HIV RELATED SKIN DISEASES
AND SEXUALLY TRANSMITTED
INFECTIONS IN AFRICA.

An illustrated guide.
# Contents

## Introduction

- Syphilis
- Lymphogranuloma venereum
- Chancroid
- Donovanosis
- Genital herpes
- Urethral discharge
- Gonorrhoea
- Chlamydia trachomatis
- Vaginal discharge
- Mucocutaneous candidiasis
- Trichomoniasis
- Bacterial vaginosis/anaerobic bacteria
- Lower abdominal pain in women
- Ophthalmia neonatorum
- Bubo
- Srotal swelling and epididymitis
- Condylomata acuminata
- Pubic lice

## Sexually transmitted infections

- General introduction
- Genital ulcer
- Syphilis
- Lymphogranuloma venereum
- Chancroid
- Donovanosis
- Genital herpes
- Urethral discharge
- Gonorrhoea
- Chlamydia trachomatis
- Vaginal discharge
- Mucocutaneous candidiasis
- Trichomoniasis
- Bacterial vaginosis/anaerobic bacteria
- Lower abdominal pain in women
- Ophthalmia neonatorum
- Bubo
- Srotal swelling and epididymitis
- Condylomata acuminata
- Pubic lice

## Yeast and fungal infections

- Mucocutaneous candidiasis
- Pityriasis versicolor and other Malassezia infections
- Cryptococcosis
- Dermatophyte infections

## Viral infections

- Human immunodeficiency virus (HIV)
- Herpes simplex
- Herpes zoster
- Oral hairy leukoplakia
- Molluscum contagiosum
- Warts/human papilloma virus
- Kaposi's sarcoma

## Bacterial infections

- Staphylococcal and streptococcal infections
- Mycobacterial infections

## Other skin diseases

- Seborrhoeic dermatitis
- Psoriasis
- Xeroderma
- Papular pruritic eruption (PPE)
- Eosinophilic pustular folliculitis
- Photodermatitis
- Hair disorders
- Nail changes
- Pigmentation
- Gingivitis
- Drug eruptions

## Infestations

- Scabies
**Introduction**

Skin symptoms and signs occur during the course of HIV infection in about 90% of those infected. They are frequently the initial indication of immunodeficiency and, later in the course of the disease, may reflect the immunological status of the patient. Both infectious and non-infectious skin diseases are common. Infections may be caused by viruses like Varicella-zoster virus or Human herpesvirus-8, but also by bacteria, fungi, protozoa and ectoparasites. An infection that persists or reoccurs despite otherwise effective treatment or a skin disease that is atypical, more extensive and aggressive than usually observed must raise the suspicion of HIV infection. Antiretroviral treatment (ART) is the cornerstone in the management of patients with HIV infection. However, ART is not always available, may not be affordable, or cannot be used because of side effects. If ART is effective, the immune function may be restored and many skin diseases improve. Failure of skin diseases to improve during ART, e.g. Kaposi’s sarcoma, may be an indication of lack of compliance or HIV resistance.

This guide provides the health worker with a brief discussion and high quality pictures of the most common dermatoses in pigmented skin and their management in resource limited settings. Sexually transmitted infections are discussed according to the syndromic case management as advocated by the World Health Organisation. We advice to use existing national STI treatment regimens. However, we provide STI treatment regimens that are based on international recognized guidelines.

This illustrated guide will improve the care of individuals with HIV infection throughout Africa for allowing us to make use of some and will allow appropriate allocation of scarce resources in health care.

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**Viral infections**

**Human immunodeficiency virus (HIV)**

The primary infection is often asymptomatic. About half of the infected individuals experience an exanthema. After an incubation period of two weeks (range 11-28 days) there may be flu-like symptoms with fever, malaise, sore throat, headache, enlarged lymph nodes, abdominal discomfort and after about one week of the onset an exanthema may occur. It is asymptomatic, fine maculo-papular, affects more often the face, neck and trunk than limbs and lasts just a few days. It is often missed in the pigmented skin. Eruptions may appear in mouth and on genitals. Seroconversion occurs usually within 4-6 weeks of the acute illness, but may occasionally take up to 6 months.

**Herpes simplex**

Herpes simplex virus (HSV) infections, at oral, anal, genital and extragenital sites are very common in HIV disease. They last longer and may become chronic. Especially in small children, extragenital, severe manifestations may be present. The lesions are not always vesicular, or herpetiform but present more frequently as ulcerations that are resistant to treatment. When the lesions are localized perianally the differential diagnosis includes a cytomegalovirus or an amoeba infection.

**Treatment of HSV infection**

- Acyclovir 200–400 mg 5 times a day, or famcyclovir 250 mg 3 times a day or valacyclovir 500 mg 2 times a day. In chronic cases continuous treatment may be necessary, but may cause resistant HSV strains. In these cases Foscarnet® IV may be tried.
- Povidone iodine (Betadine®) or potassium permanganate soaks (1:5000 or 1:10.000), zinc oxide or tetracycline ointment are used to control the possible secondary infection.
- If effective antiviral therapy is not available or cannot be afforded, symptomatic treatment with a cream containing 2-3% phenol may help against pain.

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1. Maculopapular exanthema in a male patient with early HIV infection.  
2. Enlarged lymphnodes above the cubital fossa.  
3. Chronic ulcerating herpes simplex infection in an HIV infected man.  
4. and 5. Chronic ulcerating vulvar herpes simplex infection in HIV infected women.
Herpes zoster

In many parts of Africa herpes zoster (HZ) infection, present or past, in young and middle aged people, may be an indication of HIV infection.

Varicella, chicken pox, is the primary infection and after that the virus persists in sensory nerve ganglion cells. HZ is the result of reactivation of this latent virus in a partially immune host.

The first manifestation of HZ is usually tenderness and pain along one or several dermatomes on one side of the body. The pain may be severe and accompanied by fever and headache. The time between the onset of pain and rash varies from one to several days. Grouped papules and edematous macules appear, quickly becoming vesicular and then pustular and crusted. HZ in immunocompromized patients is usually more severe, and some have disseminated infections, destructive lesions, ulcerations and even verrucous lesions. If the ophthalmic branch of the trigeminal nerve is involved, it can lead to blindness. About 10 % of HZ patients develop postherpetic neuralgia. This complication is more frequent in elderly and in HIV infected persons. The neuralgia varies in intensity from inconvenient to disabling. The pain can be persistent, burning or shooting in the area involved. This can last from a few months to lifelong.

Treatment of herpes zoster

- If available, antiviral therapy should be started as early as possible, preferably within 48-72 hours after the appearance of the rash. Acyclovir 800 mg 5 times daily or valacyclovir 1000 mg 3 times or famcyclovir 500 mg 3 times daily for one week.
- Analgesics with nonsteroidal anti-inflammatory drugs, e.g. indomethacin or ibuprofen. If these cannot control the pain or the pain seems to be prolonged, give amitriptylin 25-75 mg in the evenings for burning pain and anticonvulsants for shooting pain. Carbamazepin must be started with low dose 200 mg in the evenings and increased up to 600-800 mg daily if needed. Topical 3-5% phenol in cream or ointment base, 2-6 times daily in the acute phase is helpful as well.
- Povidone iodine (Betadine®) or potassium permanganate (1:5000 or 1:10.000) soaks may prevent secondary infection. Calamine lotion for vesicular lesions may relief pruritus For severe secondary bacterial infection provide oral antibiotics.

6. Eczema herpeticum i.e. disseminated herpes simplex infection.
7. Herpes zoster affecting more than one dermatome was the first sign of HIV infection.
8. Recurrent herpes zoster in an HIV infected woman.
Oral hairy leukoplakia
Oral hairy leukoplakia presents as rough, whitish, keratinized streaks and plaques at the lateral side of the tongue. It is usually asymptomatic. Contrary to candidiasis the lesions cannot be scraped away. Epstein-Barr virus has been found on the affected epithelia. The condition may be seen in the early stage of HIV infection but it is more common in the later stages.

Treatment of hairy leukoplakia
Treatment is seldom indicated. If needed, topical acyclovir or cryotherapy may be tried.

Molluscum contagiosum
These dome shaped skin colored papules are caused by a poxvirus. They have a central dimple and are usually 1-5 mm wide, but in HIV infection the lesions may grow up to pea size and loose the characteristic umbilication. Widespread infection on the face, especially on the eyelids is very common and, in adults, highly characteristic of HIV infection. In children they are often self-limiting but if persistent they may be a sign of HIV infection. Giant mollusca can mimic cryptococcosis.

Treatment of mollusca contagiosa
- Curettage
- Caustic treatment with a silver nitrate pencil
- 80% phenol solution
- Cryotherapy with liquid nitrogen.

