Chapter 1
ANTI-INFECTIVES

1. ANTI-INFECTIVE DRUGS

1.1 ANTIBACTERIALS
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ANTI-INFECTIVE DRUG THERAPY:

Anti-infective (antimicrobial) drugs are used for the treatment and prophylaxis of infections. Nowadays, healthcare professionals are increasingly more presented with scenarios in which infecting microbes that are resistant to all but a handful of antimicrobials. Infections secondary to drug-resistant pathogens continue to present therapeutic challenges to clinicians. A number of the

historically most active antimicrobials have undergone widespread susceptibility diminution. Particularly problematic pathogens include gram-positive microbes such as *Staphylococcus aureus* and *Enterococcus* species; extended-spectrum, and metallobetalactamase-producing Enterobacteriaceae; and nonfermentative gram-negative species such as *Acinetobacter* species and *Pseudomonas aeruginosa*.

SELECTING AN ANTIMICROBIAL: Ideally, the selection should base on identification of the causative organism(s) and their susceptibility to antimicrobials (Definitive therapy). In practice, however, the choice often follows from clinical diagnosis defining as precisely as possible, the sites and nature of infection, responsible pathogen(s) and known sensitivity to drugs (Empiric therapy). Samples (blood, pus, urine, sputum, CSF, etc.) should be collected *before* starting any 'blind' antimicrobial therapy to confirm clinical diagnosis and drug sensitivity. Removing barriers such as draining an abscess, obstruction in urinary or respiratory tract, etc. is important to facilitate entry of antimicrobials to site(s) of infection.

Patients who receive Empiric antimicrobial therapy, to which the causative pathogen is resistant, suffer significantly. This underscores the importance of selecting an empiric antimicrobial that possesses activity against the range of suspected pathogens. One or more antimicrobials, suggested by knowledge of likely organism and its sensitivity pattern, is then judged by the drug's specificity, safety (risk-benefit ratio), kinetic considerations and cost effectiveness in respect to the patient factors to make the final choice. Factors related to patient include history of drug allergy, renal and hepatic function, susceptibility to infection (i.e. whether immunocompromised), severity of illness, ability to tolerate drugs, concomitant use of other drugs, ethnic origin, age and sex; and if female, whether pregnant or breast-feeding or taking oral contraceptives.

Choice of appropriate route of administration, dosage formulation, and duration of therapy will depend on ability to tolerate drugs orally, site, type and severity of infection and kinetic consideration of drugs. Life threatening infections often require intravenous therapy. Painful intramuscular injections should better be avoided in children. The dose of an antibacterial will vary on such factors such as age, weight, renal and hepatic functions and the severity of infection. Duration of therapy depends on nature of infection and the response to treatment. In most cases a 5-7 days course is sufficient, and should not be unduly prolonged as the drugs are costly, encourage resistance and may lead to side-effects. In certain infections like chronic, it is necessary to continue treatment for longer periods.

CHEMOPROPHYLAXIS: The basis of chemoprophylaxis is use of an antimicrobial agent in a healthy person to prevent infection but in practice it also includes suppression of existing infection. The main categories of chemoprophylaxis are: (i) prevention of infections like rheumatic fever, recurrent urinary tract infections, etc.; (ii) prevention of opportunistic infections like bacterial endocarditis after dentistry or peritonitis after bowel surgery; (iii) suppression of existing infection before overt diseases result e.g. tuberculosis, malaria, animal bites, trauma; and (iv) prevention of exacerbation of a chronic infection like bronchitis.

Chemoprophylaxis in surgery is justified when risk of infection is high (such as presence of large number of organisms in organs being operated or in colorectal and gynecological surgery); when risk of infection is low but consequence of infection could be disastrous (e.g. insertion of prosthetic joints or valves etc.); or when patient is immunocompromised and is especially susceptible to infection. Antimicrobials should be selected on the basis of the knowledge of the likely pathogens at the sites of surgery and their prevailing antimicrobial susceptibility.

Antimicrobials should preferably be given intravenously (IV) or intramuscularly (IM) at the beginning of surgery and for no more than 72 hours.

COMBINATION THERAPY: In most cases treatment with a single drug is sufficient. But in some special cases, two or more antimicrobials are indicated, for example: (i) to prevent development of resistance in tuberculosis or leprosy; (ii) to broaden antibacterial spectrum in case of mixed infection e.g. peritonitis; (iii) to obtain potentiation e.g. penicillin with gentamicin.

PREVENTION OF RESISTANCE DEVELOPMENT: Development of resistance may be limited by avoidance of indiscriminate use of antimicrobial drugs, appropriate selection of such drugs, constant monitoring of resistance pattern in community, and *restricting use of newer antimicrobial drugs* as long as currently used drugs are effective. A publicly sponsored antimicrobial policy should incorporate: prevention of indiscriminate use; appropriate combination to be used only when essential; sensitivity pattern to be monitored at the community level; Indiscriminate use of newer antimicrobial drugs to be restricted

1.1. ANTIBACTERIAL DRUGS

1.1.1. PENICILLINS

Penicillins are bactericidal beta lactam antibiotics and act, like all other beta lactam drugs, by inhibiting bacterial cell wall synthesis. After absorption they are widely distributed throughout the body except the central nervous system. Penetration through cerebrospinal fluid barrier is increased when meninges are inflamed. Penicillins excreted out in the urine by the process of active tubular secretion which can be inhibited by simultaneous administration of probenecid or carinamide.

Side-effects: Most important is the hypersensitivity reaction related to the basic penicillin structure which causes rashes and anaphylaxis that can be fatal. Around 10% of penicillin-sensitive patient are allergic to cephalosporins and other beta lactams. A rare and serious toxicity is encephalopathy due to cerebral irritation. This may result from excessively high concentrations of penicillin either due to high dose administration or in patients with renal impairment. Another problem of high dose penicillins or of normal doses given to the patients with renal failure is the electrolyte accumulation since most injectable penicillins contain either sodium or potassium.

Diarrhea occurs during oral penicillin therapy, commonly with broad-spectrum

penicillins which can also cause antibiotic associated colitis.

Cautions: Individuals who have experienced anaphylaxis, urticaria or rash after penicillin administration are at increased risk of immediate hypersensitivity to penicillin. They should not receive any penicillin or other beta lactam antibiotic. Patient allergic to one penicillin will be allergic to all the other members. Individuals who develop minor rashes or rash that appears more than 72 hours after administration are not considered to be allergic to penicillin and in these individuals penicillin should not be withheld when indicated.

1.1.1.1 NARROW SPECTRUM PENICILLINS

1.1.1.1.1 PENICILLINASE-SENSITIVE NARROW SPECTRUM PENICILLINS

1.1.1.1.2 PENICILLINASE-RESISTANT NARROW SPECTRUM PENICILLINS

1.1.1.1.1 PENICILLINASE-SENSITIVE NARROW SPECTRUM PENICILLINS

These penicillins are effective against non-betalactamase (penicillinase) producing streptococci, meningococci, enterococci, pneumococci, staphylococci, treponema pellidum, bacillus anthracis, clostridium species, actinomyces and other gram positive rods and non-betalactamase producing gram negative anaerobic organisms.

BENZYLPENICILLIN [ED]

(Penicillin G)

Indications: streptococcal pharyngitis, arthritis, meningitis, endocarditis; meningococcal diseases; pneumococcal pneumonia, meningitis; anthrax, syphilis, gonorrhea, actinomycosis, gas gangrene, carbuncle, to eliminate carrier state in diphtheria, with or without gentamicin for *listeria*; surgical prophylaxis in limb amputation; intrapartum prophylaxis against group B streptococcal infection; prophylaxis against recurrence of rheumatic fever and streptococcal infections

Cautions: *see notes above;* dose reduction in renal impairment, (estimated GFR 10–50 ml/min/1.73 m^2, use normal dose every 8–12 hours; estimated GFR less than 10 ml/min/1.73 m^2 use normal dose every 12 hours);

Contraindications: penicillin hypersensitivity

Interactions: *see Appendix-2*

Side-effects: urticaria, fever, joint pain, rashes, angioedema, serum sickness like reactions, neutropenia, hemolytic anemia and nephritis; diarrhea and antibiotic-associated colitis, neutropenia, thrombocytopenia, coagulation disorders and CNS toxicity including convulsions (especially with high doses or in severe renal impairment), paraesthesia is also reported; *see also side-effects under Penicillins*

Dose: *IM inj. or slow IV inj. or Infusion*: ADULT, 1.2 g daily in 4 divided doses, if necessary increase to 2.4 g daily or more according to severity of infections (***single dose over 1.2 g IV route only***); PREMATURE INFANT AND NEONATE, 50 mg/kg body weight daily in 2 divided doses; in meningococcal meningitis, 100 mg/kg daily in 2 divided doses; INFANT, 1-4 weeks, 75 mg/kg daily in 3 divided doses. CHILD, 1 month to 12-years, 100 mg/kg daily in 4 divided doses;
bacterial endocarditis, 7.2 g daily in 4-6 divided doses; *meningococcal meningitis*, 2.4 g every 4-6 hours; CHILD, 1 month to 12 years, 180-300 mg/kg daily in 4-6 divided doses; **IMPORTANT:** If meningococcal infection is suspected, general practitioners are advised to give a single injection of benzylpenicillin by intramuscular or intravenous injection before transporting the patient urgently to hospital; suitable dose is ADULT 1.2 g; CHILD, < 1 year, 300mg, 1-9 years 600 mg, 10 years and over as for adult; in penicillin allergy, cefotaxime (*see sec.1.1.2.)* may be an alternative;]

Prophylaxis in limb amputation (for protection against gas gangrene) 300–600mg every 6 hours for five days; in case of penicillin allergy, metronidazole 500 mg every 8 hours for 5 days.

Proprietary Preparation
Pen-G *(Opsonin),* Inj., 10 Lac, Tk.12.586/vial; 5Lac Tk.11.29/vial

BENZATHINE PENICILLIN [ED]

Benzathine penicillin has a very long duration of action (2-3 weeks). It is used to provide a prolonged coverage of penicillin in rheumatic fever and is especially suitable for the treatment of all stages of syphilis.

Indications: rheumatic fever, upper respiratory tract infections, gonococcal infections and syphilis

Contra-indications: penicillin hyper sensitivity

Interactions: *see Appendix -2*

Side-effects: *see side-effects under Penicillins*

Dose: *deep IM inj.* (in the buttock): rheumatic fever, ADULT, 600,000 units per week or 12,00,000 units monthly; CHILD, 3 lac to 6 lac units; *primary or secondary syphilis,* a total of 24 lac units (12 lac units in each buttock) once; larger doses and longer courses may be needed for late syphilis or neurosyphilis

Proprietary Preparations
Benzapen *(Square),* Inj., 12 Lac Units/Vial, Tk. 27.96/Amp.
G-Benzathine Penicillin *(Gonoshasthaya),* Inj., 12 Lac Units / Vial, Tk. 22.00/Amp.; Inj., 6 Lac Units/Vial, Tk. 15.00/Amp.

PHENOXYMETHYL PENICILLIN [ED]

(Penicillin V)

Indications: tonsillitis, otitis media, erysipelas; prophylaxis in rheumatic fever and pneumococcal infection
Cautions, Contraindications: *see under benzylpenicillin*

Interactions: *see Appendix -2*

Dose : *oral*: ADULT, 500mg every 6 hours; CHILD, up to 1 year 62.5 mg every 6 hours, 1-5 years 125 mg every 6 hours, 6-12 years 250 mg every 6 hours
Prophylaxis in rheumatic fever or pneumococcal infection, 250 mg twice daily; CHILD under 5 years 125 mg twice daily

Proprietary Preparations
Albipen-V *(Albion),* Susp., 125 mg/5 ml, Tk.18.35/50ml
Biopen VK *(Biopharma),* Susp., 125 mg/5 ml, Tk.18.28/50 ml; Tk. 28.91/100 ml; Tab. , 250 mg, Tk. 2.28/Tab.
G-Penicillin V*(Gonoshasthaya),* Susp., 125 mg/5 ml, Tk. 19.76/50 ml;Tab., 500 mg, Tk. 2.00/Tab.
Open *(Opsonin),* Tab., 250 mg, Tk. 1.71/Tab.**;** 500 mg, Tk. 3.45/Tab.
Opsocillin *(Opsonin),* Susp.,125 mg/5 ml, Tk.13.84/50ml
Oracyn-K *(Sanofi),* Susp.,125 mg/5 ml, Tk.18.41/50ml; Tab., 500 mg, Tk. 4.40/Tab. ; 250 mg, Tk. 2.26/Tab.
Penco-V *(Supreme),* Tab.,250 mg, Tk. 1.45/Tab.
Penvik *(Square),* Susp., 125 mg/5 ml, Tk.28.97/100ml; Tab., 250 mg, Tk. 2.29/Tab.;DS Tab., 500 mg, Tk.4.43/Tab.
Penvik Forte *(Square),* Susp., 250 mg/5 ml, Tk. 58.47/100 ml
Rycin-K *(Albion),* Tab., 250 mg, Tk. 1.54/Tab.

PROCAINE PENICILLIN [ED]

(Procaine benzylpenicillin)

Procaine penicillin is a salt of procaine and benzylpenicillin, which is poorly soluble in water. It is used as intramuscular (IM) depot injections, which provide therapeutic tissue concentrations of penicillin for up to 24 hours.
Indications: preferred choice for the treatment of yaws and syphilis; neurosyphilis requires special consideration, penicillin sensitive all other infections (*see under Benzylpenicillin*)
Caution, Contraindication and Side-effects: same as in Benzylpenicillin; Procaine penicillin NOT suitable for intravenous (IV) route

Dose: *IM inj.,* 300,000 units with 100,000 units of benzylpenicillin once every 12-24 hours;

Primary syphilis, *IM inj.,* procaine penicillin 900 mg with benzylpenicillin sodium 180 mg daily for 10 days (14 days for secondary or latent syphilis)

Proprietary Preparations
Combipen *(Acme),* Inj., 4 LacTk. 14.05/Vial; 8 Lac Tk. 13.55/Vial
Pronapen *(Renata),* Inj.,8 Lac Tk. 9.10/Vial; Inj., 4 Lac, Tk. 14.05/Vial
Propen *(Opsonin),* Inj., 8 LacTk. 7.55/Vial, Inj., 4 Lac Tk. 5.74/Vial

1.1.1.1.2 PENICILLINASE-RESISTANT NARROW SPECTRUM PENICILLINS

cloxacillin, dicloxacillin, flucloxacillin, nafcillin, oxacillin etc. comprise this group of penicillins that are resistant to inactivating activity of penicillinases and exhibit antibacterial spectrum, albeit *less potent*, similar to those of narrow-spectrum drugs. Antibacterial activity against betalactamases producing organisms also is achieved by combining enzyme inhibitors like clavulanic acid, tazobactam, sulbactam with penicillins not resistant to betalactamases.
As they are acid stable, they can be given orally as well as by injection. Flucloxacillin is better and well absorbed from the gut than cloxacillin. *Staphylococcus aureus* strains resistant to flucoxacillin have also arisen, and may be treated by vancomycin or by teicoplanin. Other alternatives may include **rifampicin** and **sodium fusidate.**

CLOXACILLIN [ED]

Indications: same as that of Flucloxacillin

Cautions: *see under Flucloxacillin.*

Contraindications: *see under Benzyl-penicillin*

Interactions: *see underBenzylpenicillin.*

Side-effects: *see under Benzylpenicillin.*

Dose: *oral:* 500 mg every 6 hours, at least 30 minutes before food; CHILD under 2 years, quarter of adult dose; 2-10 years, half of adult dose

By intramuscular injection, 250 mg every 4-6 hours; CHILD under 2 years quarter of adult dose; 2-10 years half of adult dose

By slow intravenous injection or by intravenous infusion, 500 mg over 3 to 4 minutes every 4 to 6 hours; CHILD under 2 years quarter of adult dose; 2-10 years half of adult dose

All systemic doses may be doubled in severe infections

Proprietary Preparations
A-Clox *(Acme),* Cap., 500 mg, Tk. 5.96/Cap.; Paed. drop, 125 mg/1.25 ml, Tk. 26.38/15 ml; Susp., 125mg/5ml, Tk. 44.83/100 ml; Inj., 500 mg/Vial, Tk. 24.35/Vial; 250 mg/Vial, Tk. 13.71/Vial
Ambeeclox *(Ambee),* Cap., 500 mg, Tk.5.96/Cap
Clobex *(Beximco),* Susp., 125 mg/5 ml, Tk.43.85/100ml; Cap. 500 mg, Tk. 5.96/Cap.
Cloxamet *(Medimet),* Cap., 500mg, Tk.5.75/Cap.
Cloxin *(Opsonin),* Susp. 125 mg/5 ml, Tk. 33.71/100ml; Cap. 500 mg, Tk. 4.44/Cap.;Inj., 500 mg/Vial, Tk.19.03/Vial
Cloxpen *(Drug int.),* Cap. 500 mg, Tk. 5/Cap.
Cyclox *(Sonear),* Cap., 500 mg, Tk. 5.96/Cap.
Ficlox *(Sanofi),* Cap., 500 mg, Tk. 6.76/Cap; Inj., 500mg/Vial, Tk. 25.39/Vial; Paed. drops, 125 mg/1.25ml, Tk. 27.25/15 ml, Susp. 125 mg/5 ml, Tk. 44.84/100 ml
G-Cloxacillin *(Gonoshasthaya),* Susp., 125 mg/5 ml, Tk. 42.25/100 ml;Cap., 500 mg, Tk. 4.50/Cap.;Inj, 500 mg/Vial, Tk. 20/Vial
Hi-clox *(Hudson),* Cap., 500mg, Tk.5.00/Cap.; Susp., 125mg/5ml, Tk.42.00/100 ml
Loxa *(Albion),* Susp., 125 mg/5 ml, Tk. 43.00/100 ml; Cap. 500 mg, Tk. 5.94/Cap.
Navaclo *(Navana),* Cap., 500 mg, Tk. 6.76/Cap.; Susp.,125 mg/5 ml, Tk. 43.20/100ml
Penclox *(Central),* Susp., 125 mg/5 ml, Tk. 43.00/100ml; Cap. 500 mg, Tk. 5.80/Cap.
Sinaclox *(Ibn Sina),* Susp., 125 mg/5 ml, Tk. 43.00/100ml; Cap. 500 mg, Tk. 5.75/Cap.

