and Bartholin's glands. Tell the woman that the speculum is about to be inserted and that she may feel some pressure.
8. Gently insert the speculum fully or until resistance is felt and slowly open the blades to reveal the cervix. Adjust the speculum so that the entire cervix can be seen. This may be difficult in cases where the cervix is large or extremely anterior or posterior. It may be necessary to use a clean cotton swab, spatula or other instrument to gently push the cervix down or up into view.

   Note: If the walls of the vagina are very lax, use a cotton swab to push away any tissue protruding between the blades of the speculum. Alternatively, prior to insertion of the speculum, a condom can be rolled over the blades and the tip of the condom cut off. When the speculum is inserted and the blades are opened, the condom will prevent the walls of the vagina from pushing into the space between the blades.
9. When the cervix can be seen in its entirety, fix the blades of the speculum in the open position so that it will remain in place with the cervix in view. Doing this enables the provider to have at least one hand free.

   Note: Throughout the procedure, it may be necessary to repeatedly adjust either the angle from which the cervix is viewed or the light source in order to achieve the best view of the cervix.
10. Look at the cervix and check for evidence of infection (cervicitis) such as whitish purulent discharge (mucopus); ectopy (ectropion); grossly apparent tumors or Nabothian cysts, ulcers or "strawberry" lesions (Trichomonas infection).
11. Use a clean cotton swab to remove any discharge, blood or mucus from the cervix. Dispose of the swab by placing it in a leak-proof container or plastic bag.
12. Identify the cervical os and squamo-columnar junction (SCJ) and the area around it.
13. Soak a clean swab in dilute acetic acid solution and apply it to the cervix. If necessary, use clean swabs to repeat applications of acetic acid until the cervix has been thoroughly washed with acid. Dispose off used swab(s).
14. Once the cervix has been washed with the acetic acid solution, wait for 2 minutes, and observe the cervix for acetowhite changes.
15. Inspect the SCJ carefully. Check to see if the cervix bleeds easily. Look for any raised and thickened white plaques or acetowhite epithelium.
16. As needed, reapply acetic acid or swab the cervix with a clean swab to remove any mucus, blood or debris that develops during the inspection and that may obscure the view. Dispose off used swab(s).

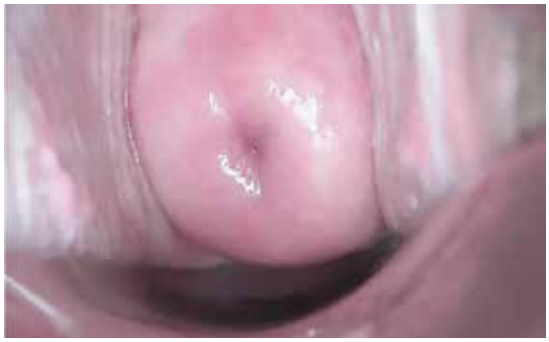


Figure 17: VIA negative

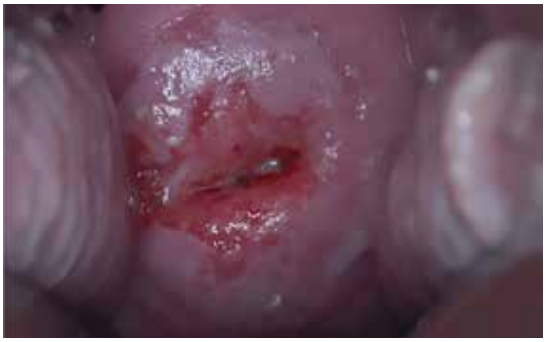


Figure 18: VIA positive

17. When visual inspection of the cervix has been completed, use a fresh cotton swab to remove any remaining acetic acid from the cervix and vagina. Dispose off used swab(s).
18. Gently remove the speculum. If the VIA test is negative, place the speculum in 0.5% chlorine solution for 10 minutes for decontamination. If the VIA test is positive and, after counseling, the patient requests immediate treatment.

Post-VIA Tasks

19. Wipe the light source with 0.5% chlorine solution or alcohol to avoid cross-contamination between patients.
20. Immerse both gloved hands in 0.5% chlorine solution. Remove the gloves by turning them inside out. If disposing of the gloves, place them in a leak-proof container or plastic bag.
21. Wash hands thoroughly with soap and water and dry them with a clean, dry cloth or air dry.
22. Record the VIA test results and other findings such as evidence of infection (cervicitis); ectropion; grossly apparent tumors; or Nabothian cysts, ulcers or "strawberry cervix." If acetowhite change that is characteristic of a diseased cervix is present, record the cervical examination as abnormal. Draw a "map" of the cervix and the diseased area on the record form
23. Discuss the results of the VIA test and pelvic examination with the woman. If the VIA test is negative, tell her when to return for repeat VIA testing after 5 years.
24. If the VIA test is positive or cancer is suspected, tell the woman what the recommended next steps are. If treatment is immediately available, discuss this possibility with her. If referral is required for further testing or treatment, make arrangements for the referral and provide the woman with the necessary forms and instructions before she leaves the clinic. If it is possible to make an appointment now, this is the best time.

7.15 HIV infection

HIV laboratory may need in suspected HIV infected case with history of high-riskbehavior (unsafe sex practice, multiple sex partner, unsafe blood or blood product transfusion or accidental-prick case, rape victim, IUDs and vertical transmission from HIV-positive mother) and Positive-HIV screening test client needs to do VCT (Voluntary counseling and Testing) to confirm HIV infection. It is unethical to do HIV testing without counseling. Details of HIV testing is discussed in national HTC guidline.

7.16 Antimicrobial susceptibility testing (AST)

N. gonorrhoeae has developed resistance to all previous first-line antimicrobials for treatment of gonorrhoea, e.g. penicillins, tetracycline, and fluoroquinolones, leaving the expanded-spectrum cephalosporins ceftriaxone and cefixime as the only antibiotics recommended for treatment of gonococcal infections in many countries. During the past decade, susceptibility to the expanded-spectrum cephalosporins has also decreased in many regions worldwide, and treatment failures with cefixime have been verified in several countries. Recently, the first extensively-drug resistant (XDR; 2) gonococcal strains with high-level resistance also to ceftriaxone (the last remaining option for empirical first-line treatment) were verified. If ceftriaxone-resistant strains spread globally, gonorrhoea will become untreatable with single-antimicrobial regimens in certain circumstances, and especially in some settings. Accordingly, it is crucial to monitor the antimicrobial susceptibility of *N. gonorrhoeae* locally, regionally, and globally. WHO has revisited and revamped the WHO Global Gonococcal Antimicrobial Susceptibility Surveillance Programme (GASP). In June 2012, WHO also launched the WHO global action plan to control the spread and impact of antimicrobial resistance in Neisseria gonorrhoeae.

The agar dilution method is the recommended "gold standard" method for antimicrobial susceptibility testing or determination of the minimum inhibitory concentration (MIC; in μg/ml or mg/l) of gonococcal isolates to antimicrobial drugs. However, this method can be laborious and less suited for routine susceptibility testing, especially if testing a low number of strains. Therefore, the standardized and quality-assured E-test method, which correlates closely with the agar dilution method, is commonly used.

A qualitative determination of antimicrobial susceptibility can be obtained using disc diffusion assay. Several disc diffusion methods are also in use; however, these require pronounced standardization and appropriate QC to attain a high level of reproducibility and correct interpretation to reflect adequately the MIC values of the different antimicrobials. The disc diffusion methods are inexpensive but only recommended for use when MIC determination cannot be performed, due to limited resources or other reasons. If using a disc diffusion method, it is recommended that the finding of any new, emerging, or rare antimicrobial resistance is confirmed by MIC determination. β-lactamase production is often determined by a chromogenic cephalosporin test, using nitrocefin discs or nitrocefin solution.

All methods for antimicrobial susceptibility testing should be performed from pure, fresh (18–24 hours) *N. gonorrhoeae* cultures taken from non-selective culture media. The isolates also should have been appropriately species-verified and subcultured at least once. In antimicrobial susceptibility testing, it is important to follow all steps of the nominated method precisely, including selection and use of agar medium, reagents (antimicrobial powder, E-test strips, discs, and buffers), inoculation, incubation, and interpretation.

Choice of antimicrobials included in antimicrobial susceptibility testing:

The list of antimicrobials to be tested should include drugs nationally or regionally recommended and used for treatment of gonococcal infections as well as drugs recommended by the local antimicrobial susceptibility surveillance programme. However, especially at reference laboratories, additional antimicrobials can be tested, such as antimicrobials recommended for treatment in other settings, antimicrobials that may be candidates for future treatment, and drugs useful for local longitudinal studies of *N. gonorrhoeae*.

7.17 Screening of STIs

Laboratory and point-of-care (POC) tests are potentially powerful contributors to the management and control of STIs through facilitation of prevention of STI transmission and their sequel. The large numbers of STIs as well as the variety of potential tests for each STI make the appropriate choice of diagnostic tests difficult. At the present time, a wide variety of available STI tests have attributes and potential limitations that could affect how they might be used to enhance STI control. Further, in an era of limited resources, decision-making about which and how many STIs to invest in for testing, who to test, and which of the multiple available tests to use for a designated purpose can be difficult. Test selection should reflect a prioritization process that considers infection prevalence, the impact of the infections and their complications on individuals and populations, test performance characteristics, the cost of the tests, and the reasons that testing is being performed.

Table-2: Types of STI Screening Method

Type	Method
Clinical screening	Assessing about the presence of any of the STI syndrome General examination including speculum and bimanual examination to look for signs of STI not noticed by the client.
Laboratory screening	Serological screening for syphilis.
	VIA for early detection of cervical cancer.
	Testing and counseling for HIV.

Screening is an essential element of optimal STI management and control strategies that builds on the contributions of syndromic management and diagnostic testing. All STIs may occur in an asymptomatic form or be unrecognized by infected persons. Despite the absence of identified symptoms, persons with asymptomatic infections may be at risk for transmission to others and for complications of infection. As a result, screening (i.e. testing of at-risk persons without recognized signs or symptoms) will identify infected persons, thus reducing their risks for complications or for transmission of infections. As with testing for diagnosis, the time interval between testing and provision of treatment, as well as the proportion of persons receiving treatment, if some are lost to follow-up, are useful quality measures. Screening for STIs may be more cost-efficient if it can be targeted to at-risk population subgroups; targeting is often best accomplished using surveillance data.

A signicant proportion of women and men with STIs do not have symptoms, or have minimal symptoms and do not realize that anything is wrong. Silent asymptomatic infections can be more serious than symptomatic ones. Identifying and treating such patients prevent the development of complications for the individual patient and help reduce transmission in the community.

Syphilis

Syphilis in both men and women is associated with serious complications. More importantly, syphilis remains a leading cause of perinatal mortality and morbidity in many parts of the world despite widely available and a ordable technology for diagnosing and treating infection in pregnant women. Among pregnant women in the early stages of syphilis who are not treated, an estimated two-thirds of pregnancies end in abortion, stillbirth, or neonatal infection.

Indication and opportunities for screening

- Screening for syphilis during pregnancy should be done at the first antenatal visit, or as early as possible.
- Women who do not attend antenatal clinic should be tested at delivery. Although this will not prevent congenital syphilis, it permits early diagnosis and treatment of newborns.
- Because of the serious complications of syphilis in pregnancy, the first priority should be to ensure universal antenatal screening.
- Women who have had a spontaneous abortion (miscarriage) or stillbirth should also be screened for syphilis; in many areas, identification and treatment of syphilis remove a major cause of adverse pregnancy outcome.
- Men and women with STI syndromes other than genital ulcer should be screened for syphilis. HoweverScreening is unnecessary for patients with ulcers who should be treated syndromically for both syphilis and chancroid without testing.

Recommended screening tool:

- Rapid plasma reagin (RPR) is the preferred tests for syphilis screening. RPR can be performed without a microscope. These tests detect almost all cases of early syphilis but false positives are possible.

Note: *all patients who are reactive to RPR should be treated.*

Recomedations:

- Patients should receive their test results the same day before leaving the clinic.
- Patients with reactive (positive) results should be treated immediately (see treatment of syphilis in pregnancy in section 6.1).
- All patients must be asked for a history of allergy to penicillin. Sex partners of those found with positive results should also be treated without prior testing.

Cervical Infections

Cervical infections are much less common than vaginal infections, especially among women who use reproductive health services, and are usually asymptomatic. The cervix is the most common site of infection for gonorrhoea and chlamydia. Even if a woman is asymptomatic, it may be possible to detect signs of infection on careful speculum examination. Speculum examination may also reveal signs of other infections, including cervical ulcers and genital warts.

Indications and opportunities for screening Screening may be done:

- Any time a speculum examination is performed for other reasons.
- People with frequent exposure to STIs, such as sex workers, should be screened regularly.
- For ART clients in ART clinics.
- For clients seeking FP services.

Table-3: Sensitivity of STI Screening method

Infection/ condition	Screening method	In 100 cases, Number that will be detected	Remarks
Syphilis	Non-treponemal serological screening tests	80–86 (primary infection)	Positive test indicates a high likelihood of syphilis infection, although not necessarily current active disease. Patients who test positive should receive treatment.
		100 (secondary)	
		80 (latent infection)	
		71–73 (late stage)	
Cervical infection (gonorrhoea and or chlamydia)	• Clinical examination (Speculum examination) • Gram stain	30-40	Inexpensive; misses many cases (false negatives).
Cervical dysplasia	VIA	77	Effective for early detection and prevention of cervical Cancer

Available screening tools

- Syndromic screening through history and physical examination
- Careful speculum examination may detect many (but not all) cervical infections.

Recommended approach

- Assess for any symptomatic abnormal vaginal discharge and genital ulcer
- A careful speculum examination should be done to look for signs of cervical infection. some asymptomatic internal ulcers and genital warts may also be detected on speculum examination.

Cervical infection is usually asymptomatic and women without vaginal discharge are as likely to have gonorrhea and/or chlamydial infections. Despite lack of symptoms, consequences can be severe if infection reaches the upper genital tract for the case of gonorrhoea or chlamydia and cervical cancer in case of HPV.