9. Oral hairy leucoplakia with white streaks and plaques on the lateral side of the tongue.
10. Multiple mollusca contagiosa in a man with HIV infection.
11. Infected mollusca contagiosa on the face of a 6 year old boy with HIV infection.
Warts/human papilloma virus

Human papilloma virus (HPV) infections are common also in healthy people, like common warts or flat warts in children and teenagers and, condylomata acuminata in sexually active age groups. Individuals with HIV infection may have unusually widespread and persistent lesions.

Flat warts may present as extensive as in epidermodysplasia verruciformis, simulating pityriasis versicolor and showing linear configurations in scratch marks. The incidence of digitated, facial and intraoral warts has increased. Condylomata acuminata may form giant lesions that can become secondary infected.

Treatment of HPV infections

- In patients with HIV infection the warts may spread and grow quickly and are especially difficult to treat. Usually one must be content with controlling them with keratolytics, caustic fluids, surgery or cryotherapy.

Common warts:
- Keratolytic therapy with salicylic acid 25% ointment overnight, bathing in warm water and scraping the softened keratin away. Repeat this several times a week.
- Salicylic acid 10-20% and lactic acid 10-20% in collodion.
- Slight electrodessication and curettage.
- Cryotherapy with liquid nitrogen.
- Duct tape (or other occlusive sticky tape). Apply the tape, covering the wart, and leave for 6 days. Repeat the procedure after removal of softened keratin.

Plantar warts:
- Treat as common warts, but avoid destructive procedures

Flat warts:
- Salicylic acid 2-5% ointment.
- Slight cryotherapy with liquid nitrogen may be used, but flat warts are usually best left alone.

12. Flat warts.
Condylomata acuminata:
- Podophyllin 10-25% solution. Apply it carefully on the warts with cotton stick, leave it on for 4-6 hours, wash off with water and soap. Repeat the treatment weekly. Contraindicated during pregnancy.
- Cryotherapy with liquid nitrogen
- Topical 5-fluorouracil cream. Apply 1-7 times weekly. Contraindicated during pregnancy.
- Imiquimod cream 3-4 times weekly. If severe inflammation appears, let it calm down before continuing the treatment
- For secondary bacterial infection use Povidone iodine (Betadine®) or potassium permanganate soaks (1:5000 or 1:10,000) or gentian violet 0.5% painting.

15. Infected condylomata acuminata.
16. A giant ulcerating condyloma acuminatum with malignant transformation.
17. Giant condylomata acuminata.
18. Multiple condylomata acuminata in the male genital area.
19. Condylomata acuminata of the perianal skin.
20. Condylomata acuminata of the foreskin.
Kaposi’s sarcoma
Kaposi’s sarcoma (KS) is a multifocal neoplastic process causing proliferation of lymphatic endothelium, vascular endothelium and the formation of vascular skin or mucous membrane lesions. It is associated with Human Herpesvirus-8 infection. The incidence of KS has increased dramatically with the HIV epidemic and may indicate severe immunosupression in the individual.

The African, non-HIV associated, endemic, KS manifests in two forms. In adults it is mostly present unilateral in lower limbs and in children it is often fulminant in the lymph nodes.

HIV associated, epidemic KS usually starts as purple-black macules, which develop to plaques and progress to 1-3 cm wide nodules. The lesions may coalesce, be tumorous or ulcerate. KS can cause gross oedema or infiltrate the skin making it hard as rock on palpation. The lesions may appear on the face, in the mouth, on the genitalia, on the trunk and on the extremities.

There are different clinical forms of HIV associated KS
- Nodular KS affecting mainly feet and legs
- KS starting with lymphoedema
- KS of the mucous membrane, especially observed on the palate. The oral mucosa is the initial site in 10-15 % of cases.
- Lymphonodal KS
- Verrucous KS
- Ulcerating KS in early stages
- Diffuse firm hyperpigmentation
- Cavernous KS

In the late stages of HIV infection, up to 80% of the patients with KS have gastrointestinal involvement. This may be asymptomatic or cause weight loss and abdominal pain. Also pulmonary lesions are common and can manifest as shortness of breath, fever or cough. Diffuse interstitial infiltration, pulmonary nodules and pleural effusion may be seen on chest X-ray examination. The differential diagnosis of cutaneous KS is a benign vascular proliferation, lymphangiosarcoma or prolonged venous hypertension of the lower legs.

21. Kaposi’s sarcoma can start as a reddish macule.
22. Purple nodules of Kaposi’s sarcoma on the nose.
23. Kaposi’s sarcoma on the palate.
24. Kaposi’s sarcoma with papules and nodules.
Treatment of KS

- The preferred mode of treatment is starting antiretroviral therapy for HIV infection since this may lead to complete remission of epidemic KS. Failure of KS to respond to antiretroviral therapy should raise the suspicion of lack of compliance or resistance of HIV to therapy.

- Limited skin disease may be treated with cryotherapy with liquid nitrogen or intralesional vinblastine (0.2 mg/ml, with 1 ml for 5 cm² of skin lesion) or radiation therapy. Extensive disease will need radiotherapy or chemotherapy.

- Drugs used in KS: Bleomycin 15 mg IM daily or 5 mg IM daily for 3 days every two weeks, etoposide 50 mg daily orally for 7 days every 2 weeks, vincristine 2 mg IV weekly for 3 to 6 weeks. Chlorambucil, cyclophosphamid, interferon alpha and interleukin-2 have also been used with variable effect.

25. Lymphedema of penis and thighs in Kaposi’s sarcoma.
26. Multiple black plaques and nodules of Kaposi’s sarcoma.
27. Kaposi’s sarcoma of the eyelids.
28. Dark nodules and papules of Kaposi’s sarcoma on the glans penis.
29. Ulcerating verrucous nodules of Kaposi’s sarcoma.
30. Woodlike infiltration of the thigh in Kaposi’s sarcoma.
Yeast and fungal infections

Mucocutaneous candidiasis
Mucocutaneous candidiasis is extremely common in HIV infected individuals. It may affect the oral cavity, the pharynx, the oesophagus, the genitalia and the skin folds.

Treatment of mucocutaneous candidiasis
- Gentian violet solution 0.5% is cheap and effective, but messy.
- Topical nystatin and azole-preparations may be used.
- Wet, oozing lesions are best treated with potassium permanganate 1:5000-1:10,000 baths.
- In severe cases fluconazole 50-200 mg daily is the treatment of choice. Intermittent administration of fluconazole 150 mg to 200 mg once a week is recommended in recurrent cases.

Pityriasis versicolor and other Malassezia infections
Malassezia organisms are yeast that colonize the skin and may cause extensive pityriasis versicolor eruptions affecting mainly the upper part of the body and folliculitis appearing as itchy tiny papules. Malassezia folliculitis must be differentiated from acne and other causes of folliculitis.

Treatment of pityriasis versicolor
- Selenium sulphide suspension (e.g. Selsun shampoo) on the scalp and upper part of the body and affected areas over night for 2 weeks or at least for 10 minutes twice a week for 4 weeks.
- Sodium thiosulphate 20% solution overnight for 2-4 weeks (to avoid toxic irritation coconut oil may be applied after washing with selenium sulphide and sodium thiosulphate.)
- Ketoconazole shampoo twice a week for 4 weeks
- Imidazole cream twice daily for 4 weeks
- In severe cases ketoconazole 400 mg stat. The treatment is more effective, if the patient is sweating a few hours after ingesting the drug, because it is secreted in the sweat.
- After treatment hypopigmentation persists until repigmentation occurs after sun exposure.

Treatment of Malassezia folliculitis
- Salicylic acid 5% + sulphur 5% cream overnight for 2-4 weeks
- Systemic treatment with ketoconazole is usually needed.
Cryptococcosis
Cryptococcus neoformans is one of the most important opportunistic pathogens in patients with HIV infection causing meningitis and pneumonia. It may also cause skin lesions and presents as painless papules and nodules especially on the face and on the neck. The papules may resemble mollusca contagiosa or warts.

Treatment of cryptococcosis
Systemic azole antifungals (itraconazole and fluconazole) or amphotericin B in usual doses are effective in cutaneous cryptococcosis and may be given for prolonged periods of time.

Dermatophyte infections
Superficial ringworm, tinea infections may be exceptional widespread and appear atypical. Proximal onychomycosis is much more common in HIV infected patients than in immunocompetent people.