DICLOXACILLIN

Indications: treatment of staphylococcal infection resistant to benzylpenicillin

Side-effect and Cautions: same as that of flucloxacillin

Dose: 125 to 250 mg every 6 hours, CHILD: 12.5 to 25mg/kg daily in divided doses. Doses may be increased in severe infections Dicloxacillin sodium has also been given parenterally

Generic Preparation
Capsule, 500mg; 250mg

FLUCLOXACILLIN

Indications: beta-lactamase-producing staphylococci infections including otitis externa; adjunct in pneumonia, impetigo, cellulitis, osteomyelitis and in staphylococcal endocarditis

Cautions: ***s****ee under Benzylpenicillin*

Cholestatic Jaundice may occur up to several weeks after treatment with flucloxacillin; in that case treatment with flucloxacillin should be stopped.

Contraindications: *see under Benzyl-penicillin*

Side-effects: *see under Benzyl-penicillin;* also hepatitis and cholestatic jaundice reported

Dose: *by mouth*, 250–500 mg every 6 hours, at least 30 minutes before food; CHILD under 2 years, quarter of adult dose; 2-10 years, half of adult dose

By intramuscular injection, 250-500 mg every 6 hours; CHILD under 2 years quarter adult dose; 2-10 years half of adult dose
By slow intravenous injection or by intravenous infusion, 0.25-1 g every 6 hours; doses may be doubled in severe infections. CHILD: under 2 years 1/4th the adult dose; 2-10 years 1/2 of adult dose
Endocarditis: 12 g daily in 6 divided doses for 4 weeks
Osteomyelitis: up to 8 g daily in 3-4 divided doses

Proprietary Preparations
A-Flox *(Acme),* Cap., 250 mg, Tk. 5.64/Cap. 500 mg, Tk. 10.55/Cap. ; Inj., 250 mg/vial, Tk. 35.14/vial; 500 mg/vial, Tk. 45.17/vial; Susp., 125 mg/5 ml, Tk. 61.42/100 ml
Alfux *(Albion),* Cap., 250 mg, Tk. 5.75/Cap.; 500 mg, Tk. 10.00/Cap.; DS Susp., 125 mg/5 ml, Tk. 60/100ml
Belox *(Benham),* Cap., 250 mg , Tk. 5.50/Cap.; 500mg, Tk.10.00/Cap.; Susp.,125 mg/5ml, Tk. 60/100ml
Capflu *(Alco),* Cap., 250 mg, Tk. 5.00/Cap.; Cap., 500 mg, Tk. 10.00/Cap. ; Susp., 250 mg/5 ml, Tk. 110.00/100 ml
Cloxafu *(Sonear),* Cap., 500 mg, Tk. 10.25/Cap,; 250 mg, Tk. 5.64/Cap.
Clox-F *(Asiatic),* Cap., 250 mg, Tk. 5.00/Cap.; 500 mg, Tk.10.00/Cap.; Susp., 250 mg/5 ml, Tk. 110.00/100 ml; Susp., 125 mg/5 ml, Tk. 60.00/100 ml
Dolopen *(Techno),* Cap., 250 mg, Tk. 4.75/Cap.; Cap., 500 mg, Tk. 10.53/Cap.; Inj., 250 mg/vial , Tk. 30.00/Vial; 500 mg/Vial , Tk. 45.00/Vial, DS Susp., 125 mg/5 ml, Tk. 60.00/100 ml
Eflucin *(Jayson),* Cap., 250 mg, Tk. 5.77/Cap.; 500 mg, Tk. 10.03/Cap.; Inj., Tk. 35.13/Vial
Filux *(Opsonin),* Cap., 500 mg, Tk. 7.92/Cap.
Floxapen *(General),* Cap., 250 mg, Tk. 5.77/Cap.; 500mg, Tk. 10.54/Cap.; Susp., 125 mg/5 ml, Tk. 61.23/100 ml
Floxason *(Hudson),* Suspn., 125mg/5ml, Tk.60.00/100 ml; Cap., 250mg, Tk.5.00/Cap.; 500mg, Tk.10.00/Cap.
Flubac *(Popular),* Susp., 125 mg/5 ml, Tk. 61.23/100ml; 150 mg/5 ml, Tk. 110.42/60 ml Cap., 250mg, Tk. 5.77/Cap.;500 mg, Tk. 10.04/Cap.
Flubex *(Beximco),* Cap., 250 mg, Tk. 5.50/Cap.; 500mg, Tk. 10.50/Cap.; Susp., 125 mg/5 ml, Tk. 60.00/100ml**;** 250 mg/5 ml, Tk. 110.00/100 ml
Flubiotic *(Navana),* Cap., 250 mg, Tk. 5.52/Cap.; 500mg, Tk. 10.04/Cap.;Susp., 125 mg/5 ml, Tk. 60.23/100 ml
Fluc *(Astra),* Susp., 125 mg/5 ml, Tk. 60.00/100 ml Cap., 500 mg, Tk. 0.00/Cap.
Flucillin *(Medimet),* Susp., 125mg/5ml, Tk.60.00/100ml; Cap., 500mg, Tk10.00/Cap.; 250mg, Tk.5.50/Cap.
Fluclox *(ACI),* Susp., 125 mg/5 ml Tk. 61.23/100 ml ; 250 mg/5 ml, Tk. 110.41/100 ml; Cap., 250 mg, Tk. 5.77/Cap.; 500 mg, Tk. 10.50/Cap.; Inj., 250 mg/Vial, Tk. 35.13/Vial ; 500 mg/Vial, Tk. 45.14/Vial
Flucloxin *(Eskayef),* Susp., 125 mg/5 ml, Tk. 61.00/100 ml; Cap., 250 mg, Tk. 5.56/Cap.; 500 mg, Tk.10.50/Cap.
Flucopen *(Somatec),* Cap., 250 mg, Tk. 5.53/Cap.; Cap., 500 mg, Tk.10.03/Cap.; Susp., 125 mg/5 ml, Tk.60.23/100 ml
Flu-K *(Kemiko),* Susp., 125 mg/5 ml, Tk. 60.00/100 ml; Cap., 250 mg, Tk. 5.63/Cap.; 500 mg, Tk. 10.50/Cap.

Flukin *(Pharmasia),* Susp.,125 mg/5 ml, Tk. 60/100ml; Cap., 250 mg, Tk. 5.52/Cap.; 500 mg, Tk. 10.50/Cap.
Flupen *(Drug Int),* Cap., 500 mg, Tk. 10.50/Cap.; 250mg, Tk. 5.00/Cap. Susp., 125 mg/5 ml, Tk. 60.00/100 ml
Flurif *(Sharif),* Cap., 500 mg, Tk. 10.50/Cap.
Flustar *(Renata),* Cap., 250 mg, Tk. 5.50/Cap.; 500mg, Tk. 10.00/Cap.
Flusyrup *(Alco),* Susp.,125 mg/5 ml, Tk. 60.00/100 ml
Flutam *(Leon),* Susp., 250 mg/5 ml, Tk.110.00/100 ml; Cap., 250 mg, Tk. 5.70/Cap.; 500 mg, Tk.10.50/Cap.
Flutec *(APC),* Cap., 250 mg, Tk. 5.75/Cap. ; DS Cap., 500 mg, Tk. 10.00/Cap.
Susp., 125 mg/5 ml, Tk. 60.00/100 ml
Flux *(Opsonin),* Cap., 250 mg, Tk. 4.34/Cap.; Inj. 500mg/vial, Tk. 33.96/Vial; DS Susp., 250 mg/5 ml, Tk.83.02/100 ml; 125 mg/5 ml, Tk. 46.04/100 ml
Fluxi *(Ziska),* Susp., 125mg/5ml, Tk. 60.00/100ml ; Cap., 250mg, Tk. 4.60/Cap.; 500mg, Tk. 10.00/Cap.
Fluxin *(Ambee)* , Suspn. , 125 mg / 5ml , Tk.58.88 /100ml; Cap., 250 mg , Tk. 5.59/ Cap; 500 mg , Tk. 10.04/Cap
G-Flucloxacillin *(Gonoshasthaya),* Cap., 500 mg, Tk.7.00/Cap.; Inj., 500 mg/vial, Tk.25.00/Vial ; Susp., 125 mg/5 ml, Tk. 56.00/100 ml
Halopen *(Nipro JMI),* Susp., 125 mg/5 ml, Tk.60.23/100 ml; Cap., 250 mg, Tk. 5.53/Cap.; 500 mg, Tk.10.00/Cap.
Inclox *(Incepta),* Cap., 250 mg, Tk. 5.50/Cap.; 500 mg, Tk.10.00/Cap.
Isoclox *(Globe),* Susp., 125 mg /5 ml, Tk. 60.00/100 ml; Cap., 500 mg, Tk. 10.00/Cap.; 250 mg , Tk. 5.50/Cap.
Isoflu *(Central),* Cap., 500 mg, Tk.10.00/Cap.; Susp., 125 mg/5 ml, Tk. 60.00/100 ml
Luf *(Apex),* Susp., 125 mg/5 ml, Tk. 60.00/100 ml; Cap., 250 mg, Tk. 5.50/Cap.; 500 mg, Tk. 10.00/Cap.
Makflucin *(Maks),* Cap., 250 mg, Tk.10.00/Cap. ; Cap., 500 mg, Tk. 20.00/Cap.
Monaclox-F *(Amico),* Susp.., 125 mg/5 ml, Tk. 65.00/100 ml; 250 mg/5 ml, Tk. 100.00/100 ml ;Cap., 250 mg, Tk. 5.50/Cap.; 500 mg, Tk. 10.00/Cap.
Orgaflu *(Organic),* Cap., 250 mg, Tk. 5.56/Cap.; 500mg, Tk.10.50/Cap.
Oxacol *(Ad-din),* Cap., 500mg, Tk. 9.00/Cap.
Perpen *(Rangs),* Susp., 125 mg / 5 ml , Tk. 60.00/100 ml ; Cap., 250mg, Tk. 5.50/Cap.; 500mg, Tk. 10.5 /Cap.
Phylopen *(Square),* Cap., 250 mg, Tk. 5.52/Cap. Susp., 125 mg/5 m Susp., 250 mg/5 ml, Tk. 110.41/100ml; Tk. 60.22/100 ml; Inj., 500 mg/Vial, Tk.45.16/Vial ;DS Cap., 500 mg, Tk. 10.54/Cap.
Revistar *(Biopharma),* Cap., 250 mg, Tk. 5.52/Cap.; 500 mg, Tk. 10.04/Cap.; Susp., 125 mg/5 ml, Tk.60.23/100 ml
Sinaflox *(Ibn Sina),* Cap., 250 mg, Tk. 5.60/Cap.; 500 mg, Tk. 10.50/Cap.; Susp., 125 mg/5 ml, Tk.65.00/100 ml
Skilox *(Healthcare),* Cap., 250 mg, Tk. 275/Cap.; 500 mg, Tk. 10.00/Cap.; DS Cap., 100 mg, Tk. 60.00/Cap.
Softapen *(Rephco),* Cap., 250 mg, Tk. 5.50/Cap.; 500mg,Tk.11.00/Cap.; Susp.,125 mg/5 ml,Tk.70/100 ml
Stafoxin *(Aristo),* Susp., 125 mg/5 ml, Tk. 60.00/100ml; Cap., 250 mg, Tk. 5.50/Cap.; 500 mg, Tk. 10.00/Cap.
Stapkil *(Pacific),* Cap., 250 mg, Tk. 4.14/Cap.; 500 mg, Tk.7.52/Cap.; Susp.,125 mg/5 ml, Tk. 34.59/100 ml
Syflu *(MST),* Susp., 125 mg/5 ml,, Tk. 61/100 ml; Cap., 500 mg, Tk. 1.00 /Cap.

1.1.1.2 BROAD SPECTRUM PENICILLINS

1.1.1.2.1 PENICILLINASE-SENSITIVE BROAD SPECTRUM PENICILLINS
1.1.1.2.2 PENICILLINASE-RESISTANT BROAD SPECTRUM PENICILLINS

Broad-spectrum penicillins (**ampicillin**, **amoxicillin, bacampicillin**) retain the antibacterial activity of narrow spectrum with additional bactericidal activity against *E. coli, H. influenzae, Salmonella* species, *Listeria monocytogenes* and *Helicobacter pylori*.

1.1.1.2.1 PENICILLINASE-SENSITIVE BROAD SPECTRUM PENICILLINS

These drugs are subjected to the destruction by the penicillinase produced by organisms and are not effective against infections there of.
Ampicillin is particularly valuable for the treatment of respiratory tract infections (RTI) by mixed organisms that include *Haemophilus influenzae*. It is recommended nowadays, with less enthusiasm than it was before. It should not be used for the hospital patients without checking the sensitivity. Ampicillin is well excreted in the bile and urine. It can be given oral: but less than

½ the dose is absorbed which is further decreased by the presence of food in the gut. Maculopapular rashes commonly appear with ampicillin and amoxicillin but not related to penicillin allergy. They almost always occur in patients with glandular fever. These antibiotics should not be used for 'blind' treatment of a sore throat.

Amoxicillin It is a derivative of ampicillin and has the same antibacterial spectrum. Orally given it is better absorbed than ampicillin and produces higher plasma and tissue concentrations. Besides, its absorption is not affected by the presence of food in the stomach.

AMOXICILLIN[ED]

(Amoxycillin)

Indications: *as under Ampicillin;* also endocarditis prophylaxis, meningococcal disease and adjunct in listeria meningitis

Cautions, Contra-indications, Side-effects: *see under Ampicillin.*

Dose: *oral:* ADULT 250 mg every 8 hours, doubled in severe infections; CHILD up to 10 years, 125 mg every 8 hours, doubled in severe infections
Severe or recurrent purulent respiratory infection, 3 g every 12 hours
Short course oral therapy

Dental abscess, 3 g repeated after 8 hours. UTI 3 g repeated after 10-12 hours. Otitis media: CHILD 3-10 years, 750 mg twice daily for two days

IM inj.: 500 mg every 8 hours; CHILD, 50-100 mg/kg daily in divided doses

IV inj. or infusion; 500 mg every 8 hours increased to 1 g every 6 hours; CHILD, 50-100 mg/kg daily in divided doses

Meningitis (if necessary, in combination with another antibiotic), *by IV infusion*, 2g every 4 hours for 5 days in meningococcal disease or for 10-14 days in listerial meningitis

Proprietary Preparations

Ambeexin *(Ambee),* Paed. drop,125ml / 10.25ml,Tk 28.42/ 15 ml; Susp., 125 mg/5ml Tk 46.55/ 100ml; Cap. 250 mg, Tk. 3.55/Cap,