7.18 Cervical Cancer Screeing

Cervical cancer is a recognized complication of STI, related to infection with a few specific strains of human papilloma virus. Screening and treatment of early stages (cervical dysplasia) can reduce cervical cancer mortality by 80 per cent or more among screened women. In resource-poor settings like Bangladesh, 30 to 49-year-old women comprise the target audience for screening because cervical cancer is rare in women under 30. Screening younger women will detect many lesions that are not likely to develop into cancer, will lead to considerable over treatment, and are not cost-effective. In Bangladesh, visual inspection with acetic acid (VIA) screening of cervical cancer is recommended. For HIV negative women, the target age groups for VIA are of women age 30 – 49 years while in case of HIV positive women the age is lowered to 25 years.

Screening Frequency

The FMOH recommends screening every five years following normal results irrespective of HIV status Following abnormal results and/or treatment, repeat screening in one year. If follow-up screening is normal, return to screening every five years.

For more information, please go through the national cervical cancer guideline.

Section-8
HIV infection and Relation with STIs

8.1 General Considerations of HIV and AIDS

HIV stands for human immunodeficiency virus, which is the virus that causes HIV infection. The abbreviation "HIV" can refer to the virus or to HIV infection. AIDS stands for acquired immunodeficiency syndrome. AIDS is the most advanced stage of HIV infection. Human immunodeficiency virus (HIV) attacks and destroys the infection-fighting CD4 cells of the immune system. The loss of CD4 cells makes it difficult for the body to fight infections and certain cancers. Without treatment, HIV can gradually destroy the immune system and advance to AIDS. In developing countries, such as Bangladesh, the period between HIV infection and AIDS is usually shorter than in developed countries because of the generally poorer health conditions in developing countries.

People with AIDS are vulnerable to many infections, called opportunistic infections, which take advantage of the immune system's weakened state to attack the body. The signs and symptoms that these infections commonly cause are together called a syndrome.

8.2 Transmission of HIV

8.2.1 HIV transmission in General

The spread of HIV from person to person is called HIV transmission. HIV is spread through contact with certain body fluids from a person with HIV. These body fluids include blood, semen, pre-seminal fluid, vaginal fluids, rectal fluids and breast milk. The spread of HIV from a woman with HIV to her child during pregnancy, childbirth, or breastfeeding is called mother-to-child transmission of HIV. HIV is spread mainly by having anal or vaginal sex with someone who has HIV without using a condom or taking medicines. By being stuck with an HIV-contaminated needle or other sharp object this is a risk mainly for health care workers. Pre-exposure prophylaxis (PrEP) is an HIV prevention option for people who don't have HIV but who are at high risk of becoming infected with HIV. PrEP involves taking a specific HIV medicine every day. Mother-to-child transmission is the most common way that children get HIV. HIV medicines, given to women with HIV during pregnancy and childbirth and to their babies after birth, reduce the risk of mother-to-child transmission of HIV. Use of dental instruments are important source of HIV transmission.

In extremely rare cases, HIV has been transmitted by

- Oral sex—putting the mouth on the penis (fellatio), vagina (cunnilingus), or anus (rimming). In general, there's little to no risk of getting HIV from oral sex. But transmission of HIV, though extremely rare, is theoretically possible if an HIV-positive man ejaculates in his partner's mouth during oral sex.

- Eating food that has been pre-chewed by a person with HIV. The contamination occurs when infected blood from a caregiver's mouth mixes with food while chewing. The only known cases are among infants.
- Being bitten by a person with HIV. Each of the very small number of documented cases has involved severe trauma with extensive tissue damage and the presence of blood. There is no risk of transmission if the skin is not broken.
- Contact between broken skin, wounds, or mucous membranes and HIV-infected blood or blood-contaminated body fluids.
- Deep, open-mouth kissing if both partners have sores or bleeding gums and blood from the HIV-positive partner gets into the bloodstream of the HIV-negative partner. HIV is not spread through saliva.

Box-1: Ways through which HIV transmission occurs and does not occur.

Ways of HIV transmission from HIV infected person	Behaviors through which HIV does not spread
Usual ways:	• Insect bite • Talking, sneezing, coughing or through air • Shaking hands with or embracing an infected person • Sharing toilet or swimming pool with an infected person • Playing or eating together • Using towels or clothes • Living in a same family or taking care of a person with HIV • Going to the same school as that of an infected person • Masturbation • Correct and consistent use of condoms
• Body fluids (Blood, semen, pre-seminal fluid, vaginal fluids, rectal fluids and breast milk) • Mother-to-child transmission • Anal or vaginal sex with someone who has HIV • Eating food that has been pre-chewed by a person with HIV	
Extremely rare ways:	
• Oral sex • Being bitten by a person with HIV • Contact between broken skin, wounds, or mucous membranes. • Deep, open-mouth kissing if both partners have sores or bleeding gums.	

8.2.2 Risk of transmission among health care workers

The risk of health care workers being exposed to HIV on the job (occupational exposure) is very low, especially if they use protective practices and personal protective equipment to prevent HIV and other blood-borne infections. For health care workers on the job, the main risk of HIV transmission is from being stuck with an HIV-contaminated needle or other sharp object. However, even this risk is small. Scientists estimate that the risk of HIV infection from being stuck with a needle used on a person with HIV is less than 1%.

8.2.3 HIV Transmission by Body Piercing or Tattooing

It is possible to get HIV from a reused or not properly sterilized tattoo or piercing needle or other equipment, or from contaminated ink. It's possible to get HIV from tattooing or body piercing if the equipment used for these procedures has someone else's blood in it or if the ink is shared. The risk of getting HIV this way is very low, but the risk increases when the person doing the procedure is unlicensed, because of the potential for unsanitary practices such as sharing needles or ink. If anyone get a tattoo or a body piercing, be sure that the person doing the procedure is properly licensed and that they use only new or sterilized needles, ink, and other supplies.

8.3 HIV and STIs

8.3.1 Relationship with STI & HIV/Connection between HIV and Other STDs

Having another sexually transmitted infection (STI) can increase the risk of getting or transmitting HIV.If there is another STI, it is more likely to get or transmit HIV to others. Some of the most common STDs include gonorrhea, chlamydia, syphilis, trichomoniasis, human papillomavirus (HPV), genital herpes, and hepatitis. The only way to know for sure if anyone has an STI is to get tested. If you'resexually active, you and your partners should get tested for STIs including HIV if you're HIV-negative regularly, even if you don't have symptoms. If anyone is HIV-negative but have an STI, it is about 3 times as likely to get HIV if he/she has unprotected sex with someone who has HIV. There are two ways that having an STI can increase the likelihood of getting HIV. If the STD causes irritation of the skin (for example, from syphilis, herpes, or human papillomavirus), breaks or sores may make it easier for HIV to enter the body during sexual contact. Even STIs that cause no breaks or open sores (for example, chlamydia, gonorrhea and trichomoniasis) can increase your risk by causing inflammation that increases the number of cells that can serve as targets for HIV. If anyone has HIV-positive and also has another STI, he/she is about 3 times as likely as other people with HIV to transmit HIV through sexual contact. This appears to happen because there is an increased concentration of HIV in the semen and genital fluids of HIV-positive people who also have another STD.

8.3.2 STIs enhance the sexual transmission of HIV through

a. STIs that primarily cause ulcers disrupt the integrity of the skin barrier enabling HIV easy access through such defects in the skin. The presence of genital ulcers is known to increase the risk of HIV transmission by five folds.

b. STIs that primarily cause inflammation such as gonorrhea, trichomoniasis, and chlamydial infections present a weak barrier to HIV.

c. In both the above scenarios, infected lymphocytes among HIV infected individuals are attracted to the lesions and hence increase likelihood of infection to the partner

d. STIs Increase viral shedding (reported in genital fluids of patients with STIs) and increase susceptibility to HIV (STI treatment has been demonstrated to significantly reduce viral shedding).

8.3.3 HIV infection affects STIs through

a. HIV alters susceptibility of STI pathogens to antibiotics

b. Increased susceptibility to STIs among immune suppressed individuals

c. The clinical features of various types of STIs are influenced when there is co-infection with HIV. This can be demonstrated well in the following examples: Syphilis has atypical presentation with a tendency to rapidly progress to neurosyphilis. The patient could present with atypical facial plaques, which is different from the typical rash of secondary syphilis. Both the specific and the non-specific treponemal serologic tests for syphilis may be non-reactive in the presence of infection with *T. Pallidum* when there is co-infection HIV.

   Atypical lesions of chancroid are common and tend to be less purulent often with indurations mimicking primary syphilis. The lesions could as well be extensive and multiple which could be associated with fever and chills

   Recurrent or persistent genital ulcers caused by Herpes simplex virus are common in patients with HIV and they are often multiple and extensive. Extra-genital or perianal ulceration could as well occur.

   Human papilloma virus produces epiphytic genital warts that may be large and extensive, with an increased tendency to produce epithelial dysplasia and cervical cancer.

d. The treatment of conventional STIs is also affected when infection with HIV coexist. Risk of treatment failure following single injection of benzathine penicillin is increased among patient with primary syphilis. Topical anti-fungals are less effective and hence oral antifungals like ketoconazole may be indicated for patients with candidiasis.

   Severe genital herpes may require treatment of primary episode or suppression of recurrence with acyclovir. However, resistance to acyclovir may subsequently develop.

Note

- Conventional STI and HIV infection share similar risk factors.
- Conventional STI facilitate the acquisition and transmission of HIV infection
- Effective management of STI can reduce HIV infection.

8.3.4 How to Minimize Exposure to STIs/HIV

Eliminating the risk of exposure through:

- Abstinence
- Non-penetrative sexual intercourse (vaginal anal sex)
- Avoiding oral sex or anal sex
- Sex with one mutually faithful partner
- Sex with uninfected partner
- Abstaining from high-risk sexual partners
- Avoiding or reducing contact with multiple sexual partners
- Consistent and correct use the male latex condom or female condom

8.4 Opportunistic infections Associated with AIDS

Opportunistic infections (OIs) are infections that occur more frequently and are more severe in people with HIV infection.

Following is a list of the most common OIs for people living with HIV (Box 2).

Box 2: Opportunistic infections associated with AIDS

- Candidiasis of bronchi, trachea, esophagus, or lungs
- Invasive cervical cancer
- Coccidioidomycosis
- Cryptococcosis
- Cryptosporidiosis, chronic intestinal (greater than one month's duration)
- Cytomegalovirus diseases (particularly retinitis) (CMV)
- Encephalopathy, HIV-related
- Herpes simplex (HSV): chronic ulcer(s) (greater than one month's duration); or bronchitis, pneumonitis, or esophagitis
- Histoplasmosis
- Kaposi's sarcoma (KS)
- Isosporiasis, chronic intestinal (greater than one month's duration)
- Lymphoma, multiple forms
- *Mycobacterium avium* complex (MAC) or *Mycobacterium kansasii*, disseminated or extrapulmonary. Other *Mycobacterium*, disseminated or extrapulmonary.
- *Pneumocystis carinii* pneumonia (PCP)
- Pneumonia, recurrent
- Progressive multifocal leukoencephalopathy
- *Salmonella* septicemia, recurrent
- Toxoplasmosis of brain
- Tuberculosis (TB)
- Wasting syndrome due to HIV

8.5 Vulnerability and Risk of STI & HIV/AIDS

Vulnerability: Vulnerability refers to those features of a social or economic entity that makes it more or less likely that the excess morbidity and mortality associated with disease will have adverse impacts upon that entity. Thus, families, communities, and 'Cities will be more or less vulnerable to the impact of increased morbidity and mortality.

HIV & STI vulnerability refers to social or economic factors that affect the acquisition and transmission of these infections and the morbidity and mortality associated with HIV & STI to individuals.

HIV vulnerability reduction strategies are measures designed to address the underlying factors associated with acquisition and transmission of HIV.

Risk: Risk refers to the probability that a person will acquire an infection. Risk reduction strategies refer to measures designed to address the immediate risk-taking action and environmental factors affecting it. HIV risk reduction strategies refer to measures designed to address the immediate risk-taking action and environmental factors affecting it.

Risk versus vulnerability: Risk is different than vulnerability because it refers to the probability that a person will acquire an HIV infection.

Gender and vulnerability to HIV infections: Due to differences in social, political and economic and resources, the vulnerability of men and women are different in Bangladesh.

Women's vulnerability is increased by:

- Social values, which determines the role of women in a society and decide when, where, how and with whom they have sex
- Women's limited economic opportunities and freedom, which can lead women into selling sex for survival
- Cultural acceptance of men's rape of women

Men vulnerability to HIV infection increased by

- The peer and social pressure on young men to have sex to prove their manhood' before they have the skills and knowledge to protect their sexual health (for example. by using condoms)
- Social values that define men's sexuality as a power. This often prevents men from talking about their fears and discussing how to have safer sex with their partners
- The economic opportunities open to many men that lead to more risks from unsafe sex, such as migrating for being in the uniformed forces, or working in all-male occupations.

Factors influencing vulnerability

HIV AIDS is a gender and, broadly a power structure issue. Men, women, and transgenders are vulnerable in different ways. The vulnerability is influenced by the interaction of a wide range of factors (Box-3).