Treatment of dermatophyte infections
- An imidazole cream or Whitfield ointment twice daily for 4-5 weeks
  Systemic treatment is usually needed:
- Griseofulvin 500 mg once daily for 4-6 weeks, for 10-12 weeks in tinea capitis
- Itraconazole 200 mg or terbinafine 250 mg once daily for 2-4 weeks, for 4-8 weeks in tinea capitis.
Bacterial infections

Staphylococcal and streptococcal infections

Recurrent and persistent staphylococcal and streptococcal infections, such as impetigo, folliculitis, and furunculosis are common. Secondary infections of other skin lesions e.g. candidiasis, or herpes lesions may even cause sepsicaemia in HIV infected individuals. Otherwise rare skin infections like cellulitis caused by Haemophilus influenzae, and botryomycosis can occur.

Treatment of bacterial infections

- Potassium permanganate soaks (1 :5000 or 1 :10,000)
- Gentian violet painting 0.5%

Systemic antibiotics:
- Tetracyclines, cephalosporines or macrolides for superficial infections,
- Penicillin for streptococcal infections
- Cephalosporines or clindamycin for deep infections.

Mycobacterial infections

Although pulmonary tuberculosis is very common in patients with HIV infection, skin tuberculosis is not. Direct infections and ulcerations of skin overlying infected lymph nodes (scrophuloderma) or infected bones can occur.

Treatment of Mycobacterium tuberculosis skin infection

Multidrug therapy as for pulmonary TB is necessary.

Inoculation of atypical mycobacteria may occur. Especially M. avium intracellulare is fairly frequently seen in patients with HIV infection. It may cause a draining lymphadenitis, papulopustular and papulonercrotic eruptions.

Clinical leprosy does not seem to be more prevalent in HIV infection. This may be due to the depressed cell mediated immunity, which is needed to create the clinical symptoms in leprosy.
Other skin diseases

Seborrhoeic dermatitis
Seborrhoeic dermatitis is an early symptom and very common in patients infected with HIV. It may manifest as eczema in the seborrhoeic areas, but may also present with lichenified, wet areas in the skin folds, behind the ears, in the axilla, in the groins and genital area and may spread all over the body as well. Secondary bacterial infection is common.

Treatment of seborrhoeic dermatitis
- Sulphur 2-5 % cream
- Ketoconazole shampoo twice a week
- Weak to moderate strength corticosteroid cream (e.g. hydrocortisone or betamethason)
- Imidazole cream twice daily for several weeks
- In severe cases systemic azole treatment (e.g. ketoconazole 200 mg daily for 1-2 weeks, Itraconazole 100-200 mg daily for 1-2 weeks).

In cases with secondary infections or weeping skin lesions use
- Potassium permanganate soaks or bath (1 :5000 or 1 :10.000) and gentian violet painting 0.5%

45. Extensive seborrhoeic dermatitis covering the whole scalp and resembling psoriasis.

46. Seborrhoeic dermatitis in the groins and on the genitals is very common in HIV infected patients.
Psoriasis
Psoriasis may erupt during HIV infection and is more often erythrodermic than plaque type. It may disappear when the immune system deteriorates.

Treatment of psoriasis
- In widespread disease or if active arthritis is present, methotrexate 7.5 – 15 mg once a week with folic acid is usually effective and may be used in patients with HIV infection. NSAID e.g. indomethacin or naproxen for pain relief.
- In less severe cases topical treatment with salicylic acid 2-5 % ointment, coal tar 5-10%, vitamin D preparations (calcipotriol and calcitriol) and potent corticosteroid ointments.

Xeroderma
Dry itchy skin is common in patients with HIV infection. The reflection of light seen on healthy pigmented skin is lost.

Treatment of xeroderma
- Avoid washing with drying substances such as medicated soaps
- Use emollient abundantly. Consider adding urea 5-10% or lactic acid 3-5%
- If the skin is eczematized, use a mild topical corticosteroid ointment
- Antihistamines may be tried

47. Plaque type psoriasis of the leg.
48 and 49. Psoriasis vulgaris of the back.
50. Chronic erythroderma.
Papular pruritic eruption (PPE)
PPE is extremely itchy, chronic and widespread papular eruption frequently seen in patients with HIV infection for which no other cause can be found. Recently it was suggested that PPE might be an exaggerated response to insect bites. The condition is quite therapy resistant.

Treatment of PPE
Treatment is symptomatic with
- Calamine lotion or phenol 1% + zinc lotion or menthol 5% lotion or potent corticosteroid creams.
- First generation antihistamines: hydroxyzine 25-50 mg or promethazine 25-50 mg in the evenings to relieve pruritus
- PUVA treatment has given the best temporary relief
- Systemic corticosteroids may be tried for a restricted time period
- Dapson 100 mg daily
- Treat secondary bacterial infections with topical antiseptics (Povidone iodine) or if severe with systemic antibiotics.

Eosinophilic pustular folliculitis
An itchy non-infectious eosinophilic folliculitis may occur. The lesions may be papular or large polycyclic plaques. The diagnosis can be made by staining a smear from the follicular content.

Treatment of eosinophilic pustular folliculitis
- The same options listed above in connection with PPE may be tried

Photodermatitis
Photosensitivity is quite common among patients with HIV infection. There is hyperpigmentation, eczematous eruption and lichenification on sun-exposed areas. The photosensitivity can be severe and progress to a chronic actinic dermatitis.

Treatment of photodermatitis
- Sun protection with clothing, hats and sun protecting creams
- Moderate to strong corticosteroid ointments

Hair disorders
There is often diffuse alopecia in HIV patients, not only on the scalp, but also on other body parts. Premature greying of scalp hair occurs in adults and loss of hair curls is a common feature. In late HIV infection the patient may show elongation of the eyelashes. There is no therapy available.

51-54. Papular pruritic eruption.
55. Eosinophilic folliculitis.
56. Hair changes and seborrhoeic dermatitis
Nail changes
Zidovudine may cause a diffuse brownish pigmentation of the nails. Blue nail plates have been reported as a manifestation of HIV infection. Brittle nails and nail dystrophy can also be seen. There is no therapy available.

Pigmentation
Diffuse or localized hyperpigmentation of the face, oral mucosa or flexural areas may be related to HIV infection itself or postinflammatory following dermatitis or infections. Also antiretroviral therapy may cause hyperpigmentation on the light exposed areas of the body.

Gingivitis
Gingivitis and periodontitis are common in HIV infection and may progress to ulcers, gangrenous stomatitis and dental loss. Therefore careful dental care is important.

Drug eruptions
Drug eruptions and multiple drug hypersensitivity are more common in patients with HIV infection. There may be exanthema, urticaria, erythema multiforme and toxic epidermal necrolysis.

57. Photodermatitis.
58-60. Toxic epidermal necrolysis.
Infestations

Scabies

Scabies is an infection with Sarcoptes scabiei var. hominis, a mite of about 0.3 mm. that infects only human beings. It is transmitted from person to person by prolonged skin contact or sometimes by sharing clothing or bed linen. In a first infection, itching starts about 3 to 6 weeks after inoculation. Burrows, tiny pinpoint papules, or vesicles are found mostly on the finger webs, the flexor surface of the wrist, the elbows, the genitalia, anterior axillary fold, the waist area and umbilicus and in females around the nipple. Papules found on the male genitalia are almost pathognomonic for scabies. Children may have lesions on the palms and soles. Skin lesions may become secondary infected. A scalpel is used to remove the horny layer as a whole and examine for ova, faeces and mites under the microscope. In crusted (Norwegian) scabies the skin is infested with literally millions of scabies mites. There is crusted hyperkeratosis of the palms and soles, the extremities, buttocks, penis and wrists. Removal of the crusts reveals a moist, reddened surface. Generalized lymphadenopathy is usually present.

Treatment of scabies

- Every member of the family should be treated at the same time to avoid reinfection.
- Lindane 1% lotion for 24 hours, children 12 hours. Contraindicated during pregnancy and breastfeeding and in infants under 6 months of age.
- Benzyl benzoate 25% for three consecutive nights. Repeat the treatment after 10 days. Benzyl benzoate is rather irritating, but safe for pregnant and lactating women and infants under 6 months.
- Sulphur 5-10% ointment for three consecutive nights. This is cheap and safe for pregnant women and small infants
- Permetrin 5% cream for 24 hours, children 12 hours
- Ivermectine 0.2 mg/kg taken as a single dose

The following procedure must be followed: Wash the body. Rub the medication all over the skin from neck to toes. In children under one year, the scalp must be treated as well. Wash the medication off after 12-24 hours. Itching may persist for up to 2-3 weeks after successful therapy. This is treated with the application of emollient and/or mild to medium strength topical steroids.