Amocap *(Sonear),* Cap., 250 mg, Tk. 3.59/Cap.; 500 mg, Tk.6.15/Cap.
Amocil *(MST),* Susp., 2.5 gm/100 ml, TK. 50 / 100 ml; Cap., 500 mg, Tk. 6/Cap.
Amocin *(Pacific),* Cap., 250 mg, Tk. 2.48/Cap.; 500 mg, Tk.5.04/Cap.; Susp., 125mg/5ml, Tk.30.08/100 ml
Amotid *(Biopharma),* Cap., 250 mg, Tk.3.61/Cap.; 500 mg, Tk.6.02/Cap.; Paed. drops, 125 mg/1.25 ml, Tk. 30.11/15 ml; Susp., 125 mg/5ml, Tk.46.17/100 ml; 250 mg/5ml, Tk.65.25/100 ml
Amoxon *(Jayson),* Cap., 250 mg, Tk. 3.61/Cap.; 500 mg, Tk. 6.76/Cap.; Inj., 500 mg/Vial, Tk. 24.59/Vial; Susp., 125 mg/5ml, Tk. 47.47/100 ml
Amx *(Nipro JMI),* Cap., 250mg, Tk. 3.60/Cap.; 500mg, Tk. 6.76/Cap.; Susp., 125mg/5ml, Tk. 47.47/100 ml
Antif *(Rangs),* Cap., 500 mg, Tk. 6.75/Cap.; Susp., 250mg/5ml, Tk. 65/100 ml ;Paed. drops, 125mg/1.25ml , Tk. 30.00/15 ml; Susp., 125mg/5ml Tk. 47.45/100 ml; Cap., 250 mg, Tk. 3.61/Cap.
Apoxy *(Apex),* Cap., 500 mg, Tk. 5.50/Cap.; Susp., 125 mg/5 ml, Tk.47.47/100 ml
Aristomox *(Aristo),* Cap., 250mg, Tk. 3.50/Cap.; Cap., 500mg, Tk.6.00/Cap.; Susp., 125mg/5ml, Tk.45.00/100 ml
Avlomox *(ACI),* Cap., 250mg, Tk. 3.45/Cap.; 500mg, Tk. 6.10/Cap.; Inj. 250mg/Vial, Tk. 18.00/Vial; 500mg/Vial, Tk. 32.00/Vial Paed. drop, 125mg/1.25ml, Tk. 30.20/15 ml; Susp., 125mg/5ml, Tk. 46.00/100 ml; 250mg/5ml, Tk. 65.25/100 ml
Bactamox *(Renata),* Paed. drop, 125 mg/1.25 ml, Tk. 28.32/15 ml; Susp., 125 mg/5 ml, Tk. 45.52/100 ml**;**Tab. 250 mg, Tk. 3.38/Tab.; Tab. 500 mg, Tk. 5.81/Tab.
Benoxil *(Benham),* Cap., 250 mg, Tk. 2.17/Cap.; 500 mg, Tk. 5.50/Cap.; Paed. Drop, 125 mg/1.25 ml, Tk. 27.00/15 ml; Susp., 125 mg/5ml, Tk. 45.00/100 ml ; Susp., 250 mg/5 ml, Tk. 67.00/100 ml
Cemoxin *(Central),* Cap., 250 mg, Tk. 3.40/Cap.; 500 mg, Tk. 6.50/Cap.; Susp., 125 mg/5ml, Tk. 45.00/100 ml
Demoxil *(Drug Intl),* Cap., 250 mg, Tk. 3.50/Cap.; 500mg, Tk. 6.25/Cap.; Susp., 125 mg/5 ml, Tk. 47.00/100 ml; 250 mg/5 ml, Tk. 65.00/100 ml
Fimox *(Popular),* Cap., 250mg, Tk. 3.61/Cap.; 500mg, Tk. 6.76/Cap.; Paed. drop, 125mg/1.25ml, Tk. 30.19/15ml; Susp., 125mg/5ml, Tk.47.46/100 ml; 250 mg/5ml, Tk. 68.26/100ml
Fimoxyl *(Sanofi),* Cap., 250mg, Tk. 3.61/Cap.; 500mg, Tk. 6.76/Cap.; Inj., 250mg/Vial, Tk. 19.19/Vial; 500mg/Vial, Tk. 26.29/Vial; Paed. drop, 125mg/1.25ml, Tk. 30.20/15ml; Susp., 125mg/5ml, Tk. 47.46/100ml; 250mg/5ml, Tk.

68.26/100ml; Tab., 250 mg, Tk. 3.48/Tab.; 500mg, Tk. 6.02/Tab.
G-Amoxicillin *(Gonoshasthaya),* Cap., 250 mg, Tk. 2.75/Cap.; 500 mg, TK. 6.00/Tab.; Inj., 500 mg/Vial, Tk. 24.80/Vial; Paed. drops, 125 mg/1.25 ml, Tk. 24.00/15 ml; Susp., 125 mg/5 ml, Tk. 40.00/100 ml
Genamox *(General),* Cap., 250 mg, Tk. 3.61/Cap.; 500 mg, Tk. 6.76/Cap.; Paed. drops, 125 mg/1.25 ml, Tk. 30.11/15 ml; Susp., 125 mg/5 ml, Tk. 47.45/100 ml
Hiconcil *(Medimet),* Paed. drop, 125mg/1.25ml, Tk.27.00/15ml; Cap., 250mg, Tk.3.45/Cap.; 500mg, Tk.6.00/Cap.
DS Susp., 125mg/5ml, Tk.47.00/100ml
Hi-mox *(Hudson),* Cap., 250mg, Tk.3.50/Cap.; Susp, 125mg/5ml, Tk.47.00/100 ml; DS Cap., 500mg, Tk.6.00/Cap.
J-mox *(Ad-din),*Paed. drop, 125mg/1.25ml, Tk. 28.32/15 ml; Susp., 125mg/5ml, Tk. 45.00/100 ml; Cap., 250mg, Tk. 2.86/Cap.; 500mg, Tk. 5.71/Cap.
Kamoxy *(Kemiko),* Cap., 250 mg, Tk. 3.60/Cap.; 500 mg, Tk. 6.76/Cap.; Paed. drops, 125 mg/1.25 ml, Tk. 28.00/15 ml, Susp., 125 mg/5 ml, Tk. 47.46/100 ml
Loxyl *(Asiatic),* Cap., 250 mg, Tk. 3.61/Cap.; 500 mg, Tk. 6.76/Cap.; Susp., 125 mg/5 ml, Tk. 47.46/100 ml
Makcil *(Maks),* Cap., 250 mg, Tk. 3.55/Cap.; 500 mg, Tk. 6.05/Cap.; Susp., 125 mg/5 ml, Tk. 45.00/100 ml
Mimox *(Albion),* Cap. , 250 mg, Tk. 3.38/Cap.; 500 mg, Tk. 5.81/Cap.; Paed. drops, 125 mg/1.25 ml, Tk. 28.00/15ml; Susp., 125 mg/5 ml, Tk. 46.00/100ml; Tab., 250 mg, Tk. 3.38/Tab.; 500 mg, Tk. 6.00/Tab.
Monamox *(Amico),* Cap., 250 mg, Tk. 3.00/Cap.; 500 mg, Tk. 6.00/Cap.; Susp., 125 mg/5 ml, Tk. 47.40/100 ml; 250 mg/5 ml, Tk. 60.00/100 ml; Paed. drops, 125 mg/1.25 ml, Tk. 28.00/15 ml
Mox *(Astra),* Cap., 500 mg, Tk.6.00/Cap.
Moxacil *(Square),* Cap., 250 mg, Tk. 3.61/Cap.; 500 mg, Tk. 6.77/Cap.; Inj., 500 mg/vial, Tk. 25.22/Vial; Paed. drops, 125 mg/1.25 ml, Tk. 30.11/15 ml; Susp., 125 mg/5 ml, Tk. 47.47/100 ml; 250 mg/5 ml, Tk. 65.25/100 ml; Tab., 250 mg, Tk. 3.49/Tab.; 875 mg, Tk. 10.04/Tab.
Moxarif *(Sharif),* Cap., 500 mg, Tk. 6.00/Cap.
Moxico *(Supreme),* Cap., 250mg, Tk. 3.60/Cap.; 500mg, Tk. 6.00/Cap.; Susp., 125mg/5ml, Tk. 47.00/100 ml; 250mg/5ml, Tk. 65.00/100 ml
Moxilin *(Acme),* Cap., 250 mg, Tk. 3.62; 500 mg, Tk. 6.75/Tab.; Inj., 250 mg/Vial, Tk. 21.20/Vial; Inj., 500 mg/Vial, Tk. 33.60/Vial; Paed. drop, 125 mg/1.25 ml, Tk.30.19/15 ml; Susp., 125mg/5 ml, Tk. 47.46/100 ml; 250mg/5 ml, Tk. 68.25/100 ml
Moxin *(Opsonin),* Cap., Tk. 5.07/Cap.; Susp., 125 mg/5 ml, Tk. 35.69/100 ml; 250 mg/5 ml, Tk. 58.57/100 ml; Tab., 250 mg, Tk. 2.62/Tab.; 500mg, Tk. 8.75/Tab.; Inj., 250 mg/Vial, Tk. 14.34/Vial
Mox-plus *(Hudson),* Susp.,, 250mg/5ml, Tk.65.00/100 ml
Navamox *(Navana),* Cap., 250 mg, Tk. 3.51/Cap.; 500mg, Tk. 6.53/Cap.; Susp., 125 mg/5 ml, Tk. 47.00/100 ml
Orgamox *(Organic),* Cap., 250 mg, Tk. 3.54/Cap.; 500 mg,Tk.6.76/Cap.; Susp., 125 mg/5 ml, Tk. 47.00/100 ml
Pemox *(APC),* Cap., 250 mg, Tk. 3.00/Cap.; 500 mg, Tk. 6.00/Cap.; Paed. drops, 125 mg/1.25 ml, Tk. 28.00/15 ml; Susp., 125 mg/5 ml, Tk. 45.00/100 ml
Penmox *(Techno),* Cap. 500mg, Tk. 6.76/Cap.; Inj., 250mg/vial, Tk. 16.00/Vial; 500mg/vial, Tk. 22.50/Vial; Susp., 125 mg/5 ml, Tk. 47.00/100 ml
Remoxin *(Rephco),* Cap., 500mg, Tk. 6.50/Cap.; Susp.,125 mg/5 ml,Tk 46/100 ml
Sapox *(Alco),* Cap., 250mg, Tk. 3.44/Cap.; 500mg, Tk. 6.77/Cap; Paed. drop, Tk. 30.20/15 ml; Susp., 125mg/5ml, Tk. 47.47/100ml; 250mg/5ml, Tk.69/100 ml
Sinamox *(Ibn Sina),* Cap., 250mg, Tk. 3.60/Cap.; 500mg, Tk. 6.75/Cap.; Paed. drops, 125mg/1.25ml, Tk. 30.00/15 ml; Susp., 125mg/5ml, Tk. 47.46/100 ml; 250mg/5ml, Tk.69.00/100 ml
Sk-Mox *(Eskayef),* Cap.,250mg, Tk.3.54/Cap.;500mg, Tk.6.07/Cap.; Paed. drops, 125 mg/1.25 ml, Tk.28.32/15 ml; Susp., 125 mg/5ml, Tk.46.40/100 ml; 250 mg/5ml, Tk.65.00/100 ml
Tycil *(Beximco),* Cap., 250 mg, Tk. 3.61/Cap.; 500 mg, Tk. 6.77/Cap.; Paed. drop, 125 mg/1.25 ml, Tk.30.20/15 ml; susp. 125 mg/ 5ml, Tk.46.61/100 ml; 250 mg/5 ml, Tk. 65.25/100 ml
Tymox *(Somatec),* Cap., 500 mg, Tk. 6.02/Cap.; Paed. drop, 125 mg/1.25 ml, Tk. 30.11/15ml; Susp.,125mg/5ml,Tk. 44.67/100ml
Ultramox *(Globe),* Susp., 125 mg /5 ml, Tk. 45.00/100 ml; Cap., 500 mg, Tk. 6.07/Cap.; 250 mg, Tk. 3.50/Cap.

AMPICILLIN [ED]

Indications: UTI, otitis media, sinusitis, chronic bronchitis, *Haemophilus influenzae* infections, invasive salmonellosis, meningococcal disease, listerial meningitis, *H pylori* infection, prophylaxis and treatment of endocarditis

Cautions: allergy to penicillin, renal impairment requires dose reduction,

erythematous rashes common in glandular fever and chronic lymphatic leukemia

Contra-indications: **p**enicillin hypersensitivity

Interactions: *see Appendix-2*

Side-effects: nausea, vomiting, diarrhea; rarely rashes (discontinue treatment), antibiotic-associated colitis

Dose: ORAL*:* 0.25-1g every 6 hours, at least 30 minutes before food; CHILD under 10 years, ½ ADULT dose

By intramuscular or intravenous injection or infusion, 500 mg every 4-6 hours; CHILD under 10 years, ½ of adult dose.

UTI 500 mg every 8 hours
Meningitis (if necessary, in combination with another antibiotic), by intravenous infusion 2 g every 4 hours for 5 days in meningococcal disease or for 10-14 days in listerial meningitis

Proprietary Preparations
Ampimet DS *(Medimet),* Susp., 125mg/5ml, Tk.43.75/100 ml
Ampi *(Albion),* Cap., 250 mg, Tk.2.63/Cap.
Acmecilin *(Acme),* Cap., 250 mg, Tk. 3.32/Cap.; Susp., 2.5 gm/100 ml, Tk. 39.59/100 ml; Inj., 250mg/Vial, Tk. 16.24/Vial; 500 mg/vial, Tk. 22.85/Vial
Ampimet *(Medimet),* Cap. 500mg, Tk.5.00/Cap.; 250 mg, Tk.3.25/Cap.
Ampexin *(Opsonin),* Inj., 250 mg/vial, Tk.13.52/Vial; 500 mg/vial, Tk. 18.05/Vial
Ampirex *(Jayson),* Inj., 500 mg/vial, Tk. 22.42/Vial

1.1.1.2.2 PENICILLINASE-RESISTANT BROAD SPECTRUM PENICILLINS

CO-AMOXICLAV

Co-amoxiclav is a combined preparation of amoxicillin (as the trihydrate or as the sodium salt) and betalactamase inhibitor clavulanic acid (as potassium clavulanate).

Indications: **i**nfections due to beta-lactamase producing strains including RTI, genitourinary and abdominal infections, cellulitis, animal bites, severe dental infection with spreading cellulitis.

Cautions: *see under Ampicillin;* in hepatic impairment and in pregnancy.

CHOLESTATIC JAUNDICE has been identified as an adverse reaction occurring either during, or shortly after, the use of co-amoxiclav. An epidemiological study has shown that the risk of acute liver toxicity was about 6 times greater with co-amoxiclav than with amoxicillin

Contraindications: Hypersensitivity, history of penicillin or co-amoxiclav associated jaundice; hepatic dysfunction

Side-effects: *see under Ampicillin,* also hepatitis, cholestatic jaundice, erythema multiforme, toxic epidermal necrolysis, exfoliative dermatitis, vasculitis, dizziness, headache, convulsions (particularly with high doses or in renal impairment); superficial staining of teeth with suspension, phlebitis at injection site; *see also cautions above.*

Dose: *oral:* amoxicillin, 250mg every 8 hours, doubled in severe infections; CHILD up to 10 years, 125 mg every 8 hours, doubled in severe infections; severe or recurrent purulent respiratory infection, 3 g every 12 hours

Severe dental infections, expressed as amoxicillin, 250 mg every 8 hours for 5 days.

By intravenous injection over 3-4 minutes or *by intravenous infusion*, expressed as amoxicillin, 1 g every 8 hours increased to 1 g every 6 hours in more serious infections; INFANTS up to 3 months 25 mg/kg every 8 hours (every 12 hours in the perinatal period and in premature infants); CHILD 3 months-12 years, 25 mg/kg every 8 hours increased to 25 mg/kg every 6 hours in more serious infections; surgical prophylaxis, 1 g at induction; for high risk procedures (e.g. colorectal surgery) a further 2-3 doses may be given every 8 hours in first 24 hours (longer if significantly increased risk of infection)

Proprietary Preparations

Amoclav *(Techno),* Inj. 500 mg+100 mg/Vial, Tk. 135.00/Vial; (1 gm+200 mg)/Vial, Tk. 200.00/Vial;Tab. 250 mg + 125 mg, Tk. 15.00/Tab.; 500 mg + 125 mg, Tk. 20.00/Tab.; Susp., 400 mg + 57.5 ml/5ml, Tk. 83.00/35 ml; (125mg+ 31.5mg)/5ml, Tk. 130.00/60 ml, Tk. 90.00/100 ml

Cefuxet plus *(Chemist),* Tab., 250 mg + 62.50 mg, Tk. 26.25/Tab.

Clamox *(Opsonin),* Tab., 250 mg + 125 mg, Tk. 12.45/Tab.; 500 mg + 125 mg, Tk. 15.10/Tab.; 875 mg + 125 mg, Tk. 18.87/Tab.; Inj., 500mg + 100 mg/Vial, Tk. 105.66/Vial; 1gm + 200 mg/Vial, Tk. 207.56/Vial; Susp., 400mg + 57.5 mg/5 ml, Tk. 67.92/35 ml; 125 mg + 31.25 mg/5 ml, Tk. 113.21/100 ml

Demoxiclave *(Drug Intl),* Tab., 250 mg + 125 mg, Tk. 16.00/Tab.; 500 mg + 125 mg, Tk. 24.00/Tab.; Susp., 125 mg + 31.25 mg/5 ml, Tk. 150.00/100 ml; 400 mg + 57.50 mg/5 ml, Tk. 90.00/35 ml

Fimoxyclav *(Sanofi),* Inj., 500mg+100mg/Vial, Tk. 150.00/Vial; 1000mg+200mg, Tk. 300.00/Vial; Tab., 250mg + 125mg, Tk. 25.00/Tab.; 500mg+125mg,Tk. 32.00/Tab.; 875mg+125mg, Tk. 45.00/Tab.; Susp., 400mg+57mg/5ml, Tk. 245.00/50 ml; 125mg+31.25mg/5ml, Tk.245.00/100 ml

Mimoxclav *(Albion),* Tab. , 250 mg + 125 mg, Tk. 16.57/Tab.; 500 mg + 125 mg, Tk.20.07/Tab.