BOX-3: Factors influencing vulnerability to HIV/AIDS	
Factors related to individual	**Factors related to social and economic contexts**
• Sexual history and practice • Levels of unsafe sexual practice • Levels of ledge about sexual health • Ability to protect oneself and others • Knowledge about treatment and support programs • Skills, access and use of condoms • Levels of ledge about safer drug use • Attitudes towards people living with HIV-AIDS • Histories of personal trauma • Possession of personal skills related to STI/ HIV prevention	• Social values and norms about relations between women and men • Social attitudes towards sexuality • Social power structure, women's position in the society • Beliefs and practice • Occupations • Migration • Economic conditions and opportunities • level of respect for human rights; • Extent of racism, sexism or homophobia • Health seeking behavior
Factors related to health care services	**Factors related to the roles of state**
• Availability and accessibility of health services related to STI/TIIV prevention and sexual health • Availability and accessibility of services • Prevention program • Care and support activity	• Political commitment • and ethics • Policies • Human rights • War and conflict

Vulnerability of women to STI/HIV infection

Women are more vulnerable to HIV & STI globally. When first recognized in the early 1980s, HIV/AIDs was a problem of men especially gays; women were at the periphery of the epidemic. By 1985, the heterosexual transmission began to attract global attention. By 1993, another picture emerged: the problem of HIV AIDS among women, an insidious aspect of the AIDS epidemic. Currently WHO estimates worldwide almost half of infected adults are women. Women's susceptibility to STI/HIV seems to be rooted in traditional gender roles. Inequalities that appear common to nearly all societies exert greater external control sexuality than men's. Vulnerability of women can be broadly classified into the following categories:

Biological

- Larger mucosal surface and micro lesions that can occur during intercourse may be entry points for HIV, making very young women even more vulnerable in this respect
- There are usually more virus in semen than in vaginal secretions
- As STIs, women are at least four times more vulnerable to infection; the presence of untreated STIs is a risk factor for HIV

Social and Economic

- Financial or material dependence on men that cannot control when, with whom, or in what circumstances they have sex.
- Many women lune to exchange sex for material favours, for daily survival. There is formal sex work but, in contrast, there is also this sexual exchange, in many poor settings, becomes a woman s only way of providing for themselves and their children.
- Women are not expected to discuss or decide about sexuality.
- Women cannot request, let alone insist, on using a condom or another form of protection
- If women refuse sex or request condom use, they often risk abuse, due to a suspicion of infidelity.
- The many forms of against women mean that sex is often coerced, which is itself a risk factor for HIV infection.
- For married and unmarried men, multiple partners (including sex workers) are culturally accepted.
- Women are expected to have relations with or marry older men, who are more experienced. and more likely to be infected
- Men are seeking younger and younger partners in order to avoid infection and in the belief that sex with a virgin cures AIDS and other diseases.

Men's mobility increases women's vulnerability to STI/HIV

1) Current evidence suggests the environment in well-travelled border crossing areas and international fishing ports fosters more risk-taking behavior than other towns. Moreover, females who live at cross-border locations are at a significantly higher risk of HIV they are more likely to have partners who are mobile males, who, in turn, are at high risk of carrying STI/HIV
2) New highways, growing trade and tourism, economic policies increasingly facilitate travel between countries in the region. In addition, relaxation of requirements for travel documents make countries more open than previously. In many border, communities men outnumber women. This gender disparity, and the fact that many men migrate alone, creates an unusually high demand for commercial sex.

3) Women's vulnerability is also influenced by male labor migration. When mobile men return to their rural households, they re-establish sexual relationships and increase the possibility that HIV/AIDS will be transmitted to rural women.

4) This problem has been demonstrated recently in Thailand, Indonesia and Malaysia. Many young men, who migrated from the cities to the cities during the economic boom, who were forced to return home during the economic crisis of the late 1990s by unemployment. With higher HIV and STI rates in the cities, this reverse-migration may bring STI/HIV' into previously untouched areas and homes.

8.6 Effective interventions

There are a number of interventions, particularly important for women, which together constitute key strategies to the spread of the epidemic.

Prevention of STI/HIV

- Creating awareness of STI/HIV among general populations, particularly targeting the sexually active (e.g. youths)
- Behaviour change among the high-risk population

Treatment of Sexually Transmissible Infections

- Women are more vulnerable to STIs; the consequences are more serious
- Many STIs are asymptomatic in women. Therefore, go untreated
- Syndromic management of STI in women is more difficult than in men
- Stigma associated with STIs is greater for women. Therefore, they are often afraid or unwilling to seek care

Safe blood transfusion

Women and children are the chief recipients of transfusions: for women during and after delivery. The following actions can be taken as alterative to blood transfusions:

- Antenatal care and adequate nutrition to reduce some of the need for transfusion
- Appropriate clinical use of blood to avoid unnecessary transfusion
- All the blood should be screened before use
- Avoidance of professional blood donors and encouragement of voluntary blood donors

Promotion of condoms

- Condoms, male and female, are currently the only protection methods available. They need to be more widely accepted. available and used
- Affordable access to condoms should be increased through free distribution, subsidies. or social marketing
- Condom use (male and female) is low: the acceptability of these methods remains problematic. The female condom is more cumbersome than the male condom and is considerably more expensive. Furthermore. women often cannot control use of condoms
- Condom use should be promoted as a dual protection method for reducing or avoiding pregnancy and STI

Making Men More Responsible

Little attention has been paid to men's participation in efforts to protect women. Men are often hard to reach and educate but some are concerned about their sexual health and that of their partners. Therefore -

- Raising awareness of their risk has been shown to change certain behaviors
- Interventions must be aimed at men (as well as at women) if women are to be protected

Measures to protect women's interests

- Taking into consideration differences in power between women and men
- Changing power dynamics between women and men
- Involving men in reproductive health (RH) services
- Giving women a voice in designing or using RH services
- Understanding cultural influences at work in sexual and RH behavior.

8.7 Diagnosis of HIV infection

Usually diagnosis of HIV infection is based on the detection of HIV antibodies in the blood or plasma/serum, ural fluid of infected persons. Serum or plasma specimens can be used with rapid tests as well as with conventional HIV tests (ELISA and confirmation tests), but that requires venous blood be drawn by means of syringes and collection tubes. In addition, whole blood must be centrifuged to separate the serum/plasma from the red blood cells. Most of the assays available on the market can use whole blood collected by finger stick. This specimen is easy to obtain, requires no equipment, and can be performed by appropriately trained personnel. However, depending on the algorithm used by the country, more than one finger stick may be necessary to complete the testing required by the algorithm. Tests using saliva or oral fluids also currently available and is a non-invasive and convenient method for screening.

8.7.1 Different HIV Antibody Assays

A variety of HIV antibody assays are available. Most current HIV antibody tests are capable of detecting antibodies to both HIV-1 and HIV-2. These assays can be broadly classified into three groups: Rapid Test, Enzyme Linked Immunosorbent Assay (ELISA) and Western Blot Assay (WB)/ Line Immuno Assay (LIA). A variety of rapid tests are available including particle agglutination; Immuno chromatography (lateral flow); Immuno concentration (flow-through device) and comb or dipstick-based assay systems. Rapid tests are most appropriate for the smaller health institutions where only a few samples are processed each day. Rapid tests are quicker and do not require specialized equipment. Most rapid tests have sensitivities and specificities of over 99% and 98% respectively. In ELISA, HIV antibodies in the test serum are detected using an antibody sandwich capture technique. In Western Blot (WB)/Line Immunoassay (LIA), HIV antibodies in the test sample are detected by reacting to a variety of HIV viral proteins.

During the early stage of HIV pandemic, HIV diagnosis was dependent on testing procedures using ELISA to screen a specimen, and if it is reactive, the result was confirmed by testing the specimen with a Western Blot which is treated as Gold Standard test for diagnosis of HIV. However, studies have shown that the latest generation of ELISAs and rapid tests are as reliable for confirmation as Western Blot. In addition, compared with Western blots, ELISAs and rapid tests are less expensive, do not require as high a level of technical expertise to perform and interpret, and produce fewer indeterminate results.

Therefore, UNAIDS and WHO recommend alternative testing strategies using combinations of EIAs or rapid tests to confirm initial positive tests (UNAIDS 1997). The first test (screening test) should be highly sensitive to provide reliable detection of antibodies in a specimen. The second and/or third test (confirmatory test) should be highly specific to confirm that the specimen truly does contain antibodies specific to HIV. WHO/UNAIDS recommends three tests (ELISA or rapid) for use in diagnostic testing in populations with an HIV prevalence ≤10% among asymptomatic persons.[95]

8.7.2 HIV Testing Strategy of Bangladesh:

In alignment with WHO/UNAIDS recommendations, government of Bangladesh has also provided the following guidance on HIV testing strategies. Any of the three[96] testing strategies can be followed for HIV diagnosis.

Strategy 1: Three ELISA run on different kits are adequate to confirm HIV status of the individuals. If the results of two ELISA kits differ, Western Blot or LIA as supplementary test is indicated.

Strategy 2: Three rapid tests run on different kits are also sufficient to confirm HIV status.

Strategy 3: Positive result on ELISA or rapid test followed by Western Blot or LIA should be considered confirmatory.

In the beginning, HIV diagnosis was possible centrally only in capital city following strategy 3 with ELISA and Western Blot. In the year 2006, there was major shifting in testing approach. Due to felt need for rapid scaling up of HIV testing and counselling (HTC) services for Key Affected Population (KAP), an algorithm using three rapid test kits was validated following WHO guideline. The result of the validation study was immediately feed into interventions implemented for KAP. Currently, three rapid tests are used in number of HTC centers for HIV diagnosis. At present, strategy 3 is used for Quality Assessment of HIV rapid test by reference laboratory.

8.7.3 HIV Rapid Tests

Most rapid tests contain antigens to both HIV-1 and HIV-2 and therefore can detect antibodies to both HIV types. However, most tests do not distinguish between HIV-1 and HIV-2 but these are useful for diagnostic purposes. Rapid tests are useful for small laboratories that routinely perform fewer HIV tests per day, for laboratories without electricity or equipment, and for geographic areas with limited laboratory infrastructure.

Rapid tests are crucial options for KAP (e.g., injection drug users, female sex workers) or geographically remote populations. In these populations, opportunities for provision of results may be limited after the initial encounter; therefore, testing (screening and confirmatory) may need to be performed on site on the same day as specimen collection.

The major advantage of the rapid HIV test is that it allows results to be given on the same day as testing thus reducing the number of visits made by the clients. A further benefit is that individuals are more likely to receive their results from the same health care worker who performed pre-test counselling.

95 WHO, UNAIDS, CDC, USAID. Guidelines for Using HIV Testing Technologies in Surveillance: Selection, Evaluation and Implementation. Page 17. 2001.

96 NASP. National Policy on HIV/AIDS and STD Related Issues. DGHS.MoHFW. 1996.

HIV rapid tests have the following advantages:

- Increases access to prevention interventions
- Supports increased number of testing sites
- Same-day diagnosis and counselling
- Robust and easy to use
- Test time under 30 minutes
- Most require no refrigeration
- None or one reagent (a substance used in a chemical reaction to detect or produce other substances)
- Minimal or no equipment required
- Minimum technical skill

However, HIV rapid tests also have a few disadvantages:

- Small numbers for each test run
- Quality Assurance/Quality Control at multiple sites
- Test performance varies by product
- Refrigeration required by some products, e.g., Capillus
- Reader variability in interpretation of results

8.8 HIV Testing Algorithm

8.8.1 HIV testing algorithm and presenty followed algorithm in Bangladesh

There are two commonly used algorithms for rapid testing—serial / sequential and parallel testing. The testing algorithm is currently being in use in Bangladesh is serial testing.[97] Recommended serial testing algorithm is portrayed below:

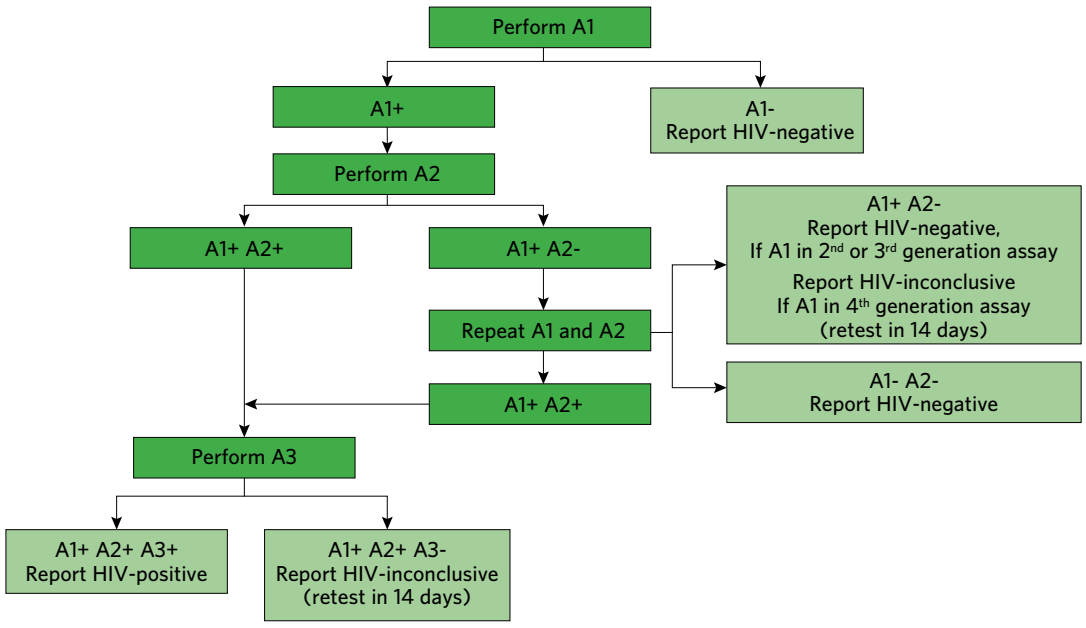


Figure-1: Country valideted HIV testing algorithm.

97 NASP.HIV Counselling Manual. 2009.

Three different rapid test kits are used. These are- Determine HIV-1/2, Uni-Gold ™ Recombigen® HIV and First Response HIV -1-2-0 as denoted as A1, A2 and A3 respectively.

Recommended serial testing algorithm is portrayed below:

1. If this first test (A1) result is non-reactive, there is no need to perform a second test; the result is given to the client as HIV-negative.
2. If the first test (A1) result is reactive or positive, the sample to be tested again using a different brand of rapid HIV test (A2).
3. If the second (A2) test is reactive then another rapid test (A3) should be performed. If the result is reactive then HIV-positive result will be given to the client.
4. a. If the second test is negative (A2-), first and second tests (A1, A2) should be repeated. If on repeating both the tests turned positive (A1+A2+) then another test (A3) will be performed. On the other hand if both the test turned negative then report as "Negative". b. if the result remain same (A+, A2-) in the repeat testing, report HIV negative if A1 is a 2nd or 3rd generation assay; if A1 is a 4th generation assay, report the report the test result as HIV inconclusive (Indeterminate) and retest the client after 14 days
5. After doing A3, there could be total two different outcomes. If result is A1+ A2+ A3+, then report the result as positive. If the result is A1+ A2+ A3-, then consider the results as HIV inconclusive (Indeterminate) and retest the client after 14 days.

8.8.2 Understanding of HIV test results by counselors

Counselors should have a good understanding of the meaning HIV antibody results in order to advise patients accurately on the interpretation of their test results.

A negative result indicates that no antibodies to HIV have been detected in the blood. This result can have one of several meanings:

- The person is not infected with HIV.
- The person may be infected; antibodies to the virus are yet to high up to be detected. In this case, the person is said to be within the window period and advised to test after 3 months.