61. Scabies mite.
62. Excoriations due to scabies.
63 and 64. Scabies.
65. Scabies nodules on the scrotal sac.
66. Crusted scabies.
Sexually transmitted infections

General introduction

Sexually Transmitted Infections (STI) cause significant morbidity, mortality and are an important cause of social stigmatization. The natural history and clinical findings of traditional STI, such as chancroid and genital herpes, has changed due to co-infection with HIV. Also the presence of traditional STI increases the risk of HIV transmission.

There are effective national guidelines for the treatment of STI. These should be followed because they are tailored to the specific diseases and their causes in a given country. The therapy advice that we offer here has to be interpreted in that regard.

Syndromic management is based on identifying consistent groups of symptoms and easily recognized signs, thus establishing a syndromic diagnosis and then providing treatment, which will deal with the majority of organisms responsible for producing each syndrome.

Efficient syndromic case management of patients with STI also aims at reducing and preventing future risk-taking behaviour, providing condoms and at ensuring sexual partners are treated correctly.
Genital ulcer
Genital ulcers may be painful or painless, clean or superinfected, and may be accompanied by inguinal lymphadenopathy.

Genital ulcers can be caused by Treponema pallidum (Syphilis), Haemophilus ducreyi (Chancroid), Chlamydia trachomatis (Lymphogranuloma venereum), Klebsiella granulomatosis (Donovanosis), Herpes simplex; and less likely causes are carcinoma, trauma, scabies, fixed drug eruption.

Treatment of genital ulcers
- Benzathine penicillin G, 2.4 million units by intramuscular injection. Usually this is given as two injections at separate sites PLUS Erythromycin 500 mg. orally, 4 times daily for 7 days.*
  * In the presence of HIV co-infection the response to treatment of chancroid may be delayed and prolonged treatment may be necessary.

Syphilis

Primary syphilis
In syphilis there is usually one indurated and painless ulcer with well-defined margins. The primary chancre is commonly found in the coronal sulcus, on the glans or on the penile shaft, and in women on the labia and even on the cervix. The ulcer does not bleed to the touch. Instead of the classic chancre the primary syphilitic lesion may be papular and/or crusted or mimic balanitis. The inguinal lymph nodes may be moderately enlarged, bilateral but not tender. The lesion of primary syphilis will heal spontaneously within 6 weeks and if untreated the patient may progress to the second stage of syphilis.

Secondary syphilis
The skin eruption seen in secondary syphilis may mimic several other skin conditions, such as pityriasis rosea, eczema, psoriasis, folliculitis and genital warts and is often prominent on palms and soles. The skin eruptions are usually not itchy. Condylomata lata (raised moist verrucous lesions) are commonly found in the genital region. Mucous lesions are asymptomatic erosive patches on the mucous membranes of the oral cavity or genitals.

Late stages of syphilis
In late syphilis there may be nodules, or gummatous lesions which cause the skin to break down and form punched-out necrotic ulcers. They may occur in the oral cavity, nose and throat and are usually painless.

Lesions of the skeletal system in late syphilis include periostitis, osteitis and osteomyelitis.

Eye lesions include iritis and chorioretinitis and may result in visual impairment. In cardiovascular lesions asymptomatic aortitis may lead to diffuse dilatation of the ascending aorta and eventually to calcification.
General paresis is a form of neurosyphilis, which may present as psychotic manifestations, tremors, speech defects and reflex abnormalities. Tabes dorsalis is applied to symptoms from posterior spinal cord degeneration such as, loss of reflexes of the legs, ataxia, loss of sensation of the lower legs and feet, lancinating pains of the legs, abdominal pain, Argyll-Robertson pupil and loss of vision.

**Congenital syphilis:**

Early congenital syphilis develops before the age of 2 years. Typically the child is underweight, pale and shrunken. The earliest manifestations usually are bullous lesions localized to the palms and soles, with paronychia, mucous patches producing a purulent or hemorrhagic discharge ('snuffles'). Maculopapular, or pustular lesions, condylomata lata or infantile alopecia of the eyebrows may occur. Osteochondritis of the long bones may cause 'syphilitic pseudoparalysis' or later osteoperiostitis of the proximal phalanges may lead to 'syphilitic dactylitis'.

Prevention measures that can be taken include reduction of early infectious syphilis in the general population, by 1) treating primary and secondary syphilis and active case detection through contact tracing, and 2) follow-up and treatment of VDRL positive blood donors. Apart from the routine antenatal RPR screening of pregnant women, high-risk women should be rescreened in the third trimester of pregnancy, thus preventing reinfection in the later part of pregnancy.

**The clinical stages of syphilis**

**Primary syphilis:** 3-4 weeks after the infection; Primary ulcer: 3-15 mm, hard and initially painless; Enlarged regional lymphnodes; Syphilis serology may be negative in the beginning.

**Secondary syphilis:** 1.5 – 2 months after the infection; General symptoms include fever, headache, lymphadenopathy; Skin symptoms include roseola, palmoplantar syphilides, condylomata lata, mucous patches, later diffuse alopecia; Syphilis serology is positive.

**Late syphilis:** 4-40 years after the infection, Cardiovascular or neurological symptoms; Syphilis serology may remain positive for prolonged periods of time even after effective treatment.
Treatment of syphilis:
- Benzathine penicillin G, 2,4 million units by intramuscular injection. Usually this is given as two injections at separate sites
- Alternative regimen:
  - Aqueous procaine penicillin G, 1,2 million units daily by intramuscular injection for 10 consecutive days
  - Tetracycline, 500 mg. orally, 4 times daily for 30 days, OR
  - Doxycycline, 100 mg. orally, twice daily for 30 days
- Penicillin-allergic non-pregnant patients:
  - Tetracycline, 500 mg. orally, 4 times daily for 30 days, OR
  - Doxycycline, 100 mg. orally, twice daily for 30 days

Syphilis in pregnancy:
- Pregnant women at all stages of pregnancy, who are not allergic to penicillin, should be treated with Benzathine penicillin G, 2,4 million units, IM, weekly, for 3 consecutive weeks
- Penicillin-allergic pregnant patients:
  - Erythromycin, 500 mg. orally, four times daily for 30 days

Congenital syphilis:
- Referral to a specialist is advised.
- All infants born to sero-reactive mothers should be treated with intramuscular doses of Procaine penicillin 50,000 U/kg, bodyweight, daily for 10 days, despite the fact that mothers were treated during pregnancy with or without penicillin.

Lymphogranuloma venereum
Lymphogranuloma venereum (LGV) is caused by Chlamydia trachomatis, serotype L1, L2, L3. LGV presents with a single, small, non-painful ulcer that soon heals and frequently passes unnoticed. LGV is accompanied by tender inguinal and femoral glands that may give rise to bubo formation. A fluctuant bubo can rupture, discharging thick pus, and healing with fibrosis and strictures causing lymphedema. Women can also present with proctocolitis, and involvement of deep iliac or perirectal lymph nodes, causing lower abdominal pain. This can be complicated by perirectal abscesses, fistulas and strictures causing rectal stenosis.

Treatment of LGV:
- Doxycycline 100 mg. orally, twice daily for 14-21 days
- Alternative regimen:
  - Erythromycin 500 mg. orally, 4 times daily for 14-21 days

73. Papular lesions on the face of a young woman with secondary syphilis.
74. Mucous patches
75. Condylomata lata on the anogenital area resemble condylomata acuminata, but are usually soft and moist.
Chancroid
Infection with Haemophilus ducreyi causes chancroid and the incubation period is between 4-10 days. A papule or pustule occurs that rapidly breaks down to form multiple, large, soft and purulent ulcers, located in the coronal sulcus or on the penile shaft. In women the ulcers are often located on the labia. The ulcers may be complicated by tissue destruction, and phimosis or paraphimosis. The lesions are typically painful. The inguinal lymph nodes may become enlarged, painful and progress to bubo formation. Untreated buboes may spontaneously rupture and discharge frank pus.

**Treatment of chancroid:**
- Erythromycin 500 mg. orally, 4 times daily for 7 days
- Alternative regimen:
  - Azithromycin 1 gram orally, single dose
  - Ciprofloxacin 500 mg, twice daily for 3 days
  - Ulcerative lesions should be kept clean. Fluctuant lymph nodes should be aspirated.
  - In the presence of HIV co-infection the response to treatment of chancroid may be delayed and prolonged treatment may be necessary.

Donovanosis
Donovanosis is a chronic, slowly progressing ulcerative disease involving the skin, mucous membranes and lymphatics of the genitalia and perianal area. It is caused by an infection with Klebsiella granulomatis and the incubation period is about 3-6 weeks. The initial lesion is a small, non-painful papule that breaks down to form large, raised, beefy-red ulcers that become painful when secondarily infected. The ulcers bleed to the touch and are not accompanied by lymphadenopathy. Common sites are the prepuce, coronal sulcus and shaft of the penis in men and the vulva and perineal area in women. Extragenital lesions develop through autoinoculation.