Moxaclav *(Square),* Inj., 500mg+100mg, Tk. 140.00/Vial; 1000mg+200mg, Tk. 275.00/Vial; Tab., 250mg+125mg, Tk. 20.00/Tab.; 500mg+125mg, Tk 25.00/Tab.; 875 mg+125mg, Tk. 30.00/Tab.; 125mg+31.25mg/ 5 ml, Tk. 135.51/60 ml; Tk. 175.00/100 ml; 400 mg+ 57.5 mg/ 5 ml, Tk. 90.34/35 ml

Tyclav *(Beximco),* Tab., 250 mg + 125 mg, Tk. 20.00/Tab.; 500 mg + 125 mg, Tk. 25.00/Tab.; 875 mg + 125 mg, Tk. 35.00/Tab.

1.1.1.3 EXTENDED SPECTRUM (ANTIPSEUDOMONAL) PENICILLINS

This group consists of extended-spectrum drugs that exhibit the antimicrobial activity of broad-spectrum penicillins and also are effective against *Psuedomonus aeruginosa, Klebsiella pneumonia*, *Proteus sp.* and *Bacteroids fragilis.* The **carboxypenicillin**, **ticarcillin**, is principally indicated for serious infections due *to P aeruginosa* and also has activity against certain other Gram-negative bacilli including *Proteus spp.* and *B fragilis*. The ureidopenicillin, piperacillin is more active than ticarcillin against Ps. aeruginosa. These drugs have two major limitations: they are inferior to ampicillin against Gram-positive cocci and *Listeria monocytogenes* and secondly, they are sensitive to destruction by penicillinases. To overcome the second problem, these drugs are usually combined with penicillinase enzyme-inhibitor agents. **ticarcillin** combined with **clavulanic acid** is active against betalactamase producing bacteria resistant to ticarcillin alone. **pipericillin** is available in combination with beta-lactamases inhibitor tazobactam. For *Pseudomonas septicemias* (especially in neutropenia or endocarditis) these antipseudomonal penicillins are given with an aminoglycoside (e.g. **Gentamicin**) since they have a synergistic effect. Penicillins and aminoglycosides must not be mixed in the same syringe or infusion.

PIPERICILLIN WITH TAZOBACTAM

Indications: *P. aeruginosa* infections, surgical prophylaxis, also *see under Dose*

Cautions: *see under Benzyl penicillin*

Contra-indications: *see under Benzyl penicillin*

Side-effects: *see under Benzyl penicillin;* also nausea, vomiting, diarrhea, less commonly stomatitis, dyspepsia, constipation, jaundice, hypotension, headache, insomnia; rarely abdominal pain, hepatitis, edema; very rarely hypoglycemia, hypokalemia, pancytopenia, Stevens-Johnson syndrome, toxic epidermal necrolysis.

Dose: lower respiratory tract, urinary tract, intra-abdominal, and skin infections, and septicemia: ADULT and CHILD over 12 years, by IV inj. over 3-5 minutes or by IV infusion: 100-150 mg/kg daily in divided doses, or increased to 200-300 mg/kg daily in severe infections and at least 16 g daily in life-threatening infections. NEONATES IV injection over 3-5 minutes or IV infusion, aged up to 7 days or over 7 days but under 20 kg, 150 mg/kg daily in 3 divided doses, aged over 7 days and over 20 kg, 300 mg/kg/d

in 3-4 divided doses; CHILD 1 month-12 years: 100-200 mg/kg daily in 3-4 divided doses, increased to 200-300 mg/kg daily in 3-4 divided doses for severe infections; *surgical prophylaxis*: 2 g just before surgery followed by at least 2 doses of 2 g at 4/6 hours intervals within 24 hours of surgery.

Proprietary Preparations

Brodactam *(Sanofi),* Inj.,(IV Infusion), 4 gm + 0.5 gm, Tk. 1,000.00/Vial
Megacilin *(Popular),* Inj.,(IV Infusion), 4 gm + 0.5 gm, Tk. 1,003.77/Vial
Tazocil *(Square),* Inj.,(IV Infusion), 4 gm + 0.5 gm, Tk. 1,000.00/Vial
Tazopen *(Renata),* Inj.,(IV Infusion), 4 gm + 0.5 gm, Tk. 1,000.00/Vial
Tazosyn *(ACI),*Inj.,(IV Infusion), 2 gm + 0.25 gm, Tk. 600.00/Vial; 4 gm + 0.5 gm, Tk. 1,000.00/Vial

1.1.1.4 MECILLINAMS

PIVMECILLINAM HYDROCHLORIDE

Pivmecillinam has significant activity against many Gram-negative bacteria including *E. coli, Klebsiella, Enterobacter* and *Salmonellae.* It is not active against *Pseudomonas aeruginosa* or *Enterococci.* Pivmecillinam is hydrolyzed to mecillinam, which is the active drug.

Indications: acute uncomplicated cystitis, chronic or recurrent bacteriuria, UTI

Cautions: *see under Benzylpenicillin;* liver and renal function tests required in long term use; pregnancy; avoid in acute porphyria

Contraindications: *see under Benzylpenicillin:* also carnitine deficiency, esophageal strictures, gastrointestinal obstruction; not recommended for infants under 3 months

Interactions: *see Appendix-2*

Side-effects: *see under Benzyl-penicillin;* also nausea, vomiting, dyspepsia; and reduced serum and total body carnitine (during repeated or long term use)

Dose :*oral*: acute uncomplicated cystitis, ADULT and CHILD over 40 kg, initially 400 mg then 200 mg every 8 hours for 3 days; *chronic or recurrent bacteriuria*, ADULT and CHILD over 40 kg, 400 mg every 6-8 hours; *UTI*, CHILD under 40 kg, 20-40 mg/kg daily in 3-4 divided doses

Note: Tablets should be swallowed whole with plenty of fluid during meals while sitting or standing

Proprietary Preparations

Alexid *(Aristo),* Tab.,200 mg, Tk. 15.00/Tab.
Emcil *(Square),* Tab.,200 mg, Tk. 12.05/Tab.
Lexipen*(Techno),*Tab.,200 mg, Tk. 11.66/Tab.
Pivcilin *(Rangs),* Tab., 200 mg, Tk. 12.00/Tab.
Pivicil *(General),* Tab.,200 mg, Tk.12.05/Tab.,

1.1.2 CEPHALOSPORINS

1.1.2.1 FIRST-GENERATION DRUGS
1.1.2.2 SECOND-GENERATION DRUGS
1.1.2.3 THIRD-GENERATION DRUGS
1.1.2.4 FOURTH-GENERATION DRUGS

Cephalosporins are broad-spectrum, bactericidal antibiotics and are classified into "generations" on the basis of general features of antimicrobial activity.

Of the first generation, **cefazolin** is more susceptible to hydrolysis by betalactamase from *S. aureus* than is cephalothin. Second generation **cefoxitin** and **cefuroxim**e and third generation drugs are more resistant than first generation agents to betalactamases produced by gram-negative bacteria. Third generation drugs are susceptible to hydrolysis by chromosomally encoded type 1 beta-lactamases induced by treatment of infections due to aerobic gram-negative bacilli with second- or third-generation drugs and/or imipenem. Fourth generation agents such as **cefipime**, are poor inducers of type 1 beta-lactamases and are less susceptible than third generation drugs to hydrolysis by type 1 beta-lactamases.

Cautions:. Great caution should be taken before administration of a cephalosporin in patients who have had a recent severe, immediate reaction to penicillin,impaired renal function, pregnancy and breast-feeding.

Side-effects: hypersensitivity reactions. Immediate reactions such as anaphylaxis, bronchospasm, and urticaria are seen.

Cephalosporins are potentially nephrotoxic drugs. Gastrointestinal upset in the form of diarrhea can result after cephalosporins and may be more frequent with **cefoperazone** and **cefpiramide** because of their greater biliary excretion.

Serious bleeding related either to hypoprothrombinemia, thrombocytopenia, and/or platelet dysfunction has been reported with several beta lactam antibiotics including cephalosporins.

1.1.2.1.1 FIRST-GENERATION CEPHALOSPORINS

First generation drugs (cefadroxil, cephalexin, cphradine etc.) are very active against gram-positive cocci including pneumococci, streptococci and staphylococci and have modest activity against gram-negative microorganisms. Most oral cavity microbes, except B.fragilis group are sensitive. Activity against Moraxella catarrhalis, E. coli, K. pneumonia and P. mirabilis is good. They are not effective against enterococci, methicillin-resistant S. aureus and S. epidermidis, P. aeruginosa.

CEFADROXIL

Indications: urinary tract infections, minor polymicrobial infections, i.e. cellulites, soft tissue abscess, ottitis media, sinusitis
Cautions: *see notes above*

Contra-indications: hypersensitivity, porphyria
Interactions: *see Appendix-2*

Side-effects: gastrointestinal upset in the form of diarrhea, nausea and vomiting, abdominal discomfort, rarely antibiotic-associated colitis, headache, allergic reactions including rashes, pruritus, urticaria, serum-sickness like reactions with rash, fever and arthalgia and anaphylaxis, erythema multiforme, toxic epidermal necrolysis, hepatic enzymes disturbances, transient hepatitis and cholestatic jaundice; other reported effects are eosinophilia and blood disorders including thrombocytopenia, leucopenia, agranulocytosis, aplastic and hemolytic anemia, reversible interstitial nephritis, hyperactivity, nervousness, sleep disturbances, confusion, hypertonia and dizziness; *also see notes above*
Dose: *oral*: patients weighing > 40 kg: 0.5-1 g twice daily; CHILD < 1 year 25 mg/kg daily in 2-3 divided doses; 1-6 years 250 mg twice daily; > 6 years 500 mg twice daily

Proprietary Preparations
Adocil *(Kemiko),*Susp., 125 mg/5 ml, Tk. 80.00/100 ml; Cap., 500 mg, Tk. 12.00/Cap.
Adora *(Incepta),* Paed. drops., 1.50 gm/15 ml, Tk. 50.00/15 ml; Susp.,125 mg/5 ml, Tk. 70.00/100 ml; Tk. 50.00/60 ml; Cap., 500 mg, Tk. 15.00/Cap.
Arocef *(Eskayef),* Cap., 500 mg, Tk. 15.00/Cap.; Susp.,125 mg/5 ml, Tk.70/70 ml
Bexen *(Nipro JMI),* Cap., 500 mg, Tk. 12.05/Cap.; Susp.,125mg/5 ml,Tk.70.26/100ml
Cefadroxil *(Albion),* Susp.,125 mg/5ml,Tk. 90.00/100ml
Droxil *(Rangs),* Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 70.00/100 ml; Cap., 500 mg, Tk. 12.00/Cap. DS Susp., 250 mg/5 ml,Tk. 90.56/100 ml
Fodexil *(Square),* Cap., 500 mg, Tk. 15.00/Cap.
Licef *(Asiatic),* Susp., 125 mg/5 ml, Tk. 82.00/100 ml; Cap., 500 mg, Tk.13.96/Cap.
Sefanid *(Drug Inl),* Susp., 125 mg/5 ml,Tk.70.00/100ml; Cap. 500 mg, Tk. 12.00/Cap.
Trubid *(Opsonin),* Susp., 125 mg/5 ml, Tk. 37.74/60 ml; Tk. 52.83/100 ml; Cap., 500 mg, Tk. 11.28/Cap.
Twicef *(Acme),* Cap., 500 mg, Tk. 12.05/Cap.; Susp., 125 mg/5ml, Tk.70.26/100 ml; 250 mg/5 ml, Tk. 120.46/100 ml

CEPHALEXIN

(Cefalexin)

Indications: prophylaxis of recurrent UTI; also *see* under cefadroxil
Cautions, Contraindications and **Side-effects:** *see under cefadroxil*

Interactions: *see Appendix-2*
Dose: *oral:* ADULT 250-500 mg every 8-12 hours for mild to moderate infections; for severe infections increased to 1-1.5 g every 6-8 hours, as prophylactic in recurrent urinary tract infections, 125 mg at night; CHILD 25 mg/kg daily in 2-3 divided doses, doubled for severe infections, max. 100 mg/kg daily in divided doses;
under 1 year, 125 mg every 12 hours; 1-5 years, 125 mg every 8 hours; 6-12 years, 250mg every 8 hours

Proprietary Preparations

Acelex *(Acme),* Cap., 250 mg, Tk. 6.63/Cap.; Cap., 500 mg, Tk. 12.54/Cap.; Susp., 125 mg/5 ml,Tk. 77.29/100 ml ,
Cepalexin *(Albion),* DS Cap., 250 mg, Tk. 6.86/ Cap.;Susp.,125 mg/5 ml, Tk.85/100ml
Ceporal *(Medimet),* Susp., 125mg/5ml, Tk.78.00/100ml; Cap., 250mg, Tk.5.50/Cap.; 500mg, Tk.10.00/Cap.
Hi-cef *(Hudson),* Susp., 125mg/5ml, Tk.70.00/100 ml; Cap., 500mg, Tk.10.50/Cap.
Neorex *(Eskayef),* Cap, 500 mg, Tk. 12.50/Cap.
Nufex*(Genera),* Cap., 500 mg, Tk. 9.03/Cap.; Susp.,125 mg/5 ml, Tk. 78.29/100 ml
Porex *(Albion),* Cap., 500 mg, Tk. 12.64/ Cap.
Supralex *(Biopharma),* Cap., 250 mg, Tk. 6.52/Cap.; Cap. 500 mg, Tk. 12.05/Cap.; Susp., 125 mg/5 ml, Tk. 77.29/100 ml

CEPHRADINE

Indications: surgical prophylaxis, also *see under cefadroxil*
Cautions, Contraindications and **Side-effects:** *see under cefadroxil*

Interactions: *see Appendix-2*

Dose: *oral*: ADULT 250-500 mg every 6 hours or 0.5-1 g every 12 hours for mild to moderate infections; for severe infections increased to 1 g every 6 hours; CHILD 25-50 mg/kg daily in 2-4 divided doses; deep IM inj. or IV inj. over 3-5 minutes or IV infusion 0.5-1 g every 6 hours for mild to moderate infections; for severe infections increased to 8 g daily; CHILD 50-100 mg/kg daily in 4 divided doses; in surgical prophylaxis: 1-2 g by deep IM inj. or by IV inj. *over 5 minutes.*

Proprietary Preparations

Abac *(Chemist),* Susp., 100 ml, Tk. 81.92/100ml; Paed. drop, 15 ml, Tk. 50.00/15 ml; Cap., 500mg, Tk. 26.25/Cap.
Adecef *(Supreme),* Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Cap., 500 mg, Tk. 15.00/Cap.
Ancef *(Unimed),* Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 85.00/100 ml; 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 250 mg, Tk.50/Cap.; 500 mg, Tk.12.50/Cap.
Aphrin *(Apex),* Susp., 125 mg/5 ml, Tk. 80.00/100 ml; Cap., 500 mg, Tk.12.00/Cap.
Avlosef *(ACI),* Inj., 500 mg /Vial, Tk. 56.21/Vial;1 gm/Vial, Tk. 80.30/Vial; Paed. drops, 125 mg/1.25ml , Tk. 50.19/15 ml; Susp., 125 mg/5 ml, Tk. 82.31/100 ml; 250 mg/5 ml, Tk. 120.45/100 ml; Cap., 250mg, Tk. 6.52/Cap.; 500 mg, Tk. 12.55/Cap.
Belocef *(Amico),* Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 80.00/100 ml; 250 mg/5 ml, Tk. 110.00/100 ml; Cap., 250 mg, Tk. 6.50/Cap.; 500 mg, Tk.12.50/Cap.
Benocef *(Benham),* Susp., 125 mg/5 ml, Tk. 79/100 ml; 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 250 mg, Tk.6.55/Cap.; 500 mg, Tk.12.50/Cap.
Betasef *(Alco),* Paed. drops.; 125 mg/1.25 ml, Tk. 51.00/15 ml; Susp., 125 mg/5 ml, Tk. 79/100 ml; 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 250 mg, Tk.6.58/Cap.; 500 mg, Tk.12.65/Cap.
Cefadin *(Ziska),* Paed. drops.; 125mg/5ml, Tk. 80.00/100ml; Inj., 1g, Tk. 80.00/ vial; 500mg, Tk. 50.00/Vial; Cap., 500mg, Tk 10.00/Cap.
Cefamak *(Maks),* Susp., 125 mg/5 ml, Tk. 80/100 ml; Cap., 500 mg, Tk. 12.50/Cap.
Cefasia *(Pharmasia),* Susp., 125 mg/5 ml, Tk. 80.31/100 ml; Susp., 250 mg/5 ml, Tk. 140.00/100 ml; Cap., 500 mg, Tk. 13.00/Cap.
Cefracef *(Nipro JMI),* Susp., 125 mg/5 ml , Tk. 80.31/100 ml; Cap., 250 mg, Tk. 6.53/Cap.; Cap., 500 mg, Tk. 12.55/Cap.
Ceframed *(Medimet),* Susp., 125mg/5ml, Tk.80.00/100ml; Tk.50.00/15ml; Inj., 1gm, Tk.75.00/Vial; 250mg, Tk.33.00/Vial, 500mg, Tk.46.50/Vial; Cap., 250mg, Tk.7.00/Cap. 500mg, Tk.12.00/ Cap.