A positive result indicates that antibodies to HIV have been detected in the person's characteristics blood. This result means the person has been infected; it does not mean necessarily that the patient has AIDS.

Indeterminate result: If the result is indeterminate, review the risk factors & test quality (including verifying reagents). If risk factors/ behaviors are present, request the client to repeat the test after 3 months.

False positive results: Currently available HIV antibody tests are extremely sensitive and false positive rates are appreciable, particularly in low prevalence populations.

A false positive on one assay is unlikely to also test positive on the second assay. A false positive on an ELISA or rapid test in persons may occur due to several reasons.

False negative results: A false negative result reports that the sample is not HIV infected when in fact it is infected. The most common reason for a false negative HIV antibody result is that the patient is recently infected with HIV and is currently within the window period. Therefore, accurate HIV risk assessment during the period is essential. Conducting detailed risk assessment is an important aid to diagnosis as it may identify significant exposure risks that occur within the window period.

Note:

- Confirmatory HIV tests i.e. LIA or WB are used to rule out false-positive results. In these tests, immune response i.e. production of antibody against different HIV proteins are observed in a strip.

Window period of HIV infection

The window period represents the period of time between initial infection with HIV and the time when HIV antibodies can be detected in the blood stream by currently available diagnostic tests. During this period, HIV replicates in the target cells, the subject is highly infectious and may be symptomatic but the patient's blood sample will test negative for HIV antibody. The window period can last up to 12 weeks and may vary between different assays using different methodologies or due to different type of HIV.

Referral for Voluntary Counselling and Testing (VCT) in Bangladesh

Government & non-governmental organizations (NGOs) are providing VCT services through out the country. The Government of Bangladesh has established HIV testing laboratories.

VCT (Voluntary counseling and Testing) three steps or components:

1. **Pre-test counseling:** Discuss purpose of test, carry out risk assessment, explain and obtain informed consent
2. Laboratory confirmation:
   - Serology using commercial ELISA screening test
   - Using the appropriate national testing algorithm

   A. Test result negative:
   - Second test 3 months after last exposure

   B. Test result positive:
   - Result confirmed using two different immunoassays and/or Western blot/Line immune assay (LIA)
   - Second sample checked

3. **Post-test counseling:**

   A. Test result negative
   - Discuss transmission and need for behavior modification, e.g. safer sex, needle exchange
   - Advise second test 3 months after last exposure

   B. Test result positive
   - Explain significance and implications of result
   - Organize urgent medical follow-up
   - Assess coping strategy, e.g. fear of disclosure, discrimination/social rejection
   - Provide verbal and written information
   - Discuss confidentiality issues
   - Organize emotional and practical support (provide names/phone numbers)

Laboratory Criteria (aged ≥18 months)

- Positive result from a screening test for HIV antibody (e.g., reactive ELISA), confirmed by a positive result from a supplemental test for HIV antibody (e.g., using the appropriate national testing algorithm).

  OR

- Positive result or a detectable quantity by any of the following HIV virologic (non-antibody) test:
  - HIV nucleic acid (DNA or RNA) detection (e.g., PCR)
  - HIV p24 antigen test including neutralization assay
  - HIV isolation (viral culture)

Laboratory Criterion for Definitive HIV Infection aged <18 months

A child aged <18 months is categorized as definitively HIV infected if born to an HIV-infected mother and the following criterion is met:

- Positive results on two separate specimens (not including cord blood) from one or more of the following virologic (non-antibody) tests:
  - HIV nucleic acid (DNA or RNA) detection
  - HIV p24 antigen test including neutralization assay, for a child aged ≥ 1 month
  - HIV isolation (viral culture)

Other investigations:

- All patients should have access to CD4 cell-count testing to optimize pre-ART care and ART management.
- HIV-RNA (viral-load) and/or p24 testing is recommended to confirm suspected treatment failure.
- Test for diagnosis of opportunistic infections (OIs)
- To assess general medical condition (e.g., CBC, CRP, LFT, CxR, Electrolytes, Pregnancy test etc.

For more information, please go through the national HIV related guidelines.

Section-9
STI Management in Special Situation

9.1 Sexually Transmitted Infections (STI) and Pregnancy

The interactions between STI and pregnancy include the effect of pregnancy on STI and of STI on pregnancy. The latter is more important because STI may affect the outcome of pregnancy. Several recent surveys indicate that the prevalence of STI is high among pregnant women in developing countries.

Table-1. Effects of STI on pregnancy and pregnancy outcome and associated pathogens

Time	Effects	Pathogens
Effect before pregnancy	Infertility Cervical cancer	*C. trachomatis* and *N. gonorrhoeae* Human papilloma virus (HPV)
Effectduring pregnancy:	Intrauterine growth retardation	Bacterial vaginosis
	Premature rupture of membrane	Bacterial vaginosis
	Preterm birth	Bacterial vaginosis, T. vaginalis
	chorioamnionitis	Bacterial vaginosis
	Still birth	T. pallidum
	Ectopic pregnancy	C. trachomatis & N. gorrorrhoeae
	Foetal wastage	T. pallidum
	Post hysterectomy cuff infection	T. vaginalis
Effect on fetus:	Congenital syphilis	T. pallidum
	Neonatal conjunctivitis	C. trachomatis & N. gorrorrhoeae
	HIV infection	HIV

9.1.1 Mode of transmission of infection in infants

STI in genital tract may infect the infant:

- In utero by way of ascending infection across the amnion or haematogenously across the placenta;
- Intrapartum during delivery; or
- Postpartum by direct contact or breast milk.

9.1.2 Chlamydial infection in pregnancy

In pregnancy, cervical ectropion is common, and it increases the susceptibility of pregnant mother to C. trachomatis infection. C.trachomatis is one cause of neonatal conjunctivitis and occurs by direct contact with infected cervical secretions during delivery.

Treatment[98]:

Azithromycin 1 g orally in a single dose, or Erythromycin base 500 mg orally 4 times a day for 7 days, or Amoxicillin 500 mg orally three times a day for 7 days.

9.1.3 Gonococcal Infection in Pregnancy

Pregnancy is not a special risk factor for gonococcal infection. Disseminated gonococcal infection, salphingitis can occur in early pregnancy. Chorioamnionitis, spontaneous abortion, pre-term rupture of membranes and low birth weight have been attributed to gonococcal infection. N. gonorrhoea is the most serious cause of neonatal conjunctivitis. The infection occurs by the direct contact with infected cervical secretions during delivery, the transmission rate being 30%.

Treatment[99]:

Ceftriaxone: 250mg by intramuscular injection - as a single dose Plus Azithromycin 1gm orally;

or Cefixime: 400mg orally as a single dose (if inj. Ceftriaxone is not available) Plus Azithromycin 1gm orally

9.1.4 Syphilis in Pregnancy

Although pregnancy does not seem to have any effect on symptoms and signs of syphilis, syphilis remains an important cause of fetal and infant loss. Although syphilis is not infectious sexually after the first 2 years of infection, an infected mother can transmit the infection to the fetus for 5 years, possibly longer. The treponemes present in the maternal circulation reach the fetal circulation via the placenta. The organisms may cross the placenta throughout the pregnancy, but the pathologic changes in the fetus do not take place until after 4 months of gestation. A miscarriage during the first 4 months, therefore, is not due to syphilis.

The outcome of pregnancy in untreated syphilis depends on the stage of infection in the mother. The risk of congenital syphilis is greater and the effects more likely to be more severein the early stages of active syphilitic infection, with a much larger number of circulating treponemes available to cross the placenta than in the latter years.

Possible outcomes of syphilis in pregnancy:

- Mid-trimester abortion
- Premature or term stillbirth
- Delivery of syphilitic infant

98 WHO 2016 & CDC STI Guideline 2015

99 WHO 2016 & CDC STI Guideline 2015

- Delivery of an apparently healthy infant who develops symptoms and signs of congenital syphilis within weeks or months, later in childhood or in later life; or delivery of a healthy child remaining normal throughout life with or without positive serological tests

Treatment [100]:

Primary and secondary syphilis: Benzathine penicillin 2.4 million unit in a single dose.

Early latent syphilis: Benzathine penicillin 2.4 million unit in a single dose.

Late latent syphilis: Benzathine penicillin 2.4 million unit each week for three consecutive weeks.

9.1.5 Trichomoniasis in Pregnancy

T. Vaginalis infection has been shown to be associated with adverse pregnancy outcomes, particularly premature rupture of membranes, preterm delivery and low birth weight. This association is particularly important in symptomatic women.

Treatment:

Women can be treated with 2 g Metronidazole in a single dose at any stage of pregnancy. Although Metronidazole crosses the placenta, no evidence of teratogenicity or mutagenic effects in infants has been found in multiple cross-sectional and cohort studies of pregnant women. Data suggest that Metronidazole therapy poses low risk in pregnancy. Although several reported case series found no evidence of adverse effects in infants exposed to Metronidazole in breast milk, some clinicians advise deferring breastfeeding for 12–24 hours following maternal treatment with a single 2gm dose of Metronidazole.

9.1.6 Bacterial Vaginosis in Pregnancy

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

Treatment:

Metronidazole is not usually prescribed in first trimester of pregnancy, but it may be used during early second and third trimester. Metronidazole 500 mg orally, two times daily for 7 days is recommended. Alternatively, Metronidazole gel 0.75%, one full applicator (5 g) intravaginally, once aday for 5 days can be prescribed.

Note: Although Metronidazole crosses the placenta, no evidence of teratogenicity or mutagenic effects in infants has been found in multiple cross-sectional and cohort studies of pregnant women. Data suggest that Metronidazole therapy poses low risk in pregnancy.

100 WHO 2016 & CDC STI Guideline 2015

9.1.7 Vulvo-Vaginal Candidiasis in Pregnancy

VVC occurs frequently during pregnancy. Although there are now some effective single dose treatments, they are not known to be safe or effective. Therefore, only topical azoles (topical ointment and vagina tablets) therapies, applied for 7 days, are recommended for use among pregnant women.

9.1.8 Genital Herpes in Pregnancy

Most mothers of newborns who acquire neonatal herpes lack histories of clinically evident genital herpes. The risk for transmission to the neonate from an infected mother is high (30%–50%) among women who acquire genital herpes near the time of delivery and low (<1%) among women with prenatal histories of recurrent herpes or who acquire genital HSV during the first half of pregnancy. Prevention of neonatal herpes depends both on preventing acquisition of genital HSV infection during late pregnancy and avoiding exposure of the neonate to herpetic lesions and viral shedding during delivery. Because the risk for herpes is highest in newborn infants of women who acquire genital HSV during late pregnancy, these women should be managed in consultation with maternal-fetal medicine and infectious disease specialists.

Routine HSV-2 serologic screening of pregnant women is not recommended. All pregnant women should be asked whether they have a history of genital herpes. At the onset of labor, all women should be questioned carefully about symptoms of genital herpes, including prodromal symptoms, and all women should be examined carefully for herpetic lesions. Women without symptoms or signs of genital herpes or its prodromecan deliver vaginally. Although cesarean delivery does not completely eliminate the risk for HSV transmission to the neonate, women with recurrent genital herpetic lesions at the onset of labor should deliver by cesarean delivery to reduce the risk for neonatal HSV infection.

Many infants are exposed to acyclovir each year, and no adverse effects in the fetus or newborn attributable to the use of this drug during pregnancy have been reported. Acyclovir can be safely used to treat women in all stages of pregnancy, along with those who are breastfeeding. Acyclovir can be administered orally to pregnant women with first-episode genital herpes or recurrent herpes and should be administered IV to pregnant women with severe HSV infection. Suppressive acyclovir treatment late in pregnancy reduces the frequency of cesarean delivery among women who have recurrent genital herpes by diminishing the frequency of recurrences at term. However, such treatment may not protect against transmission to neonates in all cases. No data support use of antiviral therapy among HSV-seropositive women without a history of genital herpes.

Treatment:

Acyclovir 400 mg orally three times a day, or Valacyclovir 500 mg orally twice a day.

* Treatment recommended starting at 36 weeks of gestation.

9.1.9 STIs Management for Survivors of Rape

Survivors of sexual violence or rape may contract a number of infections like chlamydia, gonorrhea, syphilis and trichomoniasis, for which treatments are available. They are also at risk of contracting viruses like human papillomavirus (HPV), herpes simplex virus type 2 (HSV-2), HIV and Hepatitis B or C viruses.

- Offer STI treatment on your first meeting with the woman or survivor of rape.
- There is no need to test for STIs before treating the survivors.
- Give presumptive treatment for STIs common in the area (for example, gonorrhea, clamydia, trichomoniasis etc).
- Give the shortest courses available in this national guideline, as these are easiest to take.
- Usually compliance with follow-up visits is very poor among survivors of sexual assault or rape. As a result, the following routine presumptive treatment should be provided as an empiric antimicrobial regimen for syphilis, chlamydia, gonorrhea and trichomonas. If the survivor is a woman of reproductive age, please check the woman is not pregnant and not allergic to penicillin.
  - Cefixime 400 mg orally + Azithromycin 1 g orally, single dose; or
  - Ciprofloxacin 500 mg orally + Benzathine Benzylpenicillin 2.4 million IU intramuscularly + Doxycycline 100 mg orally, twice daily for 7 days; and
  - Metronidazole 2 gm of orally as a single dose.
- Estimates of HIV transmission risk per sexual act vary among population groups and are difficult to interpret due to multiple confounding factors. HIV Post-Exposure Prophylaxis (PEP) is not indicated if the exposed person is already HIV infected. Nevertheless, HIV testing needs to be done but HIV testing should be voluntary testing and counseling. Where the individual has limited or no capacity to consent (most commonly children), a parent or guardian can provide consent.
- The new WHO guidelines also provide recommendations for PEP prescribing and adherence support. Prompt PEP initiation (within 72 hours post exposure, but the sooner, the better) and completion of the full 28-day course of ARV drugs for HIV PEP are thought to be required to maximize the benefit of the intervention.
- Preferred antiretroviral regimen for adults and adolescents:
  - TDF + 3TC (or FTC) is recommended as the preferred backbone regimen for HIV PEP in adults and adolescents. (Conditional recommendation, very low quality of evidence).
  - LPV/r or ATV/r is suggested as the preferred third drug for HIV PEP in adults and adolescents. (Strong recommendation, low to moderate quality of evidence).
- Preferred antiretroviral regimen for the children ≤ 10 years:
  - ZDV + 3TC is recommended as the preferred backbone for HIV PEP in children aged ≤ 10 years. (Conditional recommendation, very low quality of evidence).
  - LPV/r is recommended as the preferred third drug for HIV PEP in children aged ≤ 10 years. (Conditional recommendation, very low quality of evidence).