**Treatment of donovanosis:**
- Doxycycline 100 mg. orally, twice daily for 14-21 days
- Alternative regimen:
  - Azithromycin 1 g. orally, on the first day, 500 mg. once daily for 14-21 days
  - Co-trimoxazole 480 mg. orally, 2 tablets twice daily for 14-21 days
  - Tetracycline 500 mg. orally, 4 times daily for 21 days
  - Erythromycin 500 mg. orally, 4 times daily for 21 days

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76 and 77. Necrotic ulcers of chanroid. The ulcers are very painful and have ragged edges.

78. Extragenital donovanosis on the chin.

79. Donovanosis ulcers.
Genital herpes
Genital herpes simplex lesions usually start as small vesicles that break down and form multiple shallow ulcerations. In primary genital herpes the patients complain of pain and itching. There may be dysuria and tender lymphadenopathy. The lesions can be found on the glans, prepuce and penile shaft in men and vulva, urethra and cervix in women. Resolution of these ulcerations occurs within 10-14 days. Recurrent genital herpes typically follows a milder course with fewer lesions, less extensive, and usually heals within a week of onset. However, when HIV co-infection is present, genital herpes may form large ulcers that do not heal spontaneously. Asymptomatic viral shedding occurs regularly and this is the predominant mode of transmission.

Treatment of genital herpes:
- Povidone iodine or potassium permanganate soaks and zinc oxide ointment control the secondary infection. Sometimes systemic antibiotics are needed. Antiviral therapy shortens the duration of the disease, but does not prevent the recurrences
- Give saline baths, and if the lesions are painful prescribe an analgesic. If the herpetic lesions are septic give Cotrimoxazole 480 mg orally, 2 tablets twice daily for 7 days.
- Acyclovir 200 mg orally, 5 times daily for 7 days
- Alternative regimen:
  - Valacyclovir 500 mg orally, twice daily for 7 days
  - Famciclovir 250 mg orally, three times daily for 7 days

Urethral discharge
Urethral discharge may be transparent fluid, whitish in colour or frank pus. It may be accompanied by dysuria and frequent micturition. Urethral discharge can be caused by Neisseria gonorrhoea, Chlamydia trachomatis, Trichomonas vaginalis, and less likely causes are Ureaplasma urealyticum, Mycoplasma hominis.

Treatment of urethral discharge
- Ciprofloxacin 500 mg, orally, single dose
  PLUS Doxycycline 100 mg., orally, twice daily for 7 days
Gonorrhoea
Gonorrhoea produces usually a profuse purulent discharge, white-yellow in colour and is usually associated with dysuria and frequency of micturition. The incubation period is usually in the order of 2-5 days. Gonorrhoea may produce an infection of the cervix, rectum, pharynx, and conjunctiva. Cervical infection is the most common site of infection in women. Up to one half of the women who are infected with Neisseria gonorrhoea may be asymptomatic.

Treatment of gonorrhoea:
- Ciprofloxacin 500 mg, orally, as a single dose
- Alternative regimen:
  - Ceftriaxone 250 mg, IM, as a single dose
  - Norfloxacin 800 mg, orally, as a single dose
  - Cefixime 400 mg, orally, as a single dose
  - Spectinomycin 2 g, IM, as a single dose

Chlamydia trachomatis
Chlamydia trachomatis infection produces a mild to moderate, watery, white or clear discharge, normally less profuse than gonorrhoea. The incubation period is about 7-21 days. It can also cause arthritis and infection of the conjunctiva of adults and newborns and pneumonitis in newborns. Up to 25% of men with urethral infections are asymptomatic, while in women up to 70% of the genital infections can be asymptomatic.

Treatment of Chlamydia trachomatis:
- Doxycycline 100 mg, orally, twice daily for 7 days
- Alternative regimen:
  - Azithromycin 1 g, orally, as a single dose

Trichomonas vaginalis
This urethritis produces a mild discharge that can be purulent, mucopurulent or mucoid. Dysuria or mild pruritus are the main complaints, although the majority of the infected men remain asymptomatic. Trichomonas vaginalis is normally acquired through sexual intercourse. In adult women the organisms are isolated from the vagina in over 95% of the infections, and from the urinary tract only in less than 5%. As many as one-half of infected women are asymptomatic. In symptomatic women, a vaginal discharge is the most common complaint. Only one-third of the men who are sexual partners of women with Trichomonas vaginalis infection are found to be infected themselves.

Treatment of Trichomonas vaginalis:
- Metronidazole 2 gr, orally, as a single dose
- Alternative regimen:
  - Metronidazole 400 mg, orally, three times daily for 5 days
**Vaginal discharge**

Vaginal discharge may be due to true vaginitis or cervicitis or sometimes due to urethritis or a combination of these. The clinical distinction between vaginitis and cervicitis is not always readily accomplished but has important prognostic implications. The complications of cervicitis such as endometritis, salpingitis and perihepatitis, can result in infertility and ectopic pregnancy, and are more severe than those of vaginitis. Women with vaginal discharge may be asymptomatic otherwise or on the other hand complain of dysuria, dyspareunia, abnormal odour, or vulvar itching. The vaginal discharge may be transparent fluid, whitish in colour; yellow, green, frothy discharge to frank pus, yellow-white in colour. Vaginitis can be due to infection with Trichomonas vaginalis, Candida albicans or Gardnerella vaginalis in conjunction with an infection with anaerobic bacteria. Vaginal discharge can be caused by Neisseria gonorrhoea, Chlamydia trachomatis, Trichomonas vaginalis, Candida albicans, Gardnerella vaginalis/anaerobic bacteria. Vaginal discharge may also be due to the intravaginal use of herbs or substances. Many women in Africa use these substances for hygienic measures or to enhance sexual pleasure, e.g. during ‘dry sex’.

**Treatment of vaginal discharge**

- Ciprofloxacin 500 mg, orally, single dose PLUS Doxycycline 100 mg twice daily for 7 days, PLUS Metronidazole 2 gr., orally, as a single dose or Metronidazole 400 mg, orally, three times daily for 5 days

**Gonorrhoea**

Gonorrhoea produces a profuse purulent vaginal discharge, white-yellow in colour and is associated with dysuria and frequency of micturition if the urethra is also infected. The endocervix is the primary site of gonococcal infection in women, and in infected women the urethra is colonized in 70-90%. The incubation period of gonococcal infection in women is usually in the order of 10 days.

Complications of infection with Neisseria gonorrhoea in women can be local, such as rectal infection, which occurs probably through direct spread of infected vaginal secretion, and Bartholin’s gland abscess. The infection may ascend into the reproductive tract causing salpingitis in an estimated 10-20% of those with acute gonococcal infection. Patients with gonococcal salpingitis usually present with lower abdominal pain, dyspareunia, abnormal menses, or intermenstrual bleeding.

**Treatment of gonorrhoea:**

- Ciprofloxacin 500 mg, orally, as a single dose
  - Alternative regimens:
    - Ceftriaxone 250 mg., IM., as a single dose
    - Norfloxacin 800 gr., orally, as a single dose
    - Cefixime 400 mg. orally, as a single dose
    - Spectinomycin 2 g. IM, as a single dose

**Chlamydia trachomatis**

Chlamydia trachomatis infection in women can be asymptomatic in up to 70% of cases. When the cervix or urethra has been infected, symptoms include dysuria, vaginal discharge, or vaginal pruritus. The incubation period of Chlamydia trachomatis infection is about 7-21 days.

Purulent infections of Bartholin’s ducts are due to Chlamydia trachomatis infection, either alone or with concurrent gonococcal infection. Sometimes the infectious organism ascends from the lower genital tract to the endometrium and Fallopian tubes, and salpingitis develops. The clinical manifestations are usually not specific. If peritoneal inflammation ensues it can result in hepatic capsular adhesions, which may produce the Fitz-Hugh-Curtis syndrome; that is pain, tenderness in the right upper quadrant of the abdomen, and occasionally a hepatic friction rub on auscultation.

**Treatment of Chlamydia trachomatis:**

- Doxycycline 100 mg., orally, twice daily for 7 days
  - Alternative regimen:
    - Azithromycin 1 g., orally, as a single dose
    - Alternative regimen in pregnant women:
      - Erythromycin 500 mg., orally, four times daily for 7 days
83. Bartholinitis with purulent secretion coming from the opening of the gland.