1. ANTI-INFECTIVES

Cefrasyn *(MST),* Susp., 2.5 gm/100 ml, Tk. 80/100 ml; Cap., 500 mg, Tk. 13/Cap.
Ceodin *(Central),* Susp., 125 mg/5 ml, Tk. 80/100 ml; Cap., 250 mg, Tk. 6.50/Cap.; 500 mg, Tk. 12.25/Cap.
Cephradine *(Albion),* Susp., 125 mg/5 ml, Tk. 86.00/100ml; 250 mg/5 ml, Tk. 120.00/100ml; Cap., 500 mg, Tk. 15.17/Cap.;DS Paed. dorps, 125 mg/1.25 ml, Tk. 60.00/15ml
Cephran *(Opsonin),* Inj., 500 mg/Vial, Tk. 40.75/Vial; 1gm/Vial, Tk. 60.38/Vial; Paed. Drops, 125 mg/1.25 ml, Tk. 37.74/15 ml; Susp., 125 mg/5 ml, Tk. 60.38/100 ml; 250 mg/5 ml, Tk. 90.56/100 ml; Cap., 500 mg, Tk. 9.44/Cap.
Cusef *(Delta),* Cap., 250 mg, Tk. 6.50/Cap.; 500 mg, Tk. 12.50/Cap.; Susp., 250 mg/5 ml, Tk. 80.00/100 ml
Dicef *(Drug Intl),* Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 81.00/100 ml; 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 250 mg, Tk. 7.00/Cap.; 500 mg, Tk.13.00/Cap.
Dolocef *(Techno),* Susp., 125 mg/5 ml, Tk. 86/100 ml; Cap., 250 mg, Tk. 6.50/Cap.; 500 mg,Tk.12.50 /Cap.
Eusef *(Globe),* Paed. drops , 125 mg /1.25 ml, Tk. 50.00/15 ml; Inj., 500 mg, Tk. 50.00/Vial; 1 gm, Tk. 80.00/vial; Powder for Suspn., 250 mg /5 ml, Tk. 120.00/100 ml; Powder for Suspn. 125 mg /5 ml, Tk. 80.00/100 ml; Cap., 500 mg, Tk. 12.00/Cap.;
Extracef *(Aristo),* Inj., 500 mg, Tk.50.00/Vial; 1gm/vial, Tk. 80.00/Vial; Paed. drops,125mg/1.25 ml, Tk.50/15ml Susp., 125 mg/5 ml, Tk. 82/100 ml; 250 mg/5 ml, Tk. 125/100 ml; Cap., 250 mg, Tk.6.50/Cap.; 500 mg, Tk.12.50/Cap.
G-Cephradine *(Gonoshasthaya),* Paed. drops,; 125 mg/1.25 ml, Tk.40.00/15 ml; Susp., 125 mg/5 ml, Tk.65.00/100 ml; Cap., 500 mg, Tk 10.50/Cap.; Inj., 500 mg/Vial, Tk.40.00/Vial
Gigacef *(Pacific),* Paed. drops, 125 mg/1.25ml, Tk. 34.59/15 ml; Susp., 125 mg/5 ml, Tk. 48.12/100 ml; Cap., 500 mg, Tk. 9.55/Cap.
Intracef *(Beximco),* Paed. drops,; 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 80.00/100 ml; 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 250 mg, Tk.6.50/Cap.; 500 mg, Tk.12.50/Cap.
Jedine *(Ad-din),* Paed. drop, 125mg/1.25ml, Tk. 50.00/15 ml; Suspn. , 125mg/5ml, Tk. 80.00/100 ml; Cap., 500mg, Tk. 12.50/Cap.
Kefdrin *(GSK),* Susp., 125 mg/5 ml, Tk. 75.92/100 ml; Cap., 500 mg, Tk. 22.96/Cap.
Keprad *(Sonear),* Cap., 250 mg, Tk. 8.20/Cap.; 500 mg, Tk.15.38/Cap.
Lebac *(Square),* Inj., 500 mg/Vial, Tk.65.00/Vial; 1 gm/Vial, Tk.95.00/Vial; Paed. drops, 125 mg / 1.25 ml, Tk. 65.00/15 ml; Susp., 125 mg/5 ml, Tk. 90.00/100 ml; 250 mg/5 ml, Tk. 135.00/100 ml; Cap., 250 mg, Tk.8.00/Cap.; 500 mg , Tk.15.00/Cap.;
Lidocef *(Leon),* Susp., 125 mg/5 ml, Tk. 80.00/100 ml; Cap., 500 mg, Tk. 12.50/Cap.
Lindex *(Rangs),* Paed. drops, 125 mg / 1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg / 5 ml, Tk. 80.00/100 ml; Inj., 1gm/vial, Tk. 80.00/Vial; Cap., 250mg, Tk. 6.50/Cap.; 500mg, Tk. 12.50/Cap.; Susp., 250mg/5ml, Tk. 120.00/100 ml; Inj., 500mg, Tk. 50.00/Vial
Mega-cef *(Hudson),* Susp., 125mg/5ml, Tk.81.00/100 ml; Cap., 500mg, Tk.11.90/Cap.
Mycef *(Ambee),* Susp., 125 mg /5 ml, Tk. 80.31/100 ml; 250 mg/5 ml , Tk. 120/100 ml; Paed drops, 125 mg/1.25 ml , Tk. 50.19/15 ml; Cap., 500 mg, Tk.12.54/Tab
Orgacef *(Organic),* Susp., 125 mg/5 ml, Tk. 80.00/100 ml; Cap., 250 mg, Tk. 6.50/Cap.; Cap., 500 mg, Tk. 12.50/Cap.
Pantacef *(Bios),* Susp., 125 mg/5 ml, Tk. 78.00/100 ml; Cap., 250 mg, Tk.6.25/Cap.; Cap., 500 mg, Tk. 12.00/Cap.
Polycef *(Renata),* Paed. drops, 125 mg/1.25 ml, Tk. 62.00/15 ml; Susp., 250 mg/5 ml, Tk. 90.00/100 ml; Inj., 250 mg/vial, Tk.38.10/Vial; 500 mg/Vial, Tk.65.00/Vial; 1 gm/Vial, Tk. 90.00/Vial; Cap., 250 mg, Tk. 6.52/Cap.; 500 mg, Tk. 12.54/Cap.
Polycef *(Renata),* Susp.,125 mg/5 ml, Tk. 80.30/100 ml;DS Susp., 250 mg/5 ml, Tk. 132.00/100 ml
Procef *(Incepta),* Inj., 250 mg/Vial, Tk.30.00/Vial; 500 mg/Vial, Tk.50.00/Vial; 1 gm/Vial, Tk.80.00/Vial; Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 80.00/100 ml; 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 250 mg, Tk. 6.50/Cap.; 500 mg, Tk. 12.50/Cap,
Reocef *(Rephco),* Susp., 125 mg/5 ml, Tk.87.00/100 ml; Cap., 500 mg, Tk. 15/Cap.
Rocef *(Healthcare),* Susp., 125 mg/5 ml, Tk. 85/100 ml; Cap., 250 mg, Tk. 6.50/Cap.; 500 mg, Tk. 12.50/Cap.; Susp., 250 mg/5 ml, Tk. 120.00/100 ml
Roxicef *(Popular),* Paed. drops, 125 mg/1.25 ml, Tk. 50.19/15ml; Susp., 125 mg/5 ml, Tk. 80.30/100ml; 250 mg/5 ml, Tk. 120.45/100ml; Inj., 500mg/Vial, Tk. 50.19/Vial; 1gm/Vial, Tk. 80.30/Vial; Tab., 500mg, Tk. 12.55/Tab.
Sefcon *(Concord),* Susp., 250 mg/5 ml, Tk. 120/100 ml; Cap., 500 mg, Tk. 12.50/Cap.
Sefin *(Orion),* Inj, 250 mg/Vial, Tk. 35.13/Vial; 500 mg/Vial, Tk.50.19/Vial; 1 gm/Vial, Tk. 80.30/Vial; Paed. drops, 125 mg/1.25 ml, Tk. 50.19/15 ml; Cap., 250 mg, Tk. 6.53/Cap.; 500 mg, Tk. 12.55/Cap.; Susp, 125mg/5 ml, Tk.80.30/100 ml; 250 mg/5 ml, Tk.120.45/ 100ml
Sefrad *(Sanofi),* Paed. drops, 125 mg/1.25 ml, Tk. 65.00/15 ml; Susp., 125 mg/5 ml, Tk. 95.00/100 ml; 250 mg/5 ml, Tk. 130.00/100 ml;

Cap., 250mg, Tk. 10.00/Cap.; 500mg, Tk. 16.00/Cap.; Inj., 250mg/Vial, Tk.35.14/Vial; 500mg/Vial, Tk.60.00/Vial; 1gm/Vial, Tk.90.33/Vial
Sefril *(Acme),* Inj., 500mg/Vial, Tk.65.00/Vial; 1 gm/Vial, Tk. 90.00/Vial; Paed. drops, 125 mg/1.25 ml, Tk. 62.00/15 ml; Susp., 125 mg/5 ml, Tk. 90.00/100 ml; 250 mg/5 ml, Tk. 120.46/100 ml; Cap., 250 mg, Tk. 8.00/Cap.; 500 mg, Tk. 15.00/Cap.
Sefro *(Navana),* Susp., 125 mg/5 ml, Tk. 80.29/100 ml;Paed. drops, 125 mg/1.25 ml, Tk. 60.00/15 ml
Seftec *(APC),* Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 86.00/100 ml; Cap., 500 mg, Tk.12.50/Cap.
Sephar *(RAK),* Susp., 125 mg/5 ml, Tk. 80.00/100 ml; 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 500 mg , Tk. 12.5/Cap.
Sinaceph *(Ibn Sina),* Inj., 500 mg/Vial, Tk.55.00/Vial ; 1 gm/Vial, Tk.85.00/Vial; Paed. Drop, 125 mg/1.25 ml, Tk. 55.00/15 ml; Susp., 125 mg/5 ml, Tk. 85.00/100 ml; 250 mg/5 ml, Tk. 125.00/100 ml; Cap., 250 mg, Tk. 6.80/Cap.; 500 mg, Tk.13.00/Cap.
SK-Cef *(Eskayef),* Inj, 500 mg/Vial, Tk.50.00/Vial; 1 gm/Vial, Tk. 80.00/Vial; Paed. drops, 125 mg/1.25 ml, Tk. 51.00/15 ml; Susp., 125 mg/5 ml, Tk. 82.00/100 ml; 250 mg/5 ml, Tk. 80.00/60 ml; 250 mg/5 ml, Tk. 140.00/100 ml; Cap, 250 mg, Tk. 6.57/Cap.; 500 mg, Tk. 8.13/Cap.;
Supracef *(Biopharma),* Cap., 250 mg, Tk. 6.73/Cap.; Cap., 500 mg, Tk.12.55/Cap.; Paed. drops, 125 mg/1.25 ml, Tk. 50.19/15 ml; Susp., 125 mg/5 ml, Tk. 80.30/100 ml; Susp., 250 mg/5 ml, Tk. 120.45/100 ml; Inj., 250 mg/Vial, Tk.35.13/Vial; Inj., 500 mg/Vial, Tk. 50.19/Vial; Inj., 1 gm/Vial, Tk.74.28/Vial;
Tydin *(Somatec),* Paed. drops, 125 mg/1.25 ml, Tk. 48.18/15 ml; Susp., 125 mg/5 ml, Tk. 78.29/100 ml; Susp., 250 mg/5 ml, Tk. 120.46/100 ml; Cap., 500 mg, Tk. 12.50/Cap.
Ultrasef *(Jayson),* Paed. drops, 125 mg/1.25 ml, Tk. 50.19/15 ml; Susp., 125 mg/5 ml, Tk. 90.00/100 ml; Cap., 250 mg, Tk. 6.77/Cap.; Cap., 500 mg, Tk. 12.54/Cap.
Vecef *(Asiatic),* Paed. drop, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 80.00/100 ml; Susp., 250 mg/5 ml, Tk. 120.00/100 ml; Cap., 500 mg, Tk.12.50/Cap.
Velogen *(General),* Paed. drops, 125 mg/1.25 ml, Tk. 50.19/15 ml; Cap., 250 mg, Tk. 6.52/Cap.; 500 mg, Tk. 12.55/Cap.;Susp.,125 mg/5 ml,Tk. 82.31/100ml
Velox *(Kemiko),* Paed. drops, 125 mg/1.25 ml, Tk. 50.00/15 ml; Susp., 125 mg/5 ml, Tk. 80.00/100 ml; Cap., 250 mg, Tk. 7.00/Cap.; 500 mg, Tk. 13.00/Cap.
Wincef *(White Horse),* Susp., 125 mg/5 ml, Tk. 80.30/100 ml; Cap., 500 mg, Tk. 12.50/Cap.

1.1.2.1.2 SECOND-GENERATION CEPHALOSPORINS

Compared to first generation, second generation cephalosporins are more active against gram-negative microorganisms but such activity is less than third generation agents. A subset of second generation i.e. cefoxitin, cefotetan and cefmetazole also is active against *B. fragilis.*

CEFACLOR

Indications: sinusitis, otitis and lower respiratory infections caused by beta-lactamase producing *H. influenza* or *B. catarrhalis*, also *see under cefadroxil*

Cautions: penicillin hypersensitivity, pregnancy, breast-feeding, renal impairment*;* false positive urinary glucose test and false positive Coombs' test
Contraindications and **Side-effects:** see under cefadroxil

Interactions: *see appendix-2*
Dose: *oral*, ADULT 250 mg every 8 hour for mild to moderate infections; for severe infections increased to 500 mg every 8 hour up to a max. of 4 g daily in 3 divided doses; CHILD > 1 month, 20 mg/kg daily in 3 divided doses for mild to moderate infections; for severe infections increased to 40 mg/kg every 8 hour up to a max. of 1 g daily in 3 divided doses

Proprietary Preparations
Abaclor *(ACI),* Cap., 250 mg , Tk. 21.08/Cap.; 500 mg , Tk. 40.15/Cap.;Paed. drops, 100 mg/ml , Tk. 125.47/15 ml; Susp. 125 mg/5 ml, Tk. 200.75/100 ml
Alclor *(Acme),* Paed. drops, 125 mg/1.25 ml, Tk. 125.00/15 ml; Susp., 125 mg/5 ml, Tk. 190.00/100 ml; Cap., 500 mg, Tk. 40.00/Cap.
B-Clor *(Benham),* Susp., 125 mg/5 ml, Tk. 195.00/100 ml; Cap., 500 mg, Tk. 38.42/Cap.

Biocef *(Novartis),* Susp., 125 mg/5 ml, Tk. 295.00/100 ml; Cap., 250 mg, Tk. 25.00/Cap.; 500 mg, Tk. 46.00/Cap.
Ceflon *(Eskayef),* Paed. drops, 125 mg/1.25 ml, Tk. 125.00/15 ml; Susp., 125 mg/5 ml, Tk. 200.00/100 ml
Cfl *(Sharif),* Paed. drops, 125 mg/1.25 ml, Tk. 125.00/15 ml; Susp., 125 mg/5 ml, Tk. 190.00/100 ml
Clobac *(Opsonin),* Susp., 125 mg/5 ml, Tk. 135.85/100 ml; Paed. drops., 125 mg/1.25 ml, Tk. 94.34/15 ml
Clocef *(Amico),* Susp., 125 mg/5 ml, Tk. 175.00/100 ml; Cap., 250 mg, Tk. 18.00/Cap.; 500 mg, Tk. 30.00/Cap.
Clorocef *(Ibn Sina),* Paed. drops, 125 mg/1.25 ml, Tk. 130.00/15 ml; Susp., 125 mg/5 ml, Tk. 205.00/100 ml; 250 mg, Tk. 22.00/Cap.; 500 mg, Tk. 40.00/Cap.
Loracef *(Square),* Paed. drops, 125 mg/1.25 ml, Tk. 125.47/15 ml;Susp., 125 mg/5 ml, Tk. 190.72/100 ml; Cap., 500 mg, Tk. 38.15/Cap.
Navacef *(Navana),* Paed. drops, 125 mg/1.25 ml, Tk. 125.45/15 ml; Susp., 125 mg/5 ml, Tk. 190.70/100 ml; Tk. 130.48/60 ml; Cap., 250 mg, Tk. 21.07/Cap.; 500 mg, Tk. 40.15/Cap.
Oticlor *(Incepta),* Susp., 125 mg/5 ml, Tk. 180.00/100 ml; Cap., 500 mg, Tk. 125.00/15 ml; Paed. drops, 125 mg/1.25 ml, Tk. 125.00/15 ml

CEFOXITIN

Indications: as prophylactic against intestinal anerobes in colorectal surgery, mixed anerobic infections, i.e. peritonitis, diverculitis, infections due to facultative gram-negative bacteria, i.e. pelvic inflammatory disease, diabetic foot infection; also see under Cefadroxil **Cautions, Contra-indications, Side-effects:** *see under Cefadroxil*

Interactions: *see Appendix-2* (probenecid reduces the renal clearance of Cefoxitin)
Dose :*by deep IM or slow IV inj. or IV infusion* 1-2 g every 6-8 hours for mild to moderate infections; increased up to 12 g daily in 3-4 divided doses for severe infections; CHILD recommended route IV; up to 1 week, 20-40 mg/kg every 12 hours, 1-4 weeks 20-40 mg/kg every 8 hours in mild to moderate infections, increased to 200 mg/kg daily in 3-4 divided doses up to a max.of 12 g daily in severe infections; surgical prophylaxis: by deep IM or slow IV inj. or IV infusion 2 g, 30-60 minutes before surgery, repeated every 6 hours for 24 hours; CHILD 30-40 mg/kg 30-60 minutes before surgery, repeated every 6 hours for 24 hours (second and third doses every 8-12 hours in neonates); in uncomplicated UTI, Cefoxitin 1 g twice daily has been given intramuscularly