- The hepatitis B virus can be sexually transmitted. Therefore, women subjected to sexual violence should be offered immunization for hepatitis B within 14 days of incidence. In Bangladesh immunization programs now routinely use hepatitis B vaccine for the children; a survivor may already have been fully vaccinated. If the vaccination record card confirms this, no additional doses of hepatitis B vaccine need to be given.
- HPV vaccination is recommended for female survivors aged 9–26 years and male survivors aged 9–21 years.

9.2 Children, Adolescents and STI

9.2.1 STIs in Children and Adolescents

The occurrence of STIs in children with the exception of neonatal infections and congenital syphilis invariably indicates sexual abuse. Health workers therefore, should arrange for emotional as well as legal support for the child as part of the comprehensive management.

Management of children who have STIs requires close cooperation between clinicians, laboratory personnel, and child-protection authorities. Legal investigations, when indicated, should be initiated promptly. Some infections (e.g., gonorrhea, syphilis, and chlamydia) if acquired after the neonatal period, are virtually 100% indicative of sexual contact. For other infections (e.g., HPV and vaginitis), the association with sexual contact is not as clear.

The rates of many STIs are highest among adolescents especially in sexually active younger adolescents. Adolescents are at higher risk for STIs because they frequently have unprotected intercourse, are biologically more susceptible to infection, are engaged in sexual partnerships frequently of limited duration, and face multiple obstacles to using health care. Several of these issues can be addressed by health care providers who provide services to adolescents. Health care providers can address adolescents' lack of knowledge and awareness regarding the risks and consequences of STIs by offering guidance concerning healthy sexual behavior. Healthcare providers should ensure privacy and confidentiality when providing services for adolescents.

Despite the prevalence of STIs among adolescents, providers frequently fail to inquire about sexual behavior, assess risk for STIs, provide counseling on risk reduction, and screen for asymptomatic infection during clinical encounters. Discussions should be appropriate for the patient's developmental level and should be aimed at identifying risky behaviors (e.g., sex and drug-use behaviors). Careful, nonjudgmental and thorough counseling are particularly vital for adolescents who might not acknowledge that they engaged in high-risk behaviors.

9.2.2 Vulnerability of Adolescents to STI and HIV

Factors increasing vulnerability to STI and HIV infections are given in box-1

Box-1: Factors increasing vulnerability to STI & HIV	
Biological Factors	**Social Factors**
• Mucosal tear during sexual act • Underdeveloped vaginal epithelium, which could be easily infected by etiologies of STIs	• Insufficient knowledge/awareness regarding STI and HIV • Lack of knowledge regarding safe sex practice • Multiple sexual partnership • Commercial sex • Poor health seeking behavior • Poor self-esteem • Lack of youth friendly services • Substance Abuse • Peer pressure

9.2.3 Comprehensive approach to reduce risk factors for STI and HIV among adolescents

Adolescents appear to be poorly informed with regard to their own sexuality, physical well-being, health, and bodies. Levels of knowledge they do have, moreover, is incomplete and confused. Low educational attainment, limited sex education and inhibited attitudes towards sex contribute to this ignorance.

An isolated approach will not reduce the risk of vulnerability to STI and HIV. Provision of information, skills and services on sexual and reproductive health issues is key to decreasing the risk. At the sametime, modifying the environment at family and community levels also supports and promotes getting correct information, skills and services to adolescents.

The following strategies need to be undertaken in a holistic manner:

- Creating parental awareness of the importance of establishing the habit of open and respectful discussion.
- Helping youth to adapt to social change in ways that protect them from infection.
- Creating awareness of young women's physiological vulnerability
- Developing and implementing guidelines on youth friendly sexual and reproductive health services and ensuring access to counselling and health services.
- Ensuring that the means of protection are accessible and affordable to every young person who wants to use them.
- Ensuring curriculum development and capacity building for teaching.
- Strengthening the role of traditional mentors and grandparents.

- Supporting policies and programmes directed at increasing age of marriage, age of sexual initiation, and other protective strategies.
- Protecting the human rights and dignity of affected children and youth.
- Supporting national initiatives to increase youth access to livelihood and employment opportunities.

STI and HIV prevention programs among adolescents focus on following issues:

Among adolescents:

- Promote abstinence before marriage.
- Encourage adolescents to choose one faithful partner.
- Encourage visiting health care providers to give adolescents information regarding safe sex, counselling regarding physical and emotional changes during puberty and advising them seek help from adults, parents or schoolteachers whenever needed.
- Advise adolescents to avoid sexual contact with anyone who has visible sores or genital rashes.
- Help young people to seek treatment for their sexual partners if possible.
- Promote use of condoms correctly with every sexual act.

Among service providers:

- Provide information and counselling on sexual and reproductive health issues.
- Provide appropriate service according to individual needs, including referral following protocols or guidelines.
- Provide condoms when needed, irrespective of marital status.
- Maintain privacy and confidentiality.

Among community leaders, teachers, and parents:

- Create an enabling environment in the community so that adolescents and youth can participate in sexual and reproductive health programming such as life skill education.
- Create an enabling environment at the school so that adolescent and youth can feel comfortable in seeking help from the teacher if they face any problem.
- Create an enabling environment at the family level so that adolescent and youth can openly discuss their problems and can seek help from parents or other family members.

9.2.4 Management of STIs in adolescents

The following key issues are useful to remember during management of STI in adolescents.

- Adolescents may have limited access to health care and may not seek care adequately. Therefore, arrangements should be made to ensure compliance and future follow up.
- Partner notification and management is often difficult; thus, risk of reinfection is high.
- Pregnancy should be considered and screening is pertinent in adolescent females.
- STI syndromes in children and adolescents are caused by similar pathogens as in adults and thus follow similar management principles; However, some medications used in adults may not be used for children.

Table-2: Management of STIs in children or adolescents

Syndrome	Infectious agent	Regimen
Urethral Discharge	N. gonorrhoeae C. trachomatis M. genitalium	**Adolescents:** Ceftriaxone 125 mg IM stat **Plus** Azithromycin 1gm orally stat; OR, Doxycycline 100mg two times daily for 7 days **Children**: Ceftriaxone 125 mg IM stat **Plus** Erythromycin 10 mg/kg four times daily for 7 days Note: Use metronidazole 10 mg/kg two times daily for 7 days for persistent symptoms in Children and 500 mg two times daily for 7days in Adolescents:
Vaginal Discharge	N. gonorrhoeae C. Trachomatis T. vaginalis Bacterial vaginosis (BV) Vulvovaginal candidiasis (VVC)	**Adolescents**: Ceftriaxone 125 mg IM stat **Plus** Azithromycin 1gm orally stat; OR, Doxycycline 100 mg two times daily for 7 days **Plus** Metronidazole 500 mg two times daily for 7 days **Children**: Ceftriaxone 125 mg IM stat **Plus** Erythromycin 10mg/kg four times daily for 14 days **Plus** Metronidazole 10 mg/kg two times daily for 7 days
Genital Ulcer	HSV type 2 T. pallidum H. ducryei	**Adolescents**: Acyclovir 400 mg three times daily for 10 days **Plus** Benzathine penicillin 2.4 million units IM stat **Plus** Azithromycin 1 g orally in a single dose; OR, Erythromycin 500 mg three times daily for 7 days **Children**: Acyclovir 10 mg/kg three times daily for 10 days **Plus** B. penicillin G 50,000 units/kg IM, up to the adult dose of 2.4 million units in a single dose **Plus** Azythromycin 30 mg/kg in a single oral dose, OR, Erythromycin 10 mg/kg four times daily for 14 days
PID	N. gonorrhoeae C. Trachomatis Anaerobics	**Adolescents**: Ceftriaxone 125 mg IM stat **Plus** Azithromycin 1gm orally stat / Doxycycline 100 mg two times daily for 14 days / Erythromycin 500mg four times daily for 14 days **Plus** Metronidazole 500 mg two times daily for 14 days

Section-10
Universal precautions

Standard precautions recommended to reduce risk of infection are included in this section. Effective infection prevention practices can protect health care providers, clients and the community at large. Standard precautions are a broad set of clinical practice recommendations designed to help minimize the risk of exposure to infectious materials, such as blood and other body fluids. Standard precautions help break the disease transmission cycle at the "mode of transmission" level. Universal precautions refer to practices preformed to protect health care workers from exposure to blood borne microorganisms. Basic standard precautions refer to the practices performed immediately before, during and after a clinical procedure to reduce iatrogenic infections:

10.1 Hand washing

Hand washing is the one of the most important infection prevention practices, but it is often overlooked. Wash hands:

- Immediately after arrival at work
- Before examining each patient
- After examining each patient
- Before putting on gloves for clinical procedures
- After touching any instrument or object that might be contaminated with blood or other body fluids or after touching mucous membranes
- After handling blood urine or other specimens
- After removing any kind of gloves (hands can become contaminated if gloves contain tiny tears)
- After using the toilet or latrine
- Before leaving work
- There are three types of hand washing used in the clinical setting, each of which is appropriate in different situations:

a) **Hand washing with plain soap and running water:** Removes transient microorganism and soil. After most activities, hand washing with plain soap and water for 30 seconds and rinsing in running water is sufficient. Remove all jewelry from the hands and wrists before hand washing and wet hand with running water. Rub hands together with sop and leather well for 30 seconds following all steps shown in the Figure-1.

b) **Alcohol hand rubs:** Kills or inhibits the growth of transient and resident microorganisms but does not remove microorganisms or soil. This method can be used when hand washing is not possible or practical, and only if hands are not visibly soiled with dirt, blood, or other matter. Because using alcohol alone tends to dry the skin, it is best to use an alcohol hand rub solution. Pour 3.5 ml of alcohol hand rub solution into the palm of the hand. Rub hands and fingers together until they are evaporated.

c) **Surgical hand scrub:** Scrubbing with antiseptics before beginning clinical procedures help prevent the rapid growth of microorganisms for a period of time and will reduce the risk of infections to the patient. A 3-5 minutes' surgical scrub with an antiseptic (such as chlorhexidine or iodophor) and running is recommended before a surgical procedure. Surgical hand scrub may be performed using either a soft brush or sponge, or an antiseptic alone.

Figure 1: Steps of hand washing with plain soap and running water

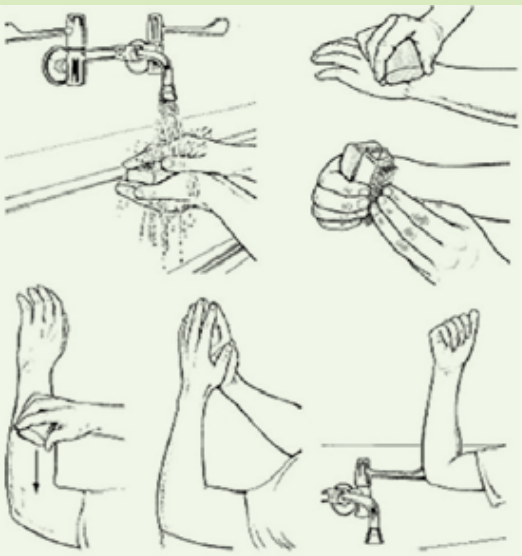
Steps of surgical hand scrub

Step 1: Remove all jewelry from the hands and wrists. Wear OT dress masks, cap and footwear. Wet hands and forearms thoroughly.

Step 2: Clean under each fingernail with a stick or brush, it is important for all surgical staff to keep fingernails short.

Step 3: Holding hands up above the level of the elbow, apply the antiseptic. Using a circular motionbegins at the fingertips of one hand and lather and wash between the fingers, continuing from fingertip to Repeat this for the second hand and arm. Continue washing in this way for 3-5 minutes.

Step 4: Rinse each arm separately, holding hands above the level of elbow.



Step 5: Using a sterile towel to dry the arms from fingertips to elbow using a different side of the towel on each arm.

Step 6: Keep the hands above the level of the wrist and do not touch anything before putting on sterile surgical gloves.

Figure 2: Steps of surgical hand scrub

10.2 Gloving

Gloving provide a barrier against potentially infectious microorganisms that can be found in blood, other body fluids, and waste. There are three kinds of gloves used in the clinical setting. Each is used in different situations:

A. **Surgical gloves:** These should be worn for all clinical procedures where providers will be in contact with the tissues under the skin or with the patient's bloodstream

B. **Single-use examination gloves:** These should be worn for procedures where there will be contact with intact mucous membranes or where the primary purpose of wearing gloves is to reduce the risk of exposure to blood or other body fluids.

C. **Heavy-duty household gloves:** These thick rubber gloves should be worn for handling contaminated instruments and other items for handling waste and linens, for performing housekeeping activities, and for cleaning contaminated surfaces. These gloves can be reused after cleaning.

Steps of wearing sterile surgical gloves are as follows:

Prepare a large, clean, dry area for opening the package of gloves. Either the health provider opens the outer glove package and then perform a surgical hand scrub, or else performs a surgical hand scrub and asks someone else to open the package of gloves. Open the inner glove wrapper, exposing the cuffed gloves with the palms up. Then follow the steps (a to f) shown in figure 3 of wearing sterile surgical gloves.