### Trichomoniasis

Another cause of vaginal discharge is infection with *Trichomonas vaginalis*. This organism causes infection of the vaginal epithelium, and produces a mild to profuse discharge, that is white or yellow-green, and has a frothy or foamy appearance. This is accompanied by a malodorous smell and pruritus. The epithelium of the vagina and introitus may be erythematous and irritated and occasionally pinpoint-bleeding spots can be observed on the cervix.

**Treatment of trichomoniasis:**
- Female: Metronidazole 2 gr., orally, as a single dose
- Alternative regimen:
  - Metronidazole 400 mg., orally, three times daily for 5 days
- Male: Metronidazole 400 mg., orally, three times daily for 5 days

### Candidiasis

*Candida albicans* infection is observed more commonly in pregnancy, during oral contraceptive use, when using antibiotics or corticosteroids, in diabetes mellitus and immunosuppression (for example HIV infection). The patient usually complains of vulvar pruritus and/or irritation, vaginal discharge or 'external' dysuria. On examination a scanty white discharge can be present which appears as clumped, cheesy plaques with erythema and erosions of the vaginal epithelium. Vulvar dermatitis may also be present together with excoriations as a sign of pruritus.

**Treatment of Candidiasis:**
- Nystatin 100,000 IU, intravaginal, daily for 14 days
- Alternative regimen:
  - Miconazole or Clotrimazole 200 mg., intravaginal, daily for three days
  - Clotrimazole 500 mg., intravaginal, as a single dose
  - Fluconazole 150 g., orally, as a single dose

84. Trichomoniasis with white, foamy discharge and inflamed vaginal epithelium.

85. Vaginal candidiasis

86. Bacterial vaginosis with greyish discharge without inflammation.
Bacterial vaginosis/anaerobic bacteria

Bacterial vaginosis is an infection of uncertain etiology, but often Gardnerella vaginalis and various anaerobic bacteria are implicated as causative organisms. These organisms replace the normal Gram-positive lactobacilli and cause a discharge that is usually malodorous. A white-grey homogeneous discharge is uniformly coated to the vaginal wall, with a sometimes-foamy appearance or is present at the introitus vulvae. It is not considered a STI, because it can develop and remit spontaneously irrespective of sexual activity.

Treatment of vaginosis:

- Metronidazole 400 mg., orally, three times daily for 5 days
- Alternative regimen:
  - Metronidazole 2 gr., orally, as a single dose
  - Metronidazole gel 0.75%, one full applicator (5 g) intravaginally, once daily for 5 days
  - Clindamycin cream 2%, one full applicator (5 g) intravaginally at bedtime for 7 days

NOTE: treatment of sexual partners has not been demonstrated to be of benefit in Bacterial vaginosis.

Lower abdominal pain in women

Lower abdominal pain in women is a common complaint and not always due to a sexually transmitted infection. Menstrual period pains, are usually distinguished from more serious causes of lower abdominal pain, on the basis of the history alone.

One major cause of lower abdominal pain in women is Pelvic Inflammatory Disease (PID). This term is used to describe upper genital tract infections that frequently involve the endometrium (endometritis), Fallopian tubes (salpingitis), and pelvic peritoneum (peritonitis). These infections result from ascending spread of lower genital tract infection. The most common organisms causing PID are Neisseria gonorrhoea, Chlamydia trachomatis, and several anaerobic bacteria. Salpingitis with subsequent scarring of the Fallopian tubes leads to ectopic pregnancy or infertility. A tubo-ovarian abscess may develop, as well as chronic abdominal pain, which is thought to be due to pelvic adhesions.

Symptoms of PID include:

Vaginal discharge, intermenstrual bleeding, abdominal pain (usually bilateral and in the lower quadrant), dyspareunia, dysuria, onset of pain in association with menses, fever, nausea and vomiting.

PID becomes highly probable if these findings are found together with:

- adnexal tenderness
- evidence of lower genital tract infection
- cervical motion tenderness

The IUD is a risk factor for the development of PID. In women with PID who also have an IUD as contraceptive device, the IUD should be removed, after initiation of antibiotic therapy for PID.
Lower abdominal pain in women can be caused by Neisseria gonorrhoea, Chlamydia trachomatis, anaerobic bacterial infection.

**Treatment of PID**
- Ciprofloxacin 500 mg OR norfloxacin 800mg orally, as a single dose
- OR ceftriaxone 250 mg IM OR spectinomycin 2 g IM
- PLUS doxycycline 100 mg., orally, twice daily for 14 days
- PLUS metronidazole 400 mg., orally, three times daily for 14 days.
  Alternative regimen for pregnant women:
  - Erythromycin 500 mg x 4 for 14 days

**Ophthalmia neonatorum**
Ophthalmia neonatorum is defined as a purulent discharge from, usually both eyes, in a neonate of less than one month of age.

Ophthalmia neonatorum can be caused by Neisseria gonorrhoea or Chlamydia trachomatis

**Treatment of ophthalmia neonatorum**
- Ceftriaxone 50 mg/kg. IM, as a single dose, to a maximum of 125 mg, or
- Kanamycin 25 mg/kg. body weight, IM. (maximum 75 mg.)*
- If no improvement after three days: Erythromycin syrup 50 mg/kg body weight daily, orally, in four divided doses for 14 days
- The instillation of tetracycline 1% eye ointment or silver nitrate 1% drops into the eyes is used to prevent ophthalmia but is not effective once a conjunctival infection and discharge is present.

**Bubo**
A bubo is a group of infected lymph nodes that form an inflammatory swelling, usually in the inguinal areas, that suppurates and progresses to frank abscess formation. If the abscess ruptures fistulas and sinus tracts are formed.

Bubo formation is seen in Lymphogranuloma venereum (LGV) and chancroid. When the bubo is caused by chancroid a genital ulcer is usually present. In contrast, if LGV causes the bubo formation an ulcer is usually absent.

The inguinal bubo of LGV has an incubation time of 10-30 days (sometimes 4-6 months), and is unilateral in two-third of the cases. Only one-third of inguinal buboes become fluctuant and rupture, while the others slowly involute and form firm inguinal masses. Women with LGV may complain of lower back pain when the deep pelvic and lumbar lymph nodes are involved or may develop proctocolitis complicated by perirectal abscesses, fistulas and strictures causing rectal stenosis.

Bubo formation can be caused by Chlamydia trachomatis, serotype L1, L2, L3, (LGV subtypes), and Haemophilus ducreyi.

**Treatment of bubo**
*without ulcer:* Doxycycline 100 mg, orally, twice daily for 14-21 days.
*with ulcer:* Ciprofloxacin 500 mg, twice daily for 3 days

Ulcerative lesions should be kept clean. Fluctuant lymph nodes should be aspirated.

**Scrotal swelling and epididymitis**
A scrotal swelling is defined as an acute or chronic swelling of the scrotal sack. The scrotum is often painful and red, and urethral discharge may be present.

A scrotal swelling is often caused by bacteria that also cause urethral discharge, i.e. Neisseria gonorrhoea and Chlamydia trachomatis. They mainly cause epididymitis. A urethral discharge may be present, but if absent, it does not exclude infection with Neisseria gonorrhoea or Chlamydia trachomatis. Other bacteria, Escherichia coli or Pseudomonas aeruginosa, may cause epididymitis, usually in persons above 35 years of age. The major complication of epididymitis, especially when recurrent, is infertility.

Scrotal swelling can be caused by Neisseria gonorrhoea, Chlamydia trachomatis, Escherichia coli, Pseudomonas aeruginosa, and less likely causes are mumps virus, testis carcinoma, tuberculosis, inguinal hernia.

Epididymitis and torsio testis are sometimes difficult to differentiate on clinical grounds. Here are some general characteristics that differentiate these two groups of patients:
Torsio testis
prepubertal children
history of previous scrotal pain
acute onset with rapid progression
testes elevated or rotated
no pus cells in the urine

Epididymitis
young adults who are sexually active
urethral discharge
slowly progressive swelling
swollen epididymis
pus cells in the urine

Treatment of scrotal swelling and epididymitis
- Ciprofloxacin 500 gr., OR Norfloxacin 800 gr orally, as a single dose OR
- Ceftriaxone 250mg IM
- PLUS Doxycycline 100 mg. orally, twice daily for 14 days
TORSIO TESTIS OR TESTIS CARCINOMA/INGUINAL HERNIA: Refer for surgical exploration

Condylomata acuminata
Condylomata acuminata (genital warts) are soft, often pedunculated growths, with a verrucous surface, that develop on the anogenital region. They are caused by different types of human papillomavirus. In women the most commonly affected areas are the labia minora, clitoris and walls of the vagina and cervix, but the infection may spread to the perineum and perianal region. In men the areas most likely to be involved are the glans, sulcus corona, frenulum, the subpreputial sac, and the urethral meatus. The lesions may be single or multiple, and range from flat to exophytic growth. Giant condylomata are a rare but potentially destructive growth that may become malignant.