Proprietary Preparation
Cefot *(ACI),* Inj.,1 gm/Vial, Tk. 132.00/Vial ; 250 mg/Vial;Tk. 50.00/Vial;2 gm/Vial,Tk. 250.00/Vial;500 mg/Vial,Tk. 76.00/Vial
Cefotax *(Renata,),* Inj.,1 gm/Vial,Tk. 180.00/Vial;250 mg/Vial, Tk. 75.00/Vial **;** 500 mg/Vial, Tk. 100.00/Vial
Cefotime *(Incepta),* Inj.,1 gm/Vial, Tk. 132.00/Vial;250 mg/Vial, Tk. 50.00/Vial ; 500 mg/Vial, Tk. 76.00/Vial
Ceftax *(Opsonin),* Inj.,1 gm/Vial, Tk. 99.62/Vial;250 mg/Vial, Tk. 37.74/Vial; 500 mg/Vial, Tk. 57.36/Vial
Maxcef *(Square),* Inj.,1 gm/Vial, Tk. 140.00/Vial ;,250 mg/Vial,Tk. 70.00/Vial ; 500 mg/Vial, Tk. 90.00/Vial
Taxceph *(Ibn Sina),* Inj.,1 gm/Vial, Tk. 140.00/Vial;250 mg/Vial, Tk. 52.00/Vial ;500 mg/Vial,Tk. 76.00/Vial
Taxim *(Acme),* Inj.,1 gm/Vial, Tk. 150/Vial; 250 mg/Vial,Tk. 75.00/Vial;500 mg/Vial, Tk.100/Vial
Torped *(Orion),* Inj.,1 gm/Vial, Tk. 130.49/Vial; 250 mg/Vial, Tk. 50.19/Vial; 500mg/Vial, Tk. 75.28/Vial

CEFPROZIL

Indications: upper Respiratory tract infection, Skin and Soft tissue infections

Cautions: *see under Cefaclor*

Contra-indications, Side-effects: *see under Cefadroxil*
Dose: URTI and Skin *and* Soft tissue infections, 500 mg once daily usually for 10 days; CHILD 6 months – 12 years; 20 mg/kg (Max 500 mg) once daily. Acute exacerbations of chronic bronchitis, 500 mg every 12 hours usually for 10 days. Otitis media, CHILD 6 months-12 years, 20 mg/kg (max 500 mg) every 12 hours

Proprietary Preparation
Cefozil *(Popular)*, Tab., 250mg, Tk. 30.11/Tab.; 500mg, Tk. 55.21/Tab.; Susp., 125 mg/5 ml, Tk.230.87/50 ml

CEFUROXIME

Indications: surgical prophylaxis, Lyme disease, community acquired pneumonia especially where beta-lactamase producing *H influenza* or *K pneumonia* is a consideration, gonorrhea, also *see under cefadroxil*

Cautions: *see under Cefaclor;* also pregnancy, breast-feeding and renal impairment *(Appendix-4)*

Interactions: *see Appendix-2*

Contraindications and **Side-effects:** *see under cefadroxil*

Dose: *oral* as cefuroxime axetil, 250 mg twice daily for mild to moderate infections, increased to 500 mg twice daily for severe infections and for pneumonia; for urinary tract infections 125 mg twice daily, doubled in pyelonephritis; for gonorrhea, 1 g as a single dose; CHILD > 3 months, 125 mg twice daily, can be doubled in CHILD > 2 years with otitis media; Lyme disease: ADULT and CHILD > 12 years, 500 mg twice daily for 20 days; by IM inj. or IV inj. or infusion, 750 mg every 6-8 hours for mild to moderate infections; increased to 1.5 g every 6-8 hours for severe infections, single doses over 750 mg IV only; CHILD 60-mg/kg daily (range 30-100 mg/kg daily) in 3-4 divided doses; for gonorrhea, 1.5 g as a single dose by IM inj; surgical prophylaxis, 1.5 g by IV inj. at induction of anesthesia, may be supplemented with 750 mg IM inj. 8 and 16 hours later in abdominal, pelvic and orthopedic operations or followed by 750 mg by IM inj. every 8 hours for further 24-48 hours in cardiac, pulmonary, esophageal and vascular surgery

Proprietary Preparations

Adetil *(Supreme),* Susp., 125 mg/5 ml, Tk.198.00/70 ml; Tab., 250 mg, Tk. 15/Tab.; 500 mg, 45.00/Tab.
Adrox *(Ad-din),* Susp. , 125mg/5ml, Tk. 181.00/70mll
Axefur *(Amulet),* Susp., 125 mg/5 ml, Tk. 198.00/70 ml; Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.
Axet *(Orion),* Inj, 250 mg/Vial, Tk. 60.00/Vial; 750 mg/Vial, Tk. 125.47/vial; Susp., 125 mg/5 ml, Tk. 215.81/70 ml; Tab., 125 mg, Tk. 15.06/Tab.; 250 mg, Tk. 25.09/Tab.; 500 mg, Tk. 45.17/Tab.
Axetil *(Alco),* Susp., 125 mg/5 ml, Tk. 190.00/70 ml; Tab., 125 mg, Tk. 12.00/Tab.; 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.
Axim *(Aristo),* Inj., 1.5 gm/Vial, Tk. 200.00/Vial; 750mg/Vial, Tk. 125.00/Vial; Susp., 125 mg/5 ml, Tk. 225.00/70 ml; Tab., 125 mg, Tk. 15.00/Tab.; 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.
Benkill *(Benham),* Tab., 250 mg, Tk. 25.00/Tab.
C2 *(Astra),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.
Cefobac *(Popular),* Inj., 1.5 gm/ Vial, Tk. 200.75/Vial; 750 mg/Vial, Tk. 125.47/Vial; Susp., 125 mg/5 ml, Tk. 198.75/70ml; Tab., 250mg, Tk. 25.09/Tab.; 500 mg, Tk. 45.17/Vial
Cefotil *(Square),* Tab., 125 mg, Tk. 15.05/Tab.; 250mg, Tk. 25.10/Tab.; 500 mg, Tk. 45.16/Tab.; Inj., 750 mg/Vial, Tk. 125.47/Vial; 1.5 gm/Vial, Tk. 200.75/Vial; Susp., 125 mg/5 ml, Tk. 198.74/70 ml
Cefoxil *(Rephco),* Inj., 750 mg/Vial, Tk. 125.00/Vial
Cefuact *(Leon),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.
Cefu-m *(Medimet),* Inj., 750mg, Tk.125.00/Vial;
Cefurim *(Somatec),* Tab. , 250 mg, Tk. 25.10/Tab.; 500mg, Tk. 45.17/Tab.; Susp., 125 mg/5 ml, Tk. 200.00/70 ml
Cefuroxime *(Albion),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Cefuxet *(Chemist),* Tab., 250 mg, Tk. 20.94/Tab.; 500 mg, Tk. 38.00/Tab.; Powder for Suspn., 125 mg/5 ml Tk. 198.00/70 ml; Inj. 750 mg/Vial, Tk. 125.00/Vial
Cerox-A *(ACI),* Tab., 250mg , Tk. 25.09/Tab.; 500mg , Tk. 45.17/Tab.; Inj., 250mg /Vial, Tk. 55.21/Vial; 750mg/Vial, Tk. 125.47/Vial; 1.5 gm/Vial , Tk. 200.75/Vial; Susp., 125 mg/5 ml, Tk. 198.75/70 ml
Ceroxime *(Asiatic),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Famicef *(Acme),* Inj., 1.5 gm/Vial, Tk. 200.75/Vial ;Inj., 750 mg/Vial, Tk. 120.46/Vial
Famicef *(Acme),* Tab., 250 mg, Tk. 25.10/Tab.; 500 mg, Tk. 45.16/Tab.; Susp., 125 mg/5 ml, Tk. 185.69/35 ml; 125 mg/5 ml, Tk.198.74/70ml.
Fixcef *(Navana),* Inj. , 750 mg/Vial, Tk. 125.00/Vial; 1.5 gm/Vial , Tk. 200.00/Vial; Susp., 125 mg/5 ml, Tk. 190.00/70 ml; Tab., 250 mg, Tk. 25.00/Tab.
Furex *(Drug Intl),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.; Susp., 125

mg/5 ml, Tk. 225.00/70 ml; Inj., 250 mg/Vial, Tk. 50.00/Vial; 750mg/Vial, Tk. 125.00/Vial; 1.50 gm/Vial, Tk. 200.00/Vial
Furocef *(Renata),* Tab., 125 mg, Tk. 15.06/Tab.; 250mg, Tk. 25.09/Tab.; 500 mg, Tk. 45.17/Tab.; Susp., 125 mg/5 ml, Tk. 198.75/70 ml; Inj., 250 mg/Vial, Tk. 55.21/Vial; 750 mg/Vial, Tk. 125.47/Vial; 1.50 gm/Vial, Tk. 200.75/Vial
Furotec *(APC),* Tab., 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Furotil *(Healthcare),* Tab., 125 mg, Tk. 15.00/Tab.; 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Inj., Susp., 125 mg/5 ml, Tk. 200.00/70 ml; 750 mg/Vial, Tk. 175.00/Vial; Inj., 1.5 gm/Vial, Tk. 275.00/Vial
Furotixol *(Sharif),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Fuxtil *(Pharmasia),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Kfore *(Kemiko),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 270.00/70 ml
Kilbac *(Incepta),* Tab. , 125 mg, Tk. 15.00/Tab.; 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml; 250 mg/5 ml, Tk. 250.00/50 ml; Inj., 250 mg/Vial, Tk. 55.00/Vial; 750 mg/Vial, Tk. 125.00/Vial; 1.5 gm/Vial, Tk. 200.00/Vial
Kilmax *(Eskayef),* Tab, 125 mg, Tk. 15.00/Tab.; 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml; Inj., 750 mg/Vial, Tk. 125.00/Vial; 1.5 gm/Vial, Tk. 200.00/Vial
Lepath *(Amico),* Tab. , 250 mg, Tk. 22.00/Tab.
Maxil *(Biopharma),* Susp., 125 mg/5 ml, Tk. 200.75/70ml; 250 mg/5 ml, Tk. 250.94/50 ml
Merocef *(Ibn Sina),* Inj., 750 mg/Vial, Tk. 130.00/Vial, Susp., 125 mg/5 ml, Tk. 200.00/70 ml; Tab., 250 mg, Tk. 26.00/Tab.; 500 mg, Tk. 46.00/Tab.
Mextil*(Biopharma),* Tab., 125 mg, Tk. 15.06/Tab.; 250 mg, Tk. 25.09/Tab.; 500 mg, Tk. 45.17/Tab.; Inj., 250 mg/Vial, Tk. 55.00/Vial; 750 mg/Vial, Tk. 125.00/Vial; 1.5 gm/Vial, Tk. 200.00/Vial
Picocef *(Concord),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.; Susp.,125 mg/5ml, Tk. 198.00/70ml
Recofast *(Rangs),* Tab., 125mg, Tk. 15.00/Tab.; 250mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.; Inj., 750mg, Tk. 125.00/Vial; Susp., 125mg/5ml,Tk. 198/70 ml
Rofurox *(Radiant),* Tab., 250 mg, Tk. 35.00/Tab.; 500mg, Tk. 55.00/Tab.; Susp., 125 mg/5 ml, Tk. 270.00/70 ml; Inj., 750 mg/Vial, Tk. 200.00/Vial
Roxcef *(Nipro JMI),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.
Roxibac *(RAK),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.
Roxicil *(Pharmacil),* Tab. , 250 mg, Tk. 30.00/Tab.; 500 mg, Tk. 50.00/Tab.; Inj., 750 mg/Vial, Tk. 170.00/Vial.
Roxilab *(Labaid),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 50.00/Tab.; Susp.,125 mg/5ml,Tk. 270.00/70 ml
Roximax *(Veritas),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.
Secomax *(General),* Tab., 250 mg, Tk. 25.09/Tab.; 500 mg, Tk. 45.47/Tab.; Susp., 125 mg/5 ml, Tk. 200.75/70 ml
Sefatil *(Pacific),* Tab., 125 mg, Tk. 11.28/Tab.; 250 mg, Tk. 18.80/Tab.; 500 mg, Tk. 33.83/Tab.;Susp.,125 mg/5 ml,Tk.112.78/70ml
Sefur *(Opsonin),* Tab., 125 mg, Tk. 11.32/Tab.; 250mg, Tk. 18.86/Tab.; 500 mg, Tk. 33.96/Tab.; Susp., 125mg/5 ml, Tk. 149.44/70 ml; 250 mg/5 ml, Tk. 188.68/50 ml; Inj., 750 mg/Vial, Tk. 94.34/Vial; 1.5gm/Vial, Tk. 150.94/Vial
Sefurox *(Sanofi),* Tab., 125mg, Tk. 15.06/Tab.; 250mg, Tk. 25.09/Tab.; 500mg, Tk. 45.17/Tab.; Susp., 125 mg/5 ml, Tk. 198.74/70 ml; Inj., 750mg/Vial, Tk. 125.47/Vial; 1.5 gm/Vial, Tk. 200.00/Vial
Staxim *(Delta),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 170.00/70 ml
Til *(Apex),* Tab. , 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Turbocef *(Beximco),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 210.00/70 ml; Inj., 750 mg/Vial, Tk. 125.00/Vial; 1.5 gm/Vial, Tk. 200.00/Vial
Vexotil *(Organic),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Winfax *(White Horse),* Tab. , 500 mg, Tk. 360.00/Tab.; Susp., 125 mg/5 ml, Tk. 198.00/70 ml
Xefrim *(Beacon),* Tab., 250 mg, Tk. 25/Tab.; Susp.,125 mg/5 ml, Tk.197.99/70 ml
Ximetil *(Globe),* Susp., 125 mg/5 ml, Tk. 198.00/70 ml; Inj., 1.5 gm/vial, Tk. 200.00/Vial; 750 mg / vial, Tk. 125.00/Vial; Tab., 500 mg, Tk. 45.00/Tab.; 250 mg, Tk. 25.00/Tab.
Xitil *(Ziska),* Tab., 250mg, Tk. 25.00/Tab.; 500mg, Tk. 45.00/Tab.; Susp., 125mg/5ml, Tk. 198.00/70ml
Xorimax *(Novartis),* Tab., 250 mg, Tk. 30.00/Tab.; 500mg, Tk. 55.00/Tab.; Susp., 125 mg/5 ml, Tk. 250.00/70 ml
Xtil *(MST),* Tab., 250 mg, TK. 25/Tab.; 500 mg, TK. 45/Tab.
Zinnat *(GSK.),* Tab. , 125 mg, Tk. 13.20/Tab.; 250 mg, Tk. 22.00/Tab.; 500 mg, Tk. 554.12/Tab.

(Cefuroxime +Clavulanic Acid)
Calvuxet *(Leon),* Tab., 250mg + 62.5mg, Tk. 30.00/Tab.
Cefaclav *(Incepta),* Susp., 125 mg + 31.25 mg/5ml, Tk. 250.00/70 ml; Tab., 125 mg + 31.25 mg, Tk. 18.00/Tab.; 250 mg + 62.50 mg, Tk. 30.00/Tab.; 500 mg + 125 mg, Tk. 50.00/Tab.;
Cefurim CV *(Somatec),* Tab., 250mg+62.5mg, Tk. 30.00/Tab.; 500 mg + 125 mg, Tk. 50/Tab.
Cerox-CV *(ACI),* Tab. , 125mg + 31.25mg, Tk.21.00/Tab.; 250mg + 62.5mg, Tk. 30.00/Tab.; 500mg + 125mg, Tk. 50.00/Tab.
Clavusef *(Opsonin),* Susp., 125 mg + 31.25 mg/5ml, Tk. 189.47/70 ml; 125 mg + 31.25 mg, Tk. 13.53/Tab.; 250mg + 62.5mg, Tk. 22.56/Tab.; 500 mg + 125 mg, Tk. 37.59/Tab.
Fuclav*(Drug Intl),* Susp., 125 mg + 31.25 mg/5ml, Tk. 250.00/70 ml; Tab., 125 mg + 31.25 mg, Tk.18.00/Tab.; 250 mg + 62.50 mg, Tk. 30.00/Tab.; 500 mg + 125 mg, Tk. 50/Tab.
Furoclav *(Renata),* Tab., 250 mg + 62.50 mg, Tk. 30.00/Tab.; 500 mg + 125 mg, Tk. 50.00/Tab.
Kefuclav *(Eskayef),* Tab., 250 mg + 62.50 mg, Tk. 30.00/Tab.; 500 mg + 125 mg, Tk. 50/Tab.
Xiclav *(Ziska),* Tab., 250 mg+62.5 mg, Tk. 30.00/Tab. ; 500 mg+125 mg, Tk. 50.00/Tab.; susp., 2.5 gm + 0.625 gm/100 ml, Tk. 250.00/70ml
Ximeclav *(Globe),* Tab., 125 mg + 21.25 mg, Tk. 18.00/Tab.; 250 mg + 62.50 mg, Tk. 30.00/Tab.; 500 mg + 125 mg, Tk. 50.00/Tab.