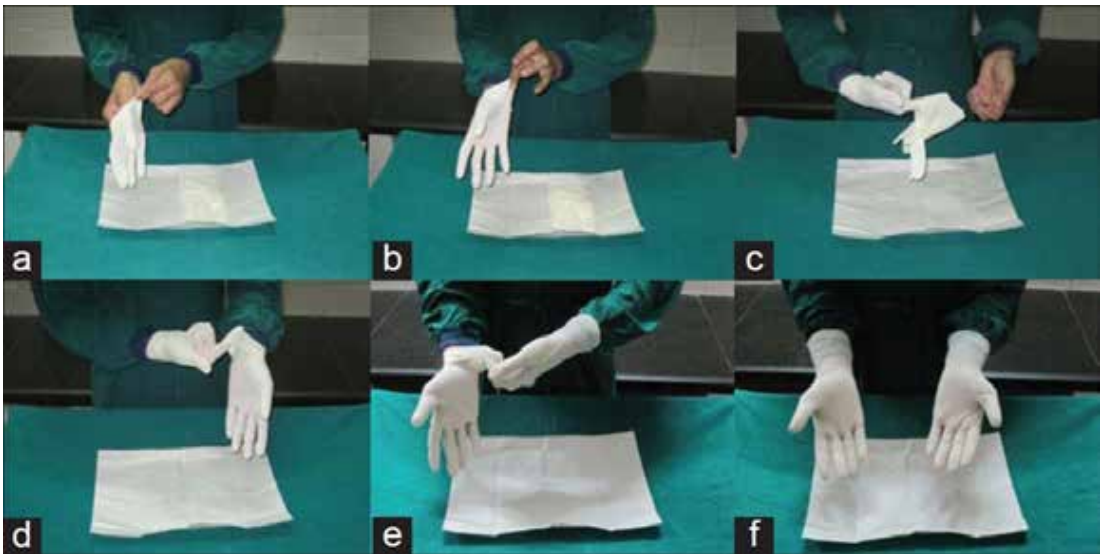
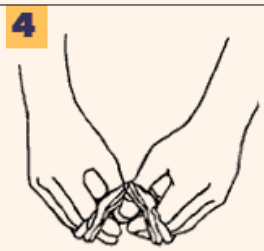


Figure 3: Steps of wearing sterile gloves

Steps of removing surgical gloves are as follows:

Box-1: Steps of removing surgical gloves	
Step 1: Rinse gloved hands in a bucket of decontamination solution to removeblood or other body fluids.	
Step 2: Grasp on the gloves near the cuff and pull it partway off. The glove will turn inside out. It is important to keep the first glove partially on the hand before removing the second glove.	
Step 3: Leaving the first glove over the fingers, grasp the second near the cuff and pullit part way off. The glove will turn insideout. It is important to keep the second glove partially on the hand.	
Step 4: Pull of the two gloves at the same time carefully touching only the inside surfaces.	
Step 5: If gloves are disposable, dispose them properly. If not, place them in a container of 0.5% chlorine solution. If they are to be processed for reuse, place them in a container of decontamination solution.	

10.3 Decontamination

Decontamination, the first step of instrument processing, minimizes the risk of infections to any staff members including doctors, nurses, cleaning and housekeeping staff who handle used instruments or other items that may be contaminated items potentially infectious fluids or tissues. To decontaminate items, use a 0.5% chlorine solution or a solution made from another acceptable disinfectant. Chlorine solution can be made from:

i) **Liquid household bleach:** Because of their low cost and wide availability, chlorine solutions prepared from liquid or powdered bleach are recommended (Sodium hypochlorite). Using Liquid household bleach: Chlorine in bleach comes in different concentrations. Any concentration of chlorine solution can be used to make a 0.5% chlorine solution by using the following formula:(% of chlorine in liquid bleach divided by 0.5%) minus 1=parts of water of each part bleach.

ii) **Bleaching powder:** Chlorine compounds available in powder from (calcium hypo-chlorite or chlorinated lime) Dissolve 20 grams of calcium hypochlorite powder in 1 liter of water in order to get a 0.5% chlorine solution.

Steps of decontamination

Step I: Immediately after use, decontaminate instruments and other items by placing them in a plastic container of 0.5% chlorine solution. Let them soak for 10 minutes.

Step 2: After 10 minutes, remove the items from the chlorine solution and either rinse with or clean immediately. Use utility gloves when removing instruments and other items from a chlorine solution.

Gloves: Before removing contaminated gloves, dip gloved hands into a 0.5% chlorine solution to rinse the outer surfaces and remove blood, other fluids, and tissue. Carefully remove gloves without touching the outer surface with bare hands. If they are surgical gloves that processed for reuse, place them in a container of 0.5% chlorine solution and soak for 10 minutes before cleaning. Rinse or clean it immediately.

Storage containers: Fill containers with a 0.5% chlorine solution and soak for 10 minutes before cleaning. Rinse or clean immediately.

10.4 Cleaning

While decontamination makes items safer to handle, cleaning, the second step in processing, removes organic material, dirt, and foreign matter that can interfere with sterilization or high level disinfection (HLD). Wear utility gloves, a mask and protective eyewear when cleaning instruments and other items.

Step 1: Using a soft brush, detergent and water, scrub instruments and other items vigorously to completely remove all blood, other body fluids, tissue, and other foreign matter. Hold instruments and other items under the surface of the water while scrubbing and cleaning to avoid splashing. Disassemble instruments and other items with multiple parts, and be sure to brush in the grooves, teeth, and joints of items where organic material can collect and stick.

Step 2: Rinse items thoroughly with clean water to remove all detergent. Any detergent left on the items can reduce the effectiveness of further chemical processing.

Step 3: Allow item to air dry (or dry them with clean towel).

Scissors & Vaginal Speculum: Do not use steel wool or wire brush. Immediately after procedure scissors and vaginal speculum should be immersed completely in chlorine solution for 10 minutes, then cleaned with detergent and water by using soft brush-if possible, separately from general Instruments.After cleaning, if scissors and speculum are to be stored, let them air dry and store them in a clean and environment.

Surgical gloves: To avoid tearing gloves, handle it with care. Do not scrub with a brush and always wash gloves separately from other items with detergent and warm water. Rinse in clean water until all detergent is gone. Towel-dry inside and out, or air-dry by hanging gloves in an area of low activity.

10.5 Sterilization

Sterilization, the third step in instrument processing, ensures that instruments and other items are free of all microorganisms (bacteria, viruses, fungi, and parasites), including bacterial endospores. Microorganisms causing infections in patients can be passed during procedures onto the surfaces of items contacting the bloodstream or tissues under the skin.

Two methods of sterilization applied here: steam sterilization (also known as "autoclaving" or "moist heat under pressure") and dry-heat sterilization (hot air oven).

i) Steam sterilization (autoclaving). Steam sterilization in an autoclave is one of the most common forms of sterilization used in health care facilities.

ii) Sterilization (hot air oven): Dry-heat sterilization requires high heat for a specific period of time. Because of the high temperatures, only glass or metal objects can be sterilized by dry heat.

Surgical gloves: Whenever possible, use single-use, disposable surgical gloves that arrive from the manufacturer in a sterile package and are thrown away after one use. When surgical gloves needed to be reused, they must be processed by steam sterilization. Before reuse them, pay particular attention to appropriate processing for gloves.

Scissors: Scissors should be wrapped with non-shiny porous paper and sterilized by steam sterilization under pressure.

Vaginal speculum: Vaginal specula contact patients' mucous membranes or non-intact skin, placing them in the "semi-critical" category of items that require special handling and sterilization or high-level disinfection prior to reuse. Autoclaving is the best choice for sterilizing specula, but if an autoclave is not available, use high-level disinfection.

10.6 High-Level Disinfections (HLD)

When sterilization is not available or feasible, high-level disinfections (HLD) are the third step in instrument processing. There are three methods of HLD: Boiling, chemical HLD and steaming. Many facilities use a method of HLD as a backup to their primary method of sterilization.

Boiling: Boiling is a simple method of HLD that can be performed in any location that has access to clean water and a heat source. Using this method, instruments and other items are placed in a pot or boiler and the water is heated to boiling for 30 minutes.

Steaming: For this method, items are steamed in a steamer containing one to three tiers. Steaming is the best method of HLD for gloves.

Steps of HLD by boiling and steaming are as follows-

Step I: Decontaminate and clean all items to be placed in a sterilizer/boiler for HLD.

Step 2: Water must touch all surfaces for HLD to be achieved, completely submerge all items in the water in the pot or boiler. Open all hinged items and disassemble those with sliding or multiple parts. Place any bowls and containers upright. Not upside-down, and fill with water.

Step 3: Cover the pot or close the lid on the boiler and bring the water to a gentle, rolling boil. When the water comes to a rolling boil, start timing for 30 minutes. Use a timer or make sure to record the time that boiling begins. From this point on, do not add or remove any water and do not add any items to the pot or boiler, lower the heat to keep the water at a gentle, rolling boil.

Step 4: After 30 minutes, remove the items using dry, HLD pickups (lifters, cheatle forceps). Place the items on an HID tray or in an HLD container that is in a low-traffic area away from insects and dust.

Step 5: Allows air-drying before use or storage. Use items immediately or keep them in a covered, sterile or HLD container for one week

A high-level disinfected tray or container can be prepared either by boiling it for 20 minutes or filling it with 0.5% chlorine solution and letting it soak for 20 minutes, draining the chlorine solution and rinsing thoroughly with boiled water.

Chemical HLD: Chemical HLD, like chemical sterilization, is used for heat-sensitive items, like laparoscopes, or when a heat source is not available. Chemical HLD is different because- either glutaraldehyde or chlorine may be used for HLD. HLD items may be rinsed with boiled water.

Process of chemical HLD: Decontaminate, clean, and thoroughly dry all instruments and other items to be processed by chlorine solution. Prepare the 0.5% chlorine solution as describe for decontamination. Fresh solution should be made each day or more often if the solution becomes cloudy. Put the solution in a clean container with a lid. Cover the container, and allow the items soak for 20 minutes. Remove the items from the solution using dry, HLD pickups (lifters, forceps). Rinse thoroughly by boiled water.

10.7 Waste Disposal

Waste generated by health care activities includes a broad range of materials, from used needles and syringes to soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices and radioactive materials.

Poor management of health care waste potentially exposes health care workers, waste handlers, patients and the community at large to infection, toxic effects and injuries, and risks polluting the environment. It is essential that all medical waste materials are segregated at the point of generation, appropriately treated and disposed of safely.

Types of waste

General Waste: non-hazardous e.g. paper, boxes, packing materials, bottles, plastic containers & food-related trash

Medical Waste: materials generated in the diagnosis, treatment and/or immunization, including:

- Blood/blood products, body fluids, used bandages, dressings
- Organic waste: human tissue, body parts, placenta, products of conception
- Sharps: hypodermic needles, suture needles, scalpel blades, blood tubes, pipettes, other glass items

Hazardous Waste: potentially toxic/poisonous waste

Guideline for waste disposal

- Use washable, leak-proof plastic/galvanized containers for disposal of medical waste in OT/ procedure rooms
- Keep waste containers in place convenient for users
- Empty containers daily or when ¾ full
- Never put hands into containers with medical waste
- Always dispose of medical waste correctly, never simply throw
- Always wear heavy utility gloves & shoes when handling & transporting medical waste
- Wash both the gloves before removing & wash hands
- Wash containers with disinfectant cleaning solution & rinse with water daily
- Sharps, liquid waste & hazardous chemical needs special procedures

Disposal of sharps

- Dispose of all sharp items in puncture-resistant containers
- Sharps containers should be kept close to procedure site
- Close sharps container securely when ¾ full
- Never bend, break, or remove needle from syringe
- Sharps are not destroyed by burning, except in large industrial incinerators
- If industrial incinerator not available
  - Burn in small incinerator & bury the block, or
  - Decontaminate the sharps & bury them in pit
- Always wear heavy utility gloves & shoes when handling & transporting medical waste
- Wash both the gloves before removing & wash hands

Disposal of liquid waste

- When carrying or disposing of liquid medical waste, be careful to avoid splashing
- Carefully pour liquid waste down a sink, open drain, non-septic latrine
- Rinse the sink, drain, or latrine thoroughly with water and clean with disinfectant cleaning solution at the end of the day
- Decontaminate the container that held the liquid by filling with 0.5% chlorine & soaking for 10 minutes
- Always wear heavy utility gloves & shoes when handling & transporting medical waste
- Wash both gloves before removing & wash hands

Disposal of hazardous waste

- Handle cleaning solutions & disinfectant like glutaraldehyde, same as liquid waste
- Rinse containers thoroughly with water
- Wash glass containers with detergent & water, rinse thoroughly & reuse
- Do not reuse plastic containers
- Always wear heavy utility gloves & shoes when handling & transporting medical waste
- Wash both gloves before removing & wash hands
- Disposing of cytotoxic chemicals & radioactive waste requires special considerations

Clinical Waste Segregation Process

The collection of clinical waste involves colour-coded containers, which highlight what should be disposed of within each container, as well as how and where they should be transported to for treating or disposal. The colours are organised depending on how hazardous or infectious the contents may be.

Figure 4: Medical waste segregation with color coding

The collected waste transported to the designated area of the health care facility and finally will be hand over to the authorized by to dispose properly.

10.8 Occupational safety

In health care setting, accidental injuries from needles and sharp instruments are the primary cause of occupational exposure to blood borne infections.

In the event of contaminated sharps injury, immediately wash with water and soap or with antiseptic detergent solution. Mucous membranes should be washed repeatedly with water and saline solution. Then:

- Make a note of patient's identification
- Report the event to the clinic supervisor
- Record the event and measures taken in the accident register
- Ensure that any necessary measures are taken to avoid a repeat of the accident

If the accident involved potential exposure to blood: Managing accidents involving exposure to blood borne pathogens.

Pre-exposure prophylaxis

Vaccines: vaccines aginst hepatitis A virus (HAB), hepatitis B virus (HBV) and human papilloma virus (HPV) are available in Bangladesh and should be included in the local occupational safety policies.

Conclusion

Standard precautions are absolutely essential to prevent disease transmission and to minimize the spread of infection. To prevent patients, service providers and community, standard precautions should be institutionalized at each and every health care facility.