Treatment of Condylomata acuminata:
- Podophyllin 20% in alcohol. Wash off after 4-6 hours. Contraindicated during pregnancy.
- Topical 5- Fluorouracil cream. Apply 1-7 times weekly depending on irritation it causes. Contraindicated during pregnancy.
- Cryotherapy with liquid nitrogen
- Electrodessication
- Imiquimod cream, 3-4 times weekly.
Unfortunately there is a high recurrence rate.

Pubic lice
Phthirus pubis (pubic louse or crab louse) causes infestation of the pubic and perianal regions, but in massive infections can also be found on the hairs of the legs, trunk, axillae and eyelashes. The infestation is usually contracted through sexual contact but it may be acquired from infected clothing or bedding. The itching sensation is usually severe and scratching may cause secondary bacterial infection. Close inspection of the genital region will reveal the firmly attached lice along with the nits, cemented to the pubic hairs.

Treatment of pubic lice
- Lindane 1% solution for 24 hours. Contraindicated during pregnancy and breastfeeding and in infants under 6 months of age.
- Permethrin 5% cream for 24 hours
- The undergarments and clothing should be washed.
- Infestation of the eyelashes may be treated with plain petrolatum applied twice daily, while manually removing the lice and the nits with a forceps.
Labotory examination

Syphilis
Serologic test can be divided in syphilis specific and non-specific tests. Non-specific tests, such as Venereal Research Laboratory Test (VDRL) and Rapid Plasma Reagin (RPR) are widely used, especially for screening purposes. The RPR test depends on the appearance of antibody in the serum. It may take three to five weeks after contracting the infection for this antibody to appear in the serum. Therefore, not all the cases of primary syphilis will give a positive result on the first examination. Biological false positive reactions may occur after viral infections (for example measles, chickenpox, herpes simplex and zoster) or in autoimmune diseases (for example lupus erythematosus and rheumatoid arthritis). Specific serologic tests are Treponema pallidum Particle Agglutination Assay, Treponema pallidum Hemagglutination Assay (TPHA), and Fluorescent Treponemal Antibody-absorption (FTA-ABS) showing the presence of specific antibodies. These tests are often used as confirmatory tests. They do not provide information about the stage of syphilis nor about the response to therapy.

Serologic tests for syphilis

<table>
<thead>
<tr>
<th>Stage of syphilis</th>
<th>Cardiolipin (VDRL, RPR)</th>
<th>TPHA</th>
<th>FTA-abs</th>
<th>IgM-FTA-abs/ELISA</th>
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Gonorrhoea
The primary site for specimen collection to detect N. gonorrhoea in women is the endocervical canal. If the opening of the cervix is covered with mucopurulent exudate this should be removed first by wiping it with cotton wool. A cotton swab should be inserted into the cervical canal and rotated for about 5-10 seconds to permit absorption of the exudate. In men the foreskin is retracted and the glans and urethra are cleaned with cotton wool. The discharge should come from the urethra and if not present the urethra should be “milked” in order to obtain a proper specimen. The swab is then rolled or smeared over the slide that is air-dried. The smear is fixed by passing it rapidly through a flame three times.

The specimen is Gram stained and examined under the oil immersion objective of the microscope. A typical picture shows intracellular Gram negative diplococci within white blood cells.

91. Pubic lice affecting the eyelashes.
Methylene blue staining is easy and quicker: The specimen is collected and fixed as described above, stained with methylene blue for 15-20 sec., rinsed with water and examined under oil immersion.

If the smear is taken for culture of Neisseria gonorrhoea the procedure as described above is more or less the same with the exception that the cotton wool tipped swab is sterile and will be placed into a special transport medium. After delivery to the laboratory the specimen will be inoculated onto culture plates for further growth. When Neisseria gonorrhoea is grown on culture antibiotic resistance can be detected.

**Trichomonas vaginalis**

For the detection of Trichomonas vaginalis in females, specimen should be collected from the posterior vaginal wall with a cotton-tipped swab. The slide is examined directly by microscope, after adding a drop of normal saline and the characteristic jerky movement can be observed. For the detection in males, 20 ml. of the first voided urine should be collected. After centrifugation the sediment is examined microscopically. On the other hand it is also possible to take a smear exactly the same way as the smear for N. gonorrhoea, but now the slide is examined directly by microscope, after adding a drop of normal saline.

**Candida albicans**

A specimen of vaginal fluid is obtained on a cotton-tipped swab. In men a swab premoistened in saline is used to rub the glans or the shaft of the penis. The swab is rolled onto a slide and 10% Potassium hydroxide or if this is not available normal saline is added. The typical morphology of budding yeasts or pseudohyphae may be observed.

**Bacterial vaginosis**

A vaginal specimen is obtained on a cotton-tipped swab and rolled onto a slide. A drop of Potassium hydroxide 10% is added and the slide is placed close to the nose to detect the characteristic amine (fishy) odor. The specimen is mixed with normal saline and examined microscopically to detect clue cells (squamous epithelial cells covered with small coccobicarylary organisms). On Gram stain the normal vaginal flora consists of large Gram-positive rods (Lactobacillus) mixed with vaginal squamous epithelial cells. The presence of clue cells combined with mixed bacterial flora such as coryneform rods, Gram-positive cocci, small Gram-negative rods, and curved rods is consistent with Bacterial vaginosis.
Laboratory tests are used for diagnosis of HIV infection and for monitoring outcome of therapy. Tests detect either antibodies against HIV antigens or the viral antigens themselves. The most common screening test is the Enzyme-linked Immunosorbent Assay (ELISA) with a high sensitivity of more than 99.5% to detect antibodies. Western blot assay detects antibodies against specific viral antigens and this is often used as a confirmation of the previous test. HIV RNA can be found in infected serum samples using Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) or Nucleic Acid Sequence-based Amplification (NASBA). Simple, rapid HIV antibody tests have been developed that offer results within 1 to 2 hours rather than 1 week for ELISA tests. Apart from blood products HIV antibodies can also be detected in saliva. Continuous quality control measures for all these tests should be in place and used.

Initial HIV infection causes a tremendous destruction of CD4 receptor positive lymphocytes. The lower the CD4+ cell count is the more severe is the immunosuppression. During successful antiretroviral therapy the number of CD4+ cells will gradually increase and this is monitored regularly, e.g. every 3-6 months. Failure of CD4+ cells to increase raises suspicion of lack of compliance or viral resistance to therapy. If a CD4+ cell count cannot be performed, a total lymphocyte count may be used as another marker of disease activity. The total amount of HIV copies in the blood can also be studied through the detection of viral RNA and is called Viral Load test.
Addendum

HIV infection and AIDS

HIV is a human retrovirus that is transmitted by infected body fluids (for example blood, semen, cervical secretions). Most, if not all, of those infected with the virus are ultimately expected to develop AIDS. The progression from the initial HIV infection to AIDS may take several years. Recently, antiretroviral therapy (ART) has become available and is gradually introduced in Africa. ART is not a cure but it will improve the physical well being of patients as well as decrease the risk of developing tumors and opportunistic infections.

The main target of HIV, when it infects the human body, is the immune system. The immune system mounts defensive action against microorganisms that have been able to get past the skin or the mucous membranes and which can cause disease. The immune system, through B-lymphocytes, produces antibodies to neutralize microorganisms and activates special blood cells (T lymphocytes and macrophages) that work to kill and remove these organisms from the body. When the immune system is not functioning, as it should, the person is described as having an immunodeficiency.

HIV infects several types of cells in the body that are recognized because they all carry the same molecule, CD4, on their surface. HIV also infects special cells in the immune system, namely: lymphocytes (helper CD4+ T lymphocytes), and macrophages and monocytes. The CD4+ T lymphocytes are particularly crucial to the immune response system because they coordinate interaction between B-lymphocytes, T lymphocytes and phagocytic cells. When someone is infected with HIV, the host defense will try to destroy the virus. However HIV survives inside the cells, replicating slowly. Eventually many T cells are infected and destroyed. This slowly leads to a persistent, progressive and profound impairment of the immune system, making an individual susceptible to infections and conditions such as cancer.

Stages of HIV infection:

HIV infection progresses through several stages. It begins when an individual becomes infected with the virus. Within 3 to 8 weeks after infection, some (but not all) people develop an acute illness lasting 2 to 3 weeks with symptoms such as fever, rash, joint and muscle pain, swollen lymph glands, diarrhea and sore throat. Symptoms are usually mild and will eventually disappear completely. This self-limiting condition is known as an acute seroconversion illness. During this period the virus continuous to reproduce itself inside the body and the person’s immune system responds by developing antibodies to the virus. Unlike antibodies to most other microorganisms, these antibodies do not destroy the virus effectively.

The person may remain asymptomatic and feel and appear healthy for years, after this initial infection. During this asymptomatic period, the person remains infectious (that is able to transmit the virus to others via sexual, blood-borne and perinatal transmission) and, as the virus continues to replicate, progressive damage to the immune system results over time. If their blood is tested during this stage it will test positive for HIV antibodies. Some individuals will have persistently enlarged lymph nodes during the asymptomatic stage of HIV infection.

Many individuals eventually develop a variety of indicators of ill health due to HIV infection without developing AIDS-defining opportunistic infections or cancers. These symptoms include complaints such as oral thrush, diarrhoea, weight loss, low-grade intermittent fevers and night sweats, a variety of skin rashes, loss of energy etc. Various fungal infections or viral diseases (for example herpes zoster) may be seen and individuals feel chronically ill during this stage of HIV infection.

Eventually, individuals will have episodes of AIDS-specific opportunistic diseases, such as tuberculosis, oropharyngeal candidiasis, persistent genital ulcers or secondary cancers such as Kaposi’s sarcoma and undifferentiated B-cell lymphoma.

Several drugs may reduce the incidence of opportunistic infections in Africa. Cotrimoxazole 480-960 mg daily will protect against bacterial infections e.g. pneumonia or meningitis, malaria, Isospora diarrhoea, Toxoplasmosis and Pneumocystis carinii pneumonia. Isoniazid preventive therapy may reduce signs and symptoms of TB infection in patients with HIV infection. For both preventive regimen it is important to study precisely who should be treated, when to start, and how long it should be continued, especially in the context of ART.

ART is able to restore the immune function of patients and thus improve the clinical findings. A good example of this is Kaposi’s sarcoma, an AIDS-defining tumor that regresses within several months of starting ART. If Kaposi’s sarcoma does not regress after initiation of ART, failure of ART or lack of compliance has to be considered.

Remember: once a person is infected with HIV, the person is infectious (i.e. able to transmit the virus to other people) for life.

Antiretroviral therapy is usually started for WHO stage III and IV disease and with CD4 count of less than 200 cell/mm3. Opportunistic infections, such as TB and cryptococcosis are to be diagnosed and treated before ART is started. Fixed dose combinations of two NRTI and one NNRTI (e.g. stavudine, lamivudine, nevirapine) are at present the simplest and cheapest treatment regimen available.
Antiretroviral drugs for the treatment of HIV infection in adults and adolescents in resource-limited settings

Recommendations for a Public Health Approach (2005-2006 Revision)

Guidelines Development Group

When to start treatment

Clinical parameters:

- **WHO Clinical Stage IV Disease**: treat irrespective of laboratory parameters; or
- **WHO Stage III Disease**: consider treatment for all but guided by CD4 cell count where available (especially for tuberculosis), or
- **WHO Clinical Stage II Disease**: treat guided by CD4 cell count or where CD4 cell assays are not available, guided by total lymphocyte count TLC; or
- **WHO Clinical Stage I Disease**: only guided by CD4 cell count.

CD4 criteria for initiation of ART

<table>
<thead>
<tr>
<th>CD4 (cell/mm³)</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 200</td>
<td>Treat irrespective of clinical stage</td>
</tr>
<tr>
<td>200-350</td>
<td>Consider treatment, initiate before drop below 200 cell/mm³</td>
</tr>
<tr>
<td>&gt;350</td>
<td>Defer treatment in asymptomatic persons</td>
</tr>
</tbody>
</table>

Where TLC is used to guide decision values less than 1200 cells/mm³ suggest initiation of ART is indicated in symptomatic persons.

### ANTIRETROVIRAL DRUGS, DOSE AND POTENTIAL SIDE EFFECTS

<table>
<thead>
<tr>
<th>NRTIs</th>
<th>Adult dose</th>
<th>Potential side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zidovudine (AZT)</td>
<td>200 mg TID or 300 mg BID</td>
<td>Neutropenia, anemia, nausea, myopathy, headache</td>
</tr>
<tr>
<td>Stavudine (d4T)</td>
<td>&gt;60 kg 40 mg BID</td>
<td>Neuropathy, elevated liver enzymes, nausea, diarrhea, myalgia</td>
</tr>
<tr>
<td></td>
<td>&lt;60 kg 30 mg BID</td>
<td></td>
</tr>
<tr>
<td>Lamivudine (3TC)</td>
<td>150 mg BID</td>
<td>Skin rash, headache, diarrhoea, hair loss</td>
</tr>
<tr>
<td>Didanosine (ddI)</td>
<td>&gt;60 kg 200 mg BID</td>
<td>Pancreatitis, neuropathy, abdominal pain</td>
</tr>
<tr>
<td></td>
<td>&lt;60 kg 125 mg BID</td>
<td></td>
</tr>
<tr>
<td>Zalcitabine (ddc)</td>
<td>0.75 mg BID</td>
<td>Neuropathy, elevated liver enzymes, aphthous stomatitis, anemia</td>
</tr>
<tr>
<td>Abacavir (ABC)</td>
<td>300 mg BID</td>
<td>Skin rash, fever, respiratory symptoms, abdominal pain</td>
</tr>
<tr>
<td>Tenofovir (TDF)</td>
<td>300 mg OD</td>
<td>Nausea, diarrhoea, headache, skin rash</td>
</tr>
</tbody>
</table>

### NNRTIs

<table>
<thead>
<tr>
<th>NNRTIs</th>
<th>Adult dose</th>
<th>Potential side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nevirapine (NVP)</td>
<td>20 200 mg OD for two weeks then 200 mg BID</td>
<td>Serious skin reaction, liver damage</td>
</tr>
<tr>
<td>Efavirenz (EFV)</td>
<td>600 mg OD</td>
<td>Skin rash, vertigo, fatigue, psychic symptoms</td>
</tr>
<tr>
<td>Delavirdine</td>
<td>400 mg TID on empty stomach</td>
<td>Skin rash, fever, elevated liver enzymes</td>
</tr>
</tbody>
</table>

### PI

<table>
<thead>
<tr>
<th>PI</th>
<th>Adult dose</th>
<th>Potential side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saquinavir (SQV)</td>
<td>600 mg TID with fatty meal</td>
<td>Headache, nausea, diarrhea</td>
</tr>
<tr>
<td>Ritonavir</td>
<td>600 mg BID with food</td>
<td>Nausea, diarrhoea, taste disturbances, paresthesias,</td>
</tr>
<tr>
<td>Indinavir</td>
<td>800 mg TID with food</td>
<td>Nephrolithiasis, icterus fatigue, headache</td>
</tr>
<tr>
<td>Nelfinavir</td>
<td>750 mg TID</td>
<td>Mild diarrhoea</td>
</tr>
<tr>
<td>Lopinavir (LPV)</td>
<td>400 mg BID</td>
<td>Skin rash, nausea, diarrhoea, insomnia, headache, elevated liver enzymes</td>
</tr>
<tr>
<td>Atazanavir (ATV)</td>
<td>300 mg OD with food</td>
<td>Lipodystrophy, headache, neuropathy, abdominal pain, diarrhoea, nausea, icterus, insomnia</td>
</tr>
</tbody>
</table>
1st and 2nd Line ARV Regimens in Adults and Adolescents (2005-2006)

<table>
<thead>
<tr>
<th>1st Line Regimens</th>
<th>2nd Line Regimens</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RTI Component</strong></td>
<td><strong>PI Component</strong></td>
</tr>
<tr>
<td>(AZT or d4T) + (3TC or FTC) + (EFV or NVP)</td>
<td>ABC + ddl or ABC + TDF or TDF + AZT ± 3TC*</td>
</tr>
<tr>
<td>(AZT or d4T) + (3TC or FTC) + (EFV or NVP)</td>
<td>ATV/r or LPV/r or SQV/r</td>
</tr>
<tr>
<td>(AZT or d4T) + (3TC or FTC) + (EFV or NVP)</td>
<td>ddl + AZT ± 3TC* or TDF + AZT ± 3TC*</td>
</tr>
<tr>
<td>(AZT or d4T) + (3TC or FTC) + (ABC or TDF)</td>
<td>EFV or NVP ± ddl or EFV or NVP + 3TC*</td>
</tr>
</tbody>
</table>

* NVP or ATV in place without ddl. TDF cannot be used with uncoded ATV.
A 3TC can be considered to be maintained in 2nd line regimens to reduce the viral fitness.