1.1.2.3 THIRD-GENERATION CEPHALOSPORINS

Third generation agents (**cefotaxime, ceftriaxone, ceftibuten** etc.) generally are less active than first generation drugs against gram-positive cocci, but they are much more active against the *Enterobacteriaceae,* including beta-lactamase producing strains. Among third generation drugs ceftazidime and cefoperazone also are effective in *P. aeruginosa* infection but are less active than other third generation agents against gram-positive cocci.

CEFDINIR

Indications: gonorrhea, otitis media, pharyngitis, lower RTI such as bronchitis and UTI

Caution: renal Impairment

Side effects: *see under Cefadroxil*

Interactions: *see Appendix-2*

Dose: *oral:* ADULT, 600 mg daily as a single dose on in two divided doses CHILD may be given 14 mg/kg body weight daily

Proprietary Preparations
Adinir *(Acme),* Susp., 125 mg/5 ml, Tk. 175.66/60 ml; Cap., 300 mg, Tk. 45.16/Cap.
Cefexta *(Unimed),* Susp., 125 mg/5 ml, Tk. 225.00/60 ml; Cap., 300 mg, Tk. 57.00/Cap.
Cefexta forte *(Unimed),* Susp., 125 mg/5 ml, Tk. 210.00/30ml
Efdinir *(Incepta),* Susp., 125 mg/5 ml, Tk. 175.00/60 ml; Cap., 300 mg, Tk. 45.00/Cap.

CEFDITOREN

Indications: sinusitis, otitis media, skin and soft tissue infections caused by *Enterobacteriaceae* and *betalactamase* producing *H. influenzae, Morexella catarrhalis and N. gonorrhea*
Cautions: *see under Cefadroxil*; also carnitine deficiency
Contra-indications: *see under Cefadroxil*
Interactions: *see Appendix -2*
Side-effects: *see under Cefadroxil*
Dose: *oral*: ADULT and CHILD > 10 years: 200-400 mg twice daily; in patients with renal insufficiency: creatinine clearance (CC) < 30ml/min, 200 mg once daily, CC 30-49 ml/min, 200 mg twice daily

Proprietary Preparation
Cefditor *(Orion),* Tab. 200 mg, Tk.150/Tab.

CEFETAMET PIVOXIL HCl

This member of third-generation cephalosporins has therapeutic profile similar to that of cefixime. However, it may precipitate carnitine deficiency.
The usual administration is per oral in a dose of 500 mg twice daily.

Proprietary Preparation
Tenafet *(Incepta)*, Tab., 250mg, Tk.20/Tab; 500mg, Tk.35/Tab.; Susp., 250mg/5ml, Tk.120/50 ml

CEFIXIME

Indications: sinusitis, otitis media, skin and soft tissue infections caused by *Enterobacteriaceae* and *betalactamase producing H. influenzae, Morexella catarrhalis and N. gonorrhea*
Cautions, Contra-indications: *see under Cefadroxil*
Interactions: *see Appendix -2*
Side-effects: *see under Cefadroxil*
Dose: *oral*: ADULT and CHILD > 10 years: 200-400 mg twice/once daily; CHILD > 6 months: 8 mg/kg daily in 1-2 divided doses

Proprietary Preparations

3rd cef *(Medimet),* Susp., 5mg/5ml, Tk.160.00/50ml; Tk.130.00/37.5ml; 400mg, Tk.50.00/Tab.; 200mg, Tk.27.00/Tab.
Adexim *(Supreme),* Cap. 200 mg, Tk. 35/Cap.; Susp., 100 mg/5 ml, Tk.180/50 ml
Afix *(Aristo),* Cap., 200 mg, Tk. 35/Cap.; 400mg, Tk. 50/Cap.; Susp., 200 mg/5 ml, Tk. 195/30 ml; Tk. 280/50 ml; 100 mg/5ml, Tk. 120/30 ml; Tk. 195/50 ml; Tab. 200 mg, Tk. 35/Tab.; 400 mg, Tk. 50/Tab.
Afixime *(Asiatic),* Susp., 100 mg/5 ml, Tk.130.00/37.5ml; Tk. 160.00/50 ml; Cap. 200mg, Tk. 30.00/Cap.; 400 mg, Tk. 50/Cap.
Amucef *(Amulet),* Cap. 200 mg, Tk. 30.00/Cap.; 400mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 195.00/50 ml
Antima *(Jayson),* Cap. 200 mg, Tk. 30/Cap.; 400mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 185.00/50ml
Bestcef *(Biopharma),* Cap. 200 mg, Tk. 35.00/Cap.; Cap. 400 mg, Tk. 50.19/Cap.; Susp., 100 mg/5 ml, Tk. 130.49/37.5 ml; Tk. 195.74/50 ml
Bioxim *(Sharif),* Susp., 100 mg/5 ml, Tk. 120.00/30 ml; Tk. 160.00/50 ml; Cap. 200 mg, Tk. 30.00/Cap.; 400mg, Tk. 50.00/Cap.
C-3 *(Astra),* Susp., 100 mg/5 ml, Tk.195/50ml; Cap. 200 mg, Tk. 30.00/Cap.
Cef-3 *(Square),* Cap. 200mg,Tk.35.00/Cap.; 400mg, Tk.50.20/Cap.; Susp., 100mg/5ml, Tk. 135.00/30ml; Tk. 170.00/40ml; Tk. 210/50ml; 200mg/5ml, Tk. 280.00/50ml; Tab., 200mg, Tk. 35.00/Tab.; 400mg, Tk. 50.00/Tab.
Cefcil *(Pharmacil),* Paed. drops, 125 mg/5 ml, Tk. 200.00/50 ml; Cap., 200 mg, Tk. 34/Cap.
Cefesta *(APC),* Cap., 200 mg, Tk. 30/Cap.; Susp., 100 mg/5 ml, Tk. 160/50 ml
Cefim-3 *(ACI),* Cap. , 200 mg , Tk. 30.00/Cap.; 400 mg, Tk. 50.19 /Cap.; Susp., 200 mg/5 ml , Tk. 280.00/50 ml; 100 mg/5 ml, Tk. 120.45/30 ml; Tk. 195.00/50 ml; Tk. 240.90/75 ml; Tk. 130.00/30 ml;
Cefix *(Globe),* Susp., 100 mg/5 ml, Tk. 195.00/50 ml; Cap., 400 mg, Tk. 50.00/Cap.; 200 mg, Tk. 30.00/Cap.
Cefixim *(Ibn Sina),* Susp., 100 mg/5 ml, Tk. 150.00/40ml; Tk. 200.00/50 ml; 200 mg/5 ml, Tk. 280.00/50 ml; Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 55.00/Cap.
Cefixime *(Albion),* Cap., 200 mg, Tk. 30/Cap.; 400mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 120/30ml; Tk.160/50 ml; Tk.310/100ml
Cefixime-A *(Ad-din),*Susp. , 100mg/5ml, Tk. 160.00/50 ml; Cap., 200mg, Tk. 25.00/Cap.
Cef-plus *(Hudson),* Cap., 200mg, Tk.28.00/Cap.; Susp., 100mg/5ml, Tk.170.00/50 ml
Ceftid *(Opsonin),* Susp., 100 mg/5 ml, Tk. 98.11/30 ml; Tk. 147.17/50 ml; 200 mg/5 ml, Tk. 241.51/50 ml; Tab., 200 mg, Tk. 26.32/Tab.; 400 mg, Tk. 37.74/Tab.; Cap., 200 mg, Tk. 26.32/Cap.; 400 mg, Tk. 37.74/Cap.; Paed. drops, 125 mg/5 ml, Tk. 73.68/21 ml;
Cemak *(Maks),* Cap., 200 mg, Tk. 30.00/Cap.
Cephoral *(Labaid),* Susp., 100 mg/5 ml, Tk. 200.00/50ml; Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 55.00/Cap.
Cexime *(GSK),* Susp., 100 mg/5 ml, Tk. 172.19/50ml; Cap., 200 mg, Tk. 431.12/Cap.; 400 mg, Tk. 307.86/Cap.
Denvar *(Healthcare),* Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 195.00/50 ml; 200 mg/5 ml, Tk. 225.00/50 ml
Duracef *(Navana),* Cap., 400 mg,Tk. 50/Cap.; Susp., 200 mg/5 ml, Tk. 120.44/30 ml; Tk. 180.00/50ml; Tk. 280.00/50 ml
Emixef *(Incepta),* Cap., 200 mg , Tk. 35/Cap.; 400mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk.130.00/30 ml; Tk. 170.00/40 ml; Tk. 195.00/50 ml; 200mg/5 ml, Tk. 280.00/50 ml
Excef *(Chemist),* Cap. , 200 mg, Tk. 25.00/Cap.; Susp., 50 ml, Tk. 175.00/50 ml
Exibe *(Benham),* Cap., 200 mg, Tk. 30/Cap.; Susp., 100 mg/5 ml, Tk. 195/50 ml
Fix-A *(Acme),* Cap., 200 mg, Tk. 30.11/Cap.; 400 mg, Tk. 50.20/Cap.; Paed. Drop, 125 mg/5 ml, Tk. 130.49/37.5 ml; Susp. 100 mg/5 ml, Tk. 280.00/50 ml;
Fixbac *(RAK),* Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 140/30 ml; Tk. 200/50 ml
Fixpro *(Nipro JMI),* Cap., 200 mg, Tk. 30.12/Cap.; 400mg, Tk. 50.19/Cap.; Susp., 100 mg/5 ml, Tk. 195.74/50ml
G-Ccfixime *(Gonoshasthaya),* Susp.,100mg/5 ml, Tk. 130.00/50 ml; Cap., 200 mg, Tk.20.00/Cap.
Gen-3 *(Amico),* Susp., 100 mg/5 ml, Tk. 175.00/50ml; Cap., 200 mg, Tk. 30.00/Cap.
Kefim *(Kemiko),* Susp., 100 mg/5 ml, Tk. 130.00/37.5ml; Tk. 195.00/50 ml; Cap. 200 mg, Tk. 30.00/Cap.; 400 mg, Tk. 55.00/Cap.

Keor *(Rephco),* Cap., 200 mg, Tk. 30.00/Cap.; 400mg , Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 160.00/50 ml
Kuracef *(Sanofi),* Tab., 200 mg, Tk. 30.11/Tab.; 400mg, Tk. 50.19/Tab.; Susp., 100 mg/5 ml, Tk. 120.00/30 ml; Tk. 195.74/50 ml
Loxim *(Techno),* Tab., 200 mg, Tk. 40.00/Tab.; 400mg, Tk. 45.00/Tab.; Susp., 100 mg/5 ml, Tk. 250.00/50 ml
Microcef *(Concord),* Susp., 100 mg/5 ml, Tk. 130.00/30ml; Tk. 195.00/50 ml; Cap., 200 mg, Tk. 30.00/Cap.; 400 mg, Tk. 50.00/Cap.
Ngcef *(Rangs),* Susp., 100mg/5ml, Tk. 195.00/50 ml; Cap., 200mg, Tk.30.00/Cap.
Odacef *(Unimed),* Susp., 100 mg/5 ml, Tk. 120.00/30 ml.; Tk. 195.00/50 ml; Cap., 200 mg, Tk. 30.00/Cap.; 400 mg, Tk. 50.00/Cap.
Ofex *(Delta),* Cap., 200 mg, Tk. 25.00/Cap.; 400mg, Tk. 40.00/Cap.; Susp., 100 mg/5 ml, Tk. 170.00/50 ml
Orcef *(Renata),* Susp., 100 mg/5 ml, Tk. 135.51/30 ml; Tk. 155.58/40 ml; Tk. 195.74/50 ml; Tk. 225.00/70 ml; Cap., 200 mg , Tk. 30.11/Cap.; Tab., 200 mg, Tk. 30.11/Tab.; 400 mg, Tk. 50.00/Tab.
Orgaxim *(Organic),* Susp., 100 mg/5 ml, Tk. 195.00/50ml; Tk. 240.00/75 ml; Cap., 200 mg, Tk. 30.00/Cap.; 400 mg, Tk. 50.00/Cap.
Polyxim *(Leon),* Susp., 100 mg/5 ml, Tk. 195.00/50 ml; Cap., 200 mg, Tk. 35.00/Cap.
Prexim *(Ziska),* Susp., 100mg/5ml, Tk. 120.00/30ml; Tk.160.00/50ml; Cap., 200mg, Tk. 30.00/Cap.; 400mg, Tk. 45.00/Cap.
Rofixim *(Radiant),* Susp., 100 mg/5 ml, Tk. 200.00/50ml; Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 55.00/Cap.
Roxim *(Eskayef),* Cap, 200mg, Tk.35.00/Cap.; 400mg, Tk.50.00/Cap.; 100mg/5ml, Tk.130.00/30ml; Tk.195.00/50ml; 100mg/5ml, Tk.225.00/75ml; 200mg/5ml, Tk.320.00/60ml; Tab., 200mg, Tk.30.00/Tab.; 400mg, Tk.50.00/Tab.
Saver *(Alco),* Susp., 100 mg/5 ml, Tk. 120.00/30 ml; Tk. 195.00/50 ml; Cap., 200 mg, Tk. 30.00/Cap.; 400mg, Tk. 50.00/Cap.
Setic *(Novartis),* Susp., 100 mg/5 ml, Tk. 200.00/50 ml; Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 55.00/Cap.
Starcef *(Beacon),* Susp., 100 mg/5 ml, Tk. 195.00/50ml; Cap., 200 mg, Tk. 35.00/Cap.;
T-Ccf *(Drug Intl),* Cap., 200 mg, Tk. 30.00/Cap.; 400mg, Tk. 50.00/Cap.; Susp. 100 mg/5 ml, Tk. 135.00/30 ml; Tk. 195.00/50 ml; 200mg/5ml, Tk. 280.00/50ml; Paed. drop, 125 mg/5 ml, Tk. 100.00/21ml;
Texit *(Apex),* Cap. , 200 mg, Tk. 30.00/Cap.; 400 mg, Tk. 50.00/Cap.; Susp., 100 mg/ 5 ml, Tk. 180.00/50 ml; Tk. 250.00/100 ml
Tgocef *(Somatec),* Susp., 100 mg/5 ml, Tk. 130.00/30ml; 195.00/50 ml; Cap., 200 mg, Tk. 25.10/Cap.; 400 mg, Tk. 45.17/Cap.
Tocef *(General),* Susp., 100mg/5ml, Tk. 130.49/37.5ml; Tk. 195.74/50 ml; Cap., 200 mg, Tk. 30.11/Cap.; 400 mg, Tk. 50.19/Cap.
Topxim *(Bios),* Susp., 100 mg/5 ml, Tk. 158.00/50 ml; Cap., 200 mg, Tk. 24.50/Cap.
Tricef *(Ambee) ,* Susp. , 100 mg/5ml , Tk. 160.61/50 ml; Cap., 200 mg , Tk. 25.1/Cap
Trifix *(Pacific),* Cap., 200 mg, Tk. 26.32/Cap.; Susp., 100 mg/5 ml, Tk. 112.78/50 ml
Triocim *(Beximco),* Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 195.00/50ml; 200 mg/5 ml, Tk. 320.00/50 ml
Truso *(Orion),* Cap., 200 mg, Tk. 35.00/Cap.; 400 mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 130.49/37.50 ml; Tk. 195.00/50 ml; 200 mg/5 ml, Tk. 280/50 ml
Tyfax *(White Horse),* Susp., 100 mg/5 ml, Tk. 195.74/50 ml; Cap., 200 mg, Tk. 300/Cap.; 400 mg, Tk. 50.00/Cap.
Unifix *(MST),* Cap., 200 mg, TK. 30/Cap.; 400 mg, TK. 50 / Cap.; Susp., 100 mg/5 ml, TK. 160 / 50 ml; 200 mg/5 ml, TK. 280/50 ml
Velofix *(Pharmasia),* Cap., 200 mg, Tk. 30.00/Cap.; 400 mg, Tk. 50.00/Cap.; Susp., 100 mg/5 ml, Tk. 195.00/37.5 ml ;DS Susp., 200 mg/5 ml, Tk. 228.85/37.5 ml
Verixim *(Veritas),* Cap., 200 mg, Tk. 30/Cap.; Susp., 100 mg/5 ml, Tk. 195/50 ml
Zemicef *(Popular),* Tab., 200 mg, Tk. 30.11/Tab.; 400mg, Tk. 50.19/Tab.; Susp. 100 mg/5 ml, Tk. 120.45/30ml; Tk.150.57/40ml; Tk. 195.74/50ml; 200 mg/5 ml, Tk. 321.21/50ml

CEFOTAXIME

Indications: as part of 3-drug combination with vancomycin and ampicillin in meningitis due to *H. influenzae,* penicillin-sensitive *S. pneumonia, N. meningitidis* and gram-negative enteric bacteria, gonorrhea, *Hemophilus epiglottitis; also see under cefadroxil*
Cautions, Contraindications: *see under cefadroxil*

Interactions: *see Appendix-2*
Side-effects: rare events of cardiac arrhythmias after rapid inj. also see under cefadroxil
Dose : *by IM or slow IV inj. or IV infusion* 1 g every 12 hours for mild to moderate infections; increased to 8 g daily in 4 divided doses for severe meningitis, up to a max. of 12 g daily in 3-4 divided doses; CHILD 100-150 mg/kg/day in 2 to 4 divided doses in mild to moderate

infections, increased to 200 mg/kg daily in severe infections; NEONATES 50 mg/kg/day in 2 to 4 divided doses for mild to moderate infections; increased to 150-200 mg/kg/day 4 divided doses for severe infections; for gonorrhea, a single dose of 500 mg

Proprietary Preparations

Cefot *(ACI),* Inj.,1 gm/Vial, Tk. 132.00/Vial; 250 mg/Vial;Tk. 50.00/Vial;2 gm/Vial,Tk. 250.00/Vial;500 mg/Vial,Tk. 76.00/Vial
Cefotax *(Renata,),* Inj.,1 gm/Vial,Tk. 180.00/Vial;250 mg/Vial, Tk. 75.00/Vial **;** 500 mg/Vial, Tk. 100.00/Vial
Cefotime *(Incepta),* Inj.,1 gm/Vial, Tk. 132.00/Vial;250 mg/Vial, Tk. 50.00/Vial ; 500 mg/Vial, Tk. 76.00/Vial
Ceftax *(Opsonin),* Inj.,1 gm/Vial, Tk. 99.62/Vial;250 mg/Vial, Tk. 37.74/Vial; 500 mg/Vial, Tk. 57.36/Vial
Cetaxim *(Globe),* Inj. 1 gm, Tk. 130.00/Vial; 500 mg/vial, Tk. 76.00/Vial
Maxcef *(Square),* Inj.,1 gm/Vial, Tk. 140.00/Vial ;,250 mg/Vial,Tk. 70.00/Vial ; 500 mg/Vial, Tk. 90.00/Vial
Taxceph *(Ibn Sina),* Inj.,1 gm/Vial, Tk. 140.00/Vial;250 mg/Vial, Tk. 52.00/Vial ;500 mg/Vial,Tk. 76.00/Vial
Taxim *(Acme),* Inj.,1 gm/Vial, Tk. 150.00/Vial;250 mg/Vial,Tk. 75.00/Vial;500 mg/Vial, Tk. 100.00/Vial
Torped *(Orion),* Inj.,1 gm/Vial, Tk. 130.49/Vial; 250 mg/Vial, Tk. 50.19/Vial; 500 mg/Vial, Tk. 75.28/Vial

CEFPODOXIME

Indications: upper respiratory-tract infections, particularly those that are recurrent and resistant to other antibiotics; lower respiratory-tract infections including bronchitis and pneumonia; skin and soft tissue infections; uncomplicated UTI and gonorrhea; also effective against penicillin-resistant strains of *Streptococcus pneumonia*
Caution, Contraindications and **Side-effects:** *see under cefadroxil*
Interactions: *see Appendix -2*
Dose*: oral:* as cefpodoxime proxetil: upper respiratory-tract infections (in pharyngitis and tonsillitis only in infections which are recurrent, chronic, or resistant to other antibacterial), 100 mg twice daily, 200 mg twice daily in sinusitis; lower respiratory tract infections including bronchitis and pneumonia, 100-200 mg twice daily; skin and soft tissue infections, 200 mg twice daily; uncomplicated urinary-tract infections, 100-200 mg twice daily; uncomplicated gonorrhea, 200 mg as a single dose; CHILD 15 days-6 months 4 mg/kg every 12 hours; 6 months-2 years 40 mg every 12 hours; 3-8 years 80 mg every 12 hours; > 9 years 100 mg every 12 hours

Proprietary Preparations

Cedofax *(White Horse),* Cap. , 100 mg, Tk. 17.00//Cap**;** 200 mg,Tk. 28.00/Cap.
Cefdox *(ACI),* Susp,40mg/5ml, Tk. 98.37/50ml
Cefipod *(Asiatic),* Cap.,100 mg, Tk. 14.00/Cap.;Cap., 200 mg, Tk. 25.00/Cap.;Susp, 80 mg/5 ml, Tk. 175.00/50 ml **,** Susp, 40 mg/5 ml, Tk. 98.00/50 ml *,* Paed. drop, 20 mg/ml, Tk. 60.00/15 ml
Cefobid *(Unimed),* Cap. , 200 mg, Tk. 42.00/Cap.;Susp, 40 mg/5 ml, Tk. 98/50 ml
Cefodim *(Pacific),* Cap., 100 mg, Tk. 16.54/Cap.; 200 mg, Tk. 30.08/Cap.; Susp, 40 mg/5 ml, Tk. 60.15/50 ml
Cefomin *(Popular),* Susp., 80 mg/5 ml, Tk. 96.36/50ml;Tab., 100 mg , Tk. 20.08/Tab.**;** 200 mg, Tk. 38.14/Tab.
Cefoprox *(Leon),* Susp., 40 mg/5 ml, Tk. 98.00/50 ml
Ceforan *(Drug Intl),* Tab.,100 mg, Tk. 17.00/Tab., 200 mg,Tk. 28.00/Tab.;Susp, 40 mg/5 ml,Tk. 120.00/100 ml;Tk. 75.00/50 ml;80 mg/5 ml,Tk. 175.00/50 ml
Cefpodoxime *(Albion),* Paed. drops, 20 mg/ml, Tk. 60.00/15 ml; Susp, 80 mg/5 ml, Tk. 98.00/50 ml
Cefpox *(Albion),* Cap. ,100 mg, Tk. 22.00/Cap. ;200 mg, Tk. 42.00/Cap.
Cepdoxim *(Alco),* Cap. , 100 mg, Tk. 20.00/Cap; 200 mg, Tk. 30.00/Cap. ;Susp, 40 mg/5 ml, Tk. 90.00/50 ml *,* 40 mg/5 ml, Tk. 175.00/100 ml
Cepoxid *(Apex),* Susp, 40 mg/5 ml, Tk. 98.00/50 ml
CP *(Acme),* Tab., 200 mg, Tk. 42.16/Tab.;Paed. drops, 20 mg/ml, Tk. 60.22/15 ml; Susp., 80 mg/5 ml, Tk. 98.36/50 ml; 80 mg/5 ml, Tk. 175.00/50 ml
Desbac *(General),* Cap., 100 mg, Tk. 22.06/Cap.; Susp., 80 mg/5 ml, Tk. 98.37/50ml
Dofixim, *(Ibn Sina),* Cap.,100 mg, Tk. 21.00/Cap; Susp., 40 mg/5 ml,Tk. 100/50 ml
Instina *(Ziska),* Susp., 40mg/5ml, Tk. 98/50ml
Kidcef*(Beacon),* Susp., 40 mg/5 ml,Tk. 98.00/50 ml
Leprox*(Amico),* Susp., 40 mg/5 ml, Tk. 98.00/50 ml ; 80 mg/5 ml,Tk. 175.00/50 ml

Neoprox *(Somatec),* Paed. drops, 20mg/ ml ,Tk. 60.23/15 ml ;Susp, 40 mg/5 ml, Tk. 98.37/50 ml
Pedicef *(Orion),* Paed. drops, 20 mg/ ml, Tk. 60.23/15 ml ; Susp., 80 mg/5 ml, Tk. 175.66/50 ml; 40 mg/5 ml, Tk. 98.37/50 ml
Podo*(Kemiko),* Susp., 40 mg/5 ml, Tk.98/50ml
Podoxi*(Chemist),* Susp.,40mg/5ml,Tk.90/50ml
Rovantin *(Opsonin),* Tab.,100 mg, Tk.10.56/Tab.; 200 mg,Tk. 18.86/Tab.;Susp, 80 mg/5 ml, Tk. 132.08/50 ml; 40 mg/5 ml, Tk. 73.96/50 mlPaed. drop, 20 mg/ml, Tk. 45.29/15 ml;
Roxetol *(Healthcare),*Susp., 80 mg/5 ml, Tk. 95.00/50 ml
Sarelox *(Sanofi),*Tab.,100 mg, Tk. 22.08/Tab.,Tab., 200 mg, Tk. 42.16/Tab.; Susp.,80 mg/5 ml,Tk. 175.66/50 ml; 40 mg/5 ml, Tk. 98.37/50 ml Paed.drop, 20 mg/ml, Tk. 60.23/15 ml
Sefox *(Navana),* Cap., 100mg,Tk. 2.08/Cap; Susp., 80 mg/5 ml, Tk.95.35/50 ml
Starin *(Eskayef),* Cap, 100 mg, Tk. 22/Cap.;Paed. drop, 20 mg/ml, Tk. 60/15 ml; Susp., 40 mg/5 ml, Tk. 98/50 ml; 80 mg/5ml, Tk. 150/50 ml
Taxetil *(Aristo),* Cap. , 100 mg, Tk. 22.00/Cap.; 200 mg, Tk. 40.00/Cap. ;Susp.,80 mg/5 ml, Tk. 175.00/50 ;40 mg/5 ml, Tk. 195.00/100 ml;Paed. drop, 20 mg/ml, Tk. 62.00/15 ml ;Tk. 99.00/50 ml
Toraxim *(Delta),* Paed. drop, 20 mg/ml, ml , Tk. 60/15 ml ; Susp.,40 mg/5 ml,Tk. 98/50ml
Trucef *(Renata),* Tab. ,100 mg, Tk. 22.08/Tab.; Paed. drop, 20 mg/ml,, Tk. 60.23/15 ml
Trucef *(Renata),* Tab. , 200 mg, Tk. 42.16/Tab.;Susp., 80 mg/5 ml, Tk. 175.66/50 ml; Tk. 98.37/50 ml; 40 mg/5 ml, Tk. 190.72/100 ml;
Vanprox *(Square),* Cap.,100 mg, Tk. 22.08/Cap;. , 200 mg, Tk. 42.16/Cap.; Paed. drop, 20 mg/ml, Tk. 60.22/15 ml; Susp., 40 mg/5 ml, Tk. 98.36/50ml ;80 mg/5 ml, Tk. 175.66/50 ml
Vercef *(Beximco,),* Paed. drops, 20 mg/ml,, Tk. 60.00/15 ml ; Susp., 40 mg/5 ml, Tk. 98.00/50 ml ;80 mg/5 ml, Tk. 175.00/50 ml
Xepodox *(Rangs),* Susp., 20mg/ml, Tk. 60.00/15 ml; 40mg/5ml, Tk. 98.00/50 ml
Ximeprox *(Incepta),* Tab. , 100 mg, Tk. 17.00/Tab.;200 mg, Tk.28.00/Tab.;Susp., 80 mg/5 ml, Tk. 175.00/50ml; 40 mg/5 ml,Tk. 98.00/50ml ;Tk. 195.00/100 ml ;Paed. drop, 20 mg/ml, Tk. 60.00/15 ml;
Zedoxim *(Globe),* Ped., drops , 20 mg/ml, Tk. 60.00/15 ml; Susp., 40 mg/5 ml, Tk. 95.00/50 ml; Cap., 200 mg, Tk. 40.00/Cap.; 100 mg, Tk. 20.00/Cap.

Cefpodoxime + Clavulanic Acid
Duo-5 LS *(Incepta),* Tab. 100 mg + 62.50 mg, Tk. 25.00/Tab.
Xtabac *(Opsonin),* Tab. 200 mg + 125 mg, Tk. 26.32/Tab.; 100 mg + 62.50 mg, Tk. 15.04/Tab.

CEFTAZIDIME

Indications: with an aminoglycoside treatment of choice for *Pseudomonus meningitis*, surgical prophylaxis, *also see under Cefixime*
Cautions, Contra-indications, Side-effects:
see under Cefadroxil
Interactions: *see Appendix-2*
Dose: *IM or slow IV inj. or IV infusion:* 1 g every 8 hours for mild to moderate infections, increased to 2 g every 8-12 hours for severe infections, single dose over 1 g IV route only, up to a max. of 3 g daily; CHILD up to 2 months 25-60 mg/kg daily in 2 divided doses, > 2 months 30-100 mg/kg daily in 2-3 divided doses; up to 150 mg/kg daily in 3 divided doses (max. 6 g daily) if immunocompromised or meningitis; IV route recommended for children; urinary tract and less serious infections: 0.5-1 g every 12 hours; *Pseudomonal lung infection in cystic fibrosis*: ADULT with normal renal function 100-150 mg/kg daily in 3 divided doses; CHILD up to 150 mg/kg daily (max. 6 g daily) in 3 divided doses; IV route recommended for children; surgical prophylaxis, prostatic surgery, 1 g at induction of anesthesia repeated if necessary when catheter removed

Proprietary Preparations
Cefazid *(Renata),* Inj., 1 gm/Vial, Tk. 240.00/Vial ; 250 mg/Vial, Tk. 85.00/Vial; 500 mg/Vial, Tk.130.00/Vial
Ceftazim *(Aristo),*Inj., 1 gm/Vial, Tk. 220.00/Vial ; 250 mg/Vial, Tk. 75.00/Vial ; 500 mg/Vial, Tk. 120.00/Vial
Cefzon *(Navana),*Inj., 1 gm/Vial, Tk. 15.8//Vial**;** 250 mg/Vial, Tk. 70.26/Vial; 500 mg/Vial, Tk. 115.43/Vial
Lesero *(Ziska),* Inj., 1 gm/Vial, Tk. 215.00/Vial; 250 mg/Vial, Tk. 70.00/Vial; 500 mg/Vial, Tk. 115.00/Vial

Maxbac *(Rangs),* Inj.1 gm/Vial, Tk. 240.00/Vial; 250mg/vial, Tk. 85.00/Vial; 500mg/vial, Tk. 130.00/Vial
Maxidim *(Beximco),* Inj.,1 gm/Vial, Tk. 240.00/Vial; 250 mg/Vial, Tk. 85.00/Vial; 500 mg/Vial, Tk. 130.00/Vial
Serozid *(Opsonin),* Inj., 1 gm/Vial, Tk. 180.45/Vial; Tk. 63.91/Vial;Tk. 97.74/Vial
Sidoba, *(Incepta),* Inj.,1 gm/Vial, Tk. 215.00/Vial; 250 mg/Vial, Tk.70.00/Vial; 500 mg/Vial, Tk. 115.00/Vial
Tazid*(Square),* Inj., 1 gm/Vial, Tk.240.00/Vial ; 250 mg/Vial, Tk. 85.00/Vial ; 500 mg/Vial, Tk. 130.00/Vial
Tazimax *(Eskayef),* Inj.,1 gm/Vial, Tk. 240.00/Vial; 250 mg/Vial, Tk.85.00/Vial
Tazime*(Rephco),* Inj., 1 gm/Vial, Tk.215.00/Vial; 500 mg/Vial, Tk. 115.00/Vial
Tizime *(Globe),* Inj., 500 mg/Vial, Tk. 115.00/Vial; 250 mg/Vial, Tk. 70.00/Vial; 1 gm/Vial, Tk. 210.00/Vial
Trizidim *(Acme),* Inj.1 gm/Vial, Tk.215.80/Vial; 250 mg/Vial, Tk.70.26/Vial ; Inj., 500 mg/Vial, Tk. 115.43/Vial
Trum *(Drug Int.),* Inj.,1 gm/Vial, Tk. 225.00/Vial; 500 mg/Vial, Tk. 120.00/Vial; 250 mg/Vial, Tk. 70.00/Vial
Zidicef *(Popular),* Inj., 250 mg/Vial, Tk. 70.26/Vial ; 500 mg/Vial, Tk. 115.43/Vial ; 1 gm/Vial, Tk. 215.81/Vial **;** 2 gm/Vial, Tk. 361.36/Vial
Zidim *(Orion),* Inj., 1 gm/Vial, Tk. 215.81/Vial; 250 mg/Vial, Tk. 70.26/Vial; 500 mg/Vial, Tk. 115.43/Vial
Zidimax *(Biopharma),* Inj.,1gm/Vial, Tk. 225.00/Vial; 250 mg/Vial, Tk. 70.00/Vial; 500 mg/Vial, Tk. 115.00/Vial
Zitum *(ACI),* Inj., 1 gm/Vial, Tk. 225.85/Vial; 250 mg/Vial , Tk. 70.26/Vial ;500 mg/Vial , Tk. 115.43/Vial

CEFTIBUTEN

Ceftibuten is an oral 3rd generation cephalosporin used similarly to cefixime in the treatment of urinary tract infection and respiratory tract infection.

Indications: *see under Cefixime* **Cautions, Contra-indications, Side-effects:** *see under Cefadroxil*

Interactions: *see Appendix-2*

Dose: ORAL: ADULT and CHILD > 10 years: 400 mg once daily; CHILD > 6 months: 8 mg/kg once daily

Proprietary Preparation

Ceftibuten *(Renata),* Cap.400mg, Tk.120/Cap

CEFTRIAXONE

Indications: surgical prophylaxis; also see under Cefotaxime
Cautions: *see under Cefadroxil*; also hepatic impairment, in premature neonates may displace bilirubin from binding sites of albumin
Contra-indications: neonates with jaundice, hypoalbuminemia, acidosis or impaired bilirubin binding; *also see under Cefadroxil*
Interactions: *see Appendix -2*
Side-effects: *see under Cefadroxil*; also pancreatitis, rarely prolongation of prothrombin time
Dose: *by IM or slow IV inj.* over at least 2-4 minutes or *IV infusion* 1