Summary of infection prevention (IP) procedure

Table-1: Schedule of IP activities in examination room and laboratory

IP steps	Activities	Schedule	Responsible person	Supervision & Monitoring
Hand washing	Hand washing with plain soap and running water	Immediately after arrival at work Before and after examining each patient Before putting on gloves and after removal of gloves After touching contaminated instruments Before leaving work	Doctors, Nurse and support staff	Clinic supervisor
Gloving	Single-use examination gloves	Whenever in contact with blood and other body fluids During vaginal, ano-rectal and oro-dental examination During contact with patients where exposure to body fluid is anticipated During examination and care of wounds and ulcers When taking specimens such as blood, vaginal, oral swabs	Doctor, Nurse	Clinic supervisor
	Utility gloves	During handling, contaminated instruments and other items, handling waste and lilens, performing housekeeping activities and cleaning contaminated surfaces	Support staff, Nurse	Clinic supervisor
Handling of needles and sharp instruments	Safe handling of needles and sharp instruments	Immediately after use, place the needle and syringe in the puncture proof sharp container is 2/3 full, incinerate the whole container. Immediately replace the full container with a new one.	Doctor, Nurse, Support staff	Clinic supervisor

IP steps	Activities	Schedule	Responsible person	Supervision & Monitoring
Decontamination	Prepare of 0.5% chlorine solution. A container bucket of the solution should be kept in every procedure room, so that used items can be placed directly into the bucket. Service providers should put instruments and other items in the chlorine solution as soon as they are finished using each item. After 10 minutes remove the item from the chlorine solution and either rinse with water or clean immediately.	Every morning when and where necessary	Nurse, Support staff	Clinic supervisor
Cleaning	After decontamination, all instruments should be cleaned with detergent and water	When necessary	Nurse, Support staff	Clinic supervisor
Sterilization	After cleaning, all instruments should be autoclaved	When necessary	Nurse, Support staff	Clinic supervisor
Storage	Clean, safe storage of sterilized or HLD materials	After sterilization or high-level disinfection by autoclaving or boiling	Nurse, Support staff	Clinic supervisor

Section-11
Follow up and Referral for STIs Management

11.1 Follow up and Referral for STIs

11.1.1 Follow up for STI management

Patient follow up and referral is one of the essential step of comprehensive STI management. The importance of follow up visit is:

- To assess treatment adherence, response and ensure cure
- To exclude incubating STIs particularly syphilis
- To offer HIV testing and counseling if not done during the initial visit
- To assess for safer sexual behavior
- To further counsel patient to bring partners if not yet treated

If patient didn't respond to the initial treatment it is good to rule out possible re-infection, treatment incompliance, treatment failure and misdiagnosis. Once re-infection, treatment incompliance is ruled out then patient should be managed in line with treatment failure using etiologic approach.

Uncomplicated cases of vaginal discharge, cervicitis/vaginitis and urethral discharge syndrome should be asked to return if symptoms don't go away or recur. Genital ulcer disease (GUD), PID, scrotal swelling and inguinal bubo should be followed up until the ulcer heals or symptoms resolve. If possible patient of GUD should follow up every quarterly with testing using rapid plasma reagin (RPR). Complicated cases of any STI should be followed up until the patient is well or referred to a specialist.

11.1.2 Referral linkage for STI management

The syndromic approach to STI/RTI case management alone cannot fully address RTI/STI control of a country. Successful syndromic RTI/STI case management must always be supported by a well-organized referral network (laboratory support and specialized service providers).

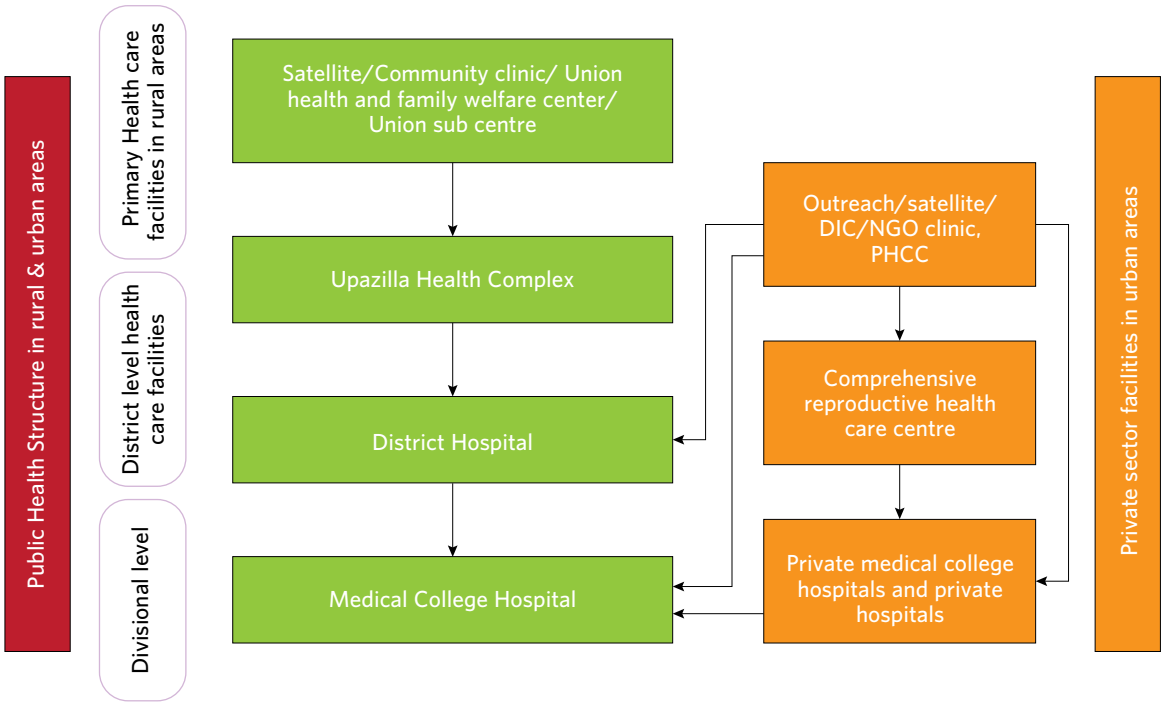
RTI/STI cases may need to be referred in the following situations:

- Patient does not respond to the treatment (persistence cases)
- Patient needs confirmation of the diagnosis by laboratory tests
- Patient has confusing or complex syndrome

Refer patients to a specialist if there is an STI case with complications, whenever the clinician is unsure about the diagnosis of a sick patient and whenever the patient has not responded to recommended therapy. Service provider will provide information on referral services for vaccination against hepatitis B infection for KPs as well as general population. If a patient has not received Hep B vaccination they can be referred for serology and vaccination as required. Service provider will also provide information about vaccine against human papilloma virus, cervical cancer and breast cancer screening to the women of KPs, spouses of KPs and general populations.

Syndromic management is done in facilities at primary health care level e.g. community clinic/ union health and family welfare center within public health system in rural areas of Bangladesh. Syndromic management is also done at primary health care centers of NGOs, satellite clinic/ outreach site in urban areas. In rural areas, syndromic management, serological and microscopic testing are available in upazila health complex. Bacterial culture and molecular techiniques for STI diagnosis are possible in district hospital, maternal and child welfare center, medical colleges and hospitals within public health system and comprehensive reproductive health care center under private health sector in urban areas. Hence, patient will be referred from one facility to the next level of facility depending upon the needs of a client. However, referral linkage for STI case managment is shown in following Flow chart-1.

Flow chart-1: Referral linkage for STI case management at a glance in public & private health facilities.



11.2 Follow up and Referral for HTS

11.2.1 Referral linkage for HIV testing services

Testing for HIV is recommended and should be offered to all persons who seek assessment and treatment for STIs. Encouraging patients with STI cases to receive HIV testing services (HTS) in an effective way to help control the further spread of HIV. Provider initiated testing approach is followed for offering HTS to clients with STIs and receiving treatment. However, the conditions for testing must respect the client's human rights and pay respect to confidentiality. Service providers of both the referring and referral facility should adhere to 5Cs- Consent, Confidentiality, Counselling, Correct test results and Connection (linkage to prevention, treatment and care services) recommended by WHO while providing HTS (Figure-1). Mandatory, compulsory or coercive HIV testing is never appropriate. HTS should always be provided in a respectful, non-discriminatory and ethical manner.

Clients should be linked with either community based or facility-based HIV testing services. Only HIV screening test is done in the community-based facilities. All clients with HIV positive screening result in community settings are linked with facility-based HTS. STI service providing facilities should have functional linkages with the nearest HTS facilities. Depending upon clients' consent and choice, service provider can do either accompanied or unaccompanied referral for HTS.

However, before referring the client, STI service provider should give following information as part of clients' preparedness for HTS:

- Reasons why HIV testing and counseling is being recommended for STI patients
- Clinical and prevention benefits of HIV testing
- Right to decline the offered test and declining an HIV test will not affect the patient's access to other medical services
- Confidentiality of result other than heath care providers directly involved in providing services to the client

The Government of Bangladesh has established HIV testing services in six medical colleges, one 250 district sadar hospital and one Upazila health complex (UHC). Among these, four medical colleges and same district and UHC have separate HTS for pregnant women linked with antenatal care. HTS will remain available in another eight medical colleges and thirteen district sadar hospital. For key populations, HTS is also available in 103 DICs in various geographic region supported by GFATM while managed by Save the Children and icddr,b and implemented by the NGO partners. In addition, 7 more HTS sites are operated by three CBOs/NGOs for both general and key population. Anybody either independently or through referral can seek services from these HTS sites.

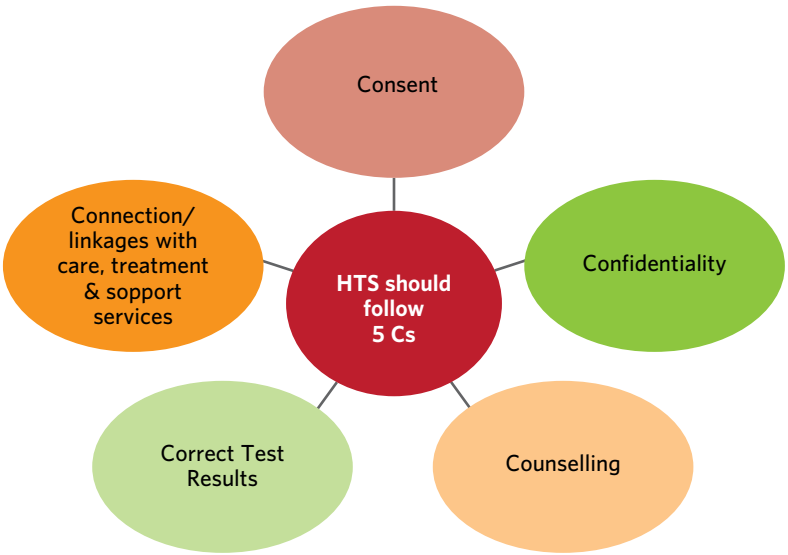


Figure-1: Fundamental principles of HIV testing Services

11.2.2 Follow up of STI patients referring for HIV testing services

For HIV negative clients the follow-up communication encourages maintaining safe sexual practices / regular needle exchange and harm reduction, encourages for repeat testing in case of window period, emotional support and regular contact with the HTS services. For HIV positive clients, follow-up communication (through service provider/counselor/peer navigator) is continued for long-term to monitor adherence to treatment, partner testing and psychological support. Follow-up communication helps the service provider to know if the client is still part of treatment, care and support system or have dropped out. Follow-up helps to track the client and maintains continuum of treatment and care cycle.

11.3 Facilities and Providers for STIs and HTS

In both public and private sector, different level of health care facilities has pre-defined provision of services. For example, syndromic management of STIs services is done at community and primary level of health facilities which lack equipment and human resources for supporting etiological diagnosis. Whereas, upazila and district level facilities including Medical College Hospital have equipment for making etiological diagnosis of STIs. Similarly, HIV screening is done in community outreach, but confirmation is done in designated medical college hospitals in public sector and DICs in private sector.

As of capacity of facilities, skills of service providers vary widely for providing STI diagnosis and management as well as HIV testing services. The following two tables (Table 1 & 2) has portayed the availability of STIs and HTS according to the level of health care facilties and capacity of health care providers.

Table 1: Roles and Responsibilities of Health Providers by Level of Health Facility[101]

	Community		Union	Upazila	District		Medical College Hospital	Urban		
Roles &Responsibilities	SC/OR	CC	UH&FWC/ USC	UHC	DH	MCWC		CRHCC	PHCC	DIC
STI Service										
Syndromic management			✓	✓	x	x	x	x	✓	✓
Aetiological management	x	x	x	✓	✓	✓	✓	✓	x	x
Laboratory Services										
Microscopy	x	x	✓	✓	✓	✓	✓	✓	✓	x
Serology	x	x	x	✓	✓	✓	✓	✓	x	x
Bacterial culture	x	x	x	x	✓	✓	✓	✓	x	x
Molicular techniques	x	x	x	x	✓	✓	✓	✓	x	x
Point of care (POC)	✓	✓	✓	✓	x	x	x	x	✓	✓
HIV screening	✓	x	x	x	x	x	x	x	x	✓
HIV confirmation	x	x	x	x	x	x	✓	x	x	✓

Table 2: Roles and Responsibilities by Level of Health Care Provider

Roles & Responsibilities	CHCP, HA, FWA	Nurse, FWV, MA, SACMO, Midwives, lab technologist	MO/RMO	Specialists: Skin VD Gynecological
STI Services				
Syndromic management	x	✓	✓	x
Aetiological management	x	x	✓	✓
Laboratory Services				
Microscopy	x	x	✓	✓
Serology	x	x	✓	✓
Bacterial culture	x	x	✓	✓
Molicular techniques	x	x	✓	✓
Point of care (POC)	x	✓	✓	✓
HIV screening test	✓	✓	x	x
HIV confirmation test	x	✓	x	x

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Note:

SC	Satellite Clinic
OR	Outreach Center
CC	Community Clinic
UHC	Upazila Health Complex
USC	Union Sub-center
UH&FWC	Union Health & Family Welfare Center
DH	District Hospital
DIC	Drop-in-center
MCWC	Maternal & Child Welfare Center
CRHCC	Comprehensive Reproductive Health Care Center in urban area
PHCC	Primary Health Care Center in urban area

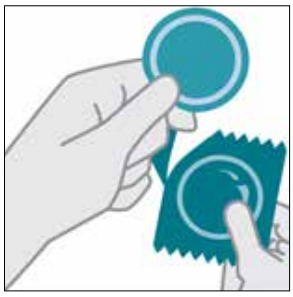
Annexure-1
Steps of right ways of use condom

Steps of right ways of use condom

Check expiry date

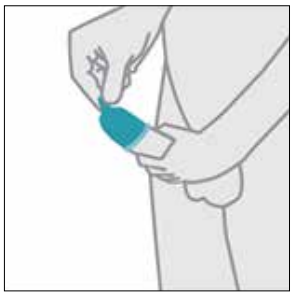
Feel air bubble to check freshness

Check the condom is right side out



Carefully open the package so the condom does not tear

Place condom on head of erect, hard penis. If uncircumcised pull foreskin back.



Pinch air out of the tip of the condom

Continue pinch of the tip and unroll condom all the way down the penis

After sex but before pulling out, hold the condom at the base. Then pull out, while holding the condom in place.

Carefully remove the condom and throw it in the trash.

Condom Dos and Don'ts	
• DO use a condom every time you have sex. • DO put on a condom before having sex. • DO read the package and check the expiration date. • DO make sure there are no tears or defects. • DO store condoms in a cool, dry place. • DO use latex or polyurethane condoms. • DO use water-based or silicone-based lubricant to prevent breakage	• DON'T store condoms in your wallet as heat and friction can damage them. • DON'T use nonoxynol-9 (a spermicide), as this can cause irritation. • DON'T use oil-based products like baby oil, lotion, petroleum jelly, or cooking oil because they will cause the condom to break. • DON'T use more than one condom at a time. • DON'T reuse a condom

Steps for use on the Male Condom

Carefully open the package so the condom does not tear. Do not unroll the condom before putting it on. Continue squeezing tip while unrolling condom until it covers whole of penis. After ejaculation (coming), hold rim of condom and pull penis out before penis gets soft Tie and wrap the condom in paper, (if available) then throw in dustbin. Wash hands. If not circumcised. Pull foreskin back, squeeze tip of condom and put it on end of hard penis. Always put on a condom before entering part Slide condom off without spilling (semen inside. Burn or bury with other trash, wash hands.

Annexure-2
Essential drugs for STI Service Delivery Points

	Drugs	Indication
STI Treatment-1	Ceftriaxone: 250mg by intramuscular injection, as a single dose; or Cefixime: 400mg orally, as a single dose **PLUS** Azithromycin1 gm orally; or Doxycycline* 100mg orally 12 hourly for 7 days; or Erythromycin base 500 mg orally 6 hourly for 7 days	Cervicitis Urethral Discharge Syndrome Scrotal Swelling Syndrome *(NB: Scrotal swelling syndrome requires treatment for chlamydia and gonococcus, Alternative treatment for chlamydia is given below)* **should not be prescribed during pregnancy or lactation.*
STI Treatment-2	Metronidazole* 2gm orally as a single dose; or 500mg 2 times daily for 7 days; or Tinidazole 2gm orally in a single dose	Bacterial vaginosis Trichomonas vaginalis ** Use of metronidazole in first trimester of pregnancy is not recommended unless the benefits outweigh the potential hazards.*
STI Treatment-3	Fluconazole* 150mg orally as a single dose; or Clotrimazole 1% cream 5 g intravaginally daily for 7–14 days; or Clotrimazole 2% cream 5 g intravaginally daily for 3 days; or Miconazole 2% cream 5 g intravaginally daily for 7 days; or Miconazole 4% cream 5 g intravaginally daily for 3 days; or Miconazole 100 mg vaginal suppository, one suppository daily for 7 days; or Miconazole 200 mg vaginal suppository, one suppository for 3 days; or Miconazole 1,200 mg vaginal suppository, one suppository for 1 day	Candida albicans **should not be prescribed during pregnancy or lactation. Clotrimazole or Miconazole 150 mg tab or cream Intravaginally for 3 days can be used.*
PID Treatment	1.Ceftriaxone: 250mg by intramuscular injection, as a single dose; or Cefoxitin 2 g IM in a single dose and Probenecid, 1 g orally administered concurrently in a single dose; or Other parenteral third-generation cephalosporin (e.g., ceftizoxime or cefotaxime)	Pelvic inflammatory disease (PID) **Note: Doxycycline not to be prescribed to females during pregnancy and lactation. Metronidazole not to be prescribed in 1st trimester of pregnancy.*

	Drugs	Indication
	Plus 2. Doxycycline* 100mg orally 12 hourly for 14 days; or Erythromycin base 500mg orally 6 hourly for 14 days **Plus** 3. Metronidazole* 500mg orally 12 hourly for 14 days	
Genital herpes treatment 1	Acyclovir 200 mg five times daily for 10 days or Acyclovir 400mg three times daily for 10 days	First clinical attack of genital herpes and recurrences if severe or complicated.
Genital herpes treatment 2	Acyclovir 400 mg twice daily continuously	Frequent recurrences -if> 6 times/year
Chancroid treatment	Azithromycin 1gm oral single dose; Or Injectable Ceftriaxone 250 mg, IM as a single dose; Or Ciprofloxacin 500 mg two times daily for 3 days*	Nonherpetic genital ulcer unresponsive to syphilis treatment **should not be prescribed during pregnancy or lactation.*
Alternative Chlamydia treatment	Doxycycline 100 mg twice daily for 7 days or Erythromycin base 500 mg 4 times a day for 7 days	
LGV treatment	Doxycycline* 100mg twice daily for 21 days or Erythromycin 500 mg 4 times a day for 21 days	**should not be prescribed during pregnancy or lactation.*
Syphilis treatment 1. Non penicillin allergic including pregnancy	Benzathine penicillin 2.4 IU 1M Single dose	<2 years duration
	Benzathine penicillin 2.4 IU IM weekly for 3 weeks	>2 years duration or unknown duration
Syphilis treatment 2. For Penicillin allergic and NOT Pregnant patient	Doxycycline100mg twice daily for 15 days	<2 years duration
	Doxycycline 100mg twice daily for 28 days	>2 years duration or unknown duration
Syphilis treatment 3. For Penicillin allergic and Pregnant patient	Erythromycin 500 mg four times daily for 15 days	<2 years duration
	Erythromycin 500 mg four times daily for 20 days	>2 years duration or unknown duration *Note: there are recorded incidences* *of treatment failure with erythromycin which may lead to congenital syphilis. In this case, penicillin sensitivity testing in a hospital with full resuscitation facilities may be indicated*

	Drugs	Indication
Genital warts	Patient-Applied: Imiquimod 3.75% or 5% cream; or Podofilox 0.5% solution or gel; or Sinecatechins 15% ointment Provider–Administered: Cryotherapy with liquid nitrogen or cryoprobe; or Surgical removal either by tangential scissor excision, tangential shave excision, curettage, laser, or electro surgery, or, Trichloroacetic acid (TCA) or bichloroacetic acid (BCA) 80%–90% solution	Warts detected on clinical examination (Podophyllin contraindicated in pregnancy)
Pediculosis pubis	Permethrin 5% cream	Eggs or adult lice seen on examination
Scabies	Permethrin 5% cream or, Benzyl benzoate lotion 25% or, Tetraethyl monosulphiram 25%	Burrows, mites, typical rash, insufferable nocturnal itch
Neonatal conjunctivitis (treatment)	Treatment for Neonate Inj. Ceftriaxone 50 mg/kg (max. 150 mg) IM in single dose, **PLUS** Azithromycin Suspension 30 mg kg/day orally in single dose for 3 days Treatment for Parents Inj. Ceftriaxone 250 mg IM in single dose; or Cefixime 400 mg orally in single dose, **PLUS** Azithromycin 1 gm orally in single dose	All neonates with bilateral or unilateral swollen eyelids with purulent discharge should receive treatment for both gonococcal and chlamydial conjunctivitis
Anaphylaxis treatment	Adrenaline 0.5ml 1:1000 1M Stat. Repeat at 5 mininte intervals if required **Plus** Chlorpheniramine 10-20 mg slow IV Injection **Plus** Hydrocortisone 100-300 mg IV injection	Confirmed allergic reaction +See Allergic reaction & anaphylaxis section

DOT= directly observed therapy; bd= twice daily

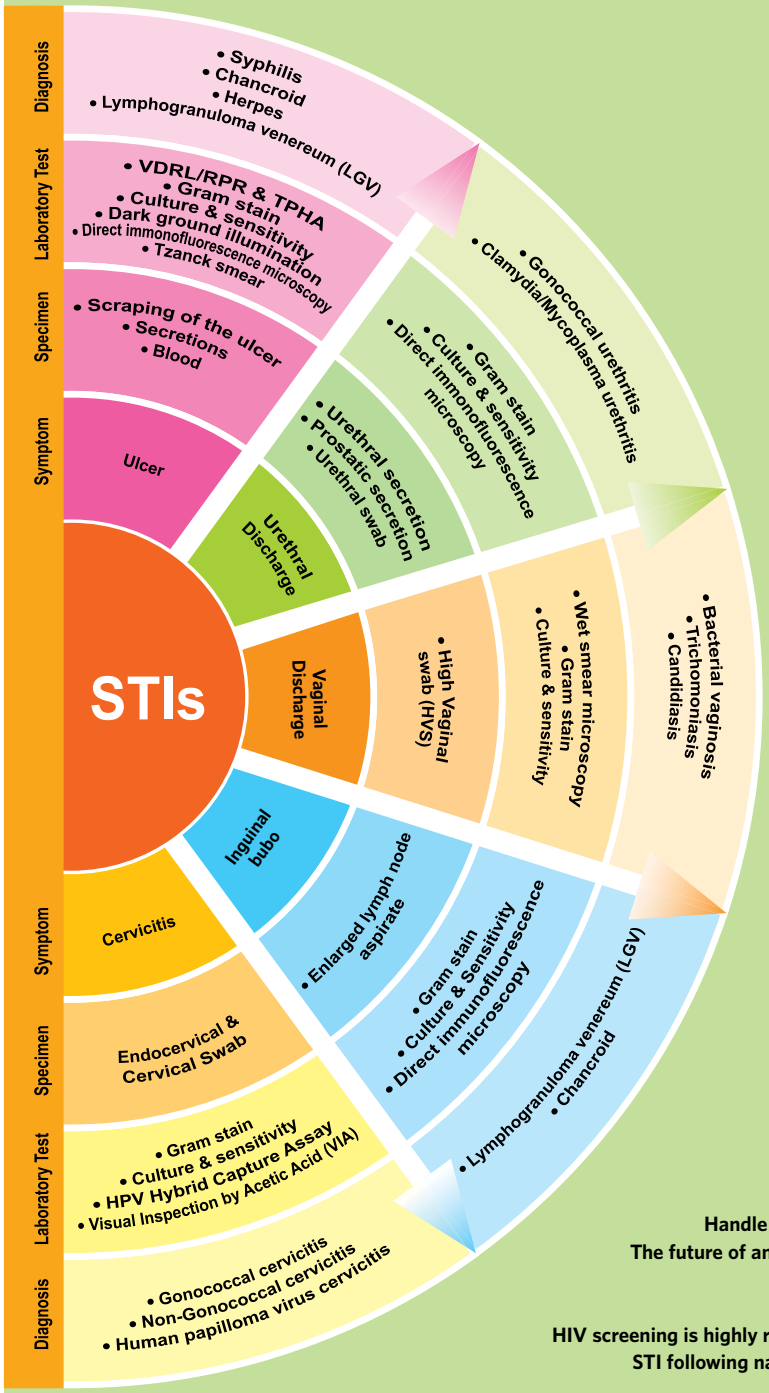
Note: *Metronidazole in pregnancy: Although metronidazole is not recommended for treatment of BV or TV in the first trimester of pregnancy, treatment may be given where early treatment has the best chance of preventing adverse pregnancy outcomes. In this instance, a lower dose should be given: 2g single oral dose rather than a long course for 7 days.*

Annexure-3
Partner Treatment

Primary infection in patient	Recommended partner treatment
Urethral Discharge	Treat partner for chlamydia and gonorrhea with **STI treatment 1**
Cervicitis	Treat partner for chlamydia and gonorrhea with **STI treatment 1**
Vaginitis (Trichomonas and/or Bacterial Vaginosis)	• Doctor makes clinical decision on aetiology. • If TV more likely partner should be treated with Metronidazole 2 g stat or 500mg bd for 7 days. • If BV more likely, partner treatment not required
Pelvic Inflammatory Disease (PID)	Treat partner for chlamydia and gonorrhea with **STI treatment 1**
Scrotal swelling syndrome	Treat partner for chlamydia and gonorrhoea with **STI treatment 1**
Inguinal bubo syndrome	• Azithromycin 1g DOT for chancroid and • Doxycycline 100mg twice daily for 21 days or Erythromycin base 500mg 4 times a day for 21 days for LGV
Genital Ulcer	Treat partner for syphilis and chancroid
Herpes	Partner requires full sexual health history and examination. If herpes lesions are present then treatment for herpes maybe given
Genital warts	Partner requires full sexual health history and examination. If genital warts are present then treatment for genital warts should be given
Neonatal conjunctivitis	Both parents should be treated for chlamydia and gonorrhoea with **STI treatment 1**
Scabies	Treat partner for scabies
Pubic lice	Treat partner for pubic lice

Annexure-4

Etiological Diagnosis and Treatment of Common Sexually Transmitted Infections



Treatment

Syphilis: Inj. Benzathine Penicillin G (2.4 million units) deep IM as a single dose or Doxycycline 100 mg for oral twice daily for 14 days or Erythromycin 500 mg oral 4 times daily for 14 days.

Chancrold: Azithromycin 1 gm oral single dose or Erythromycin 500 mg oral 4 times daily for 7 days or Injectable Ceftriaxone 250 mg IM as a single dose or Ciprofloxacin 500 mg twice daily for 3 days.

Herpes: Acyclovir 400 mg oral 3 times daily for 10 days.

Gonorrhoea & non-gonococcal urethritis and Cervicitis: Inj. Ceftriaxone 250 mg IM in a single dose or Cefixime 400 mg oral in a single dose PLUS Azithromycin 1 gm oral in a single dose.

Lymphogranuloma Venereum: Doxycycline 100 mg oral twice daily for 21 days or Erythromycin 500 mg oral 4 times daily for 21 days.

Bacterial Vaginosis: Metronidazole 500 mg oral twice daily for 7 days.

Candidiasis: Fluconazole 150 mg oral as a single dose or Clotrimazole 1% cream 5 g intra-vaginally daily for 7-14 days or Clotrimazole 2% cream 5 g intra-vaginally daily for 3 days.

Trichomoniasis: Metronidazole 2 gm oral as a single dose or Metronidazole 500 mg oral twice daily for 7 days or Tinidazole 2 gm oral as a single dose.

Handle antibiotics with care.
The future of antibiotics depends on all of us.

HIV screening is highly recommended in all suspected cases of STI following national HIV testing algorithm.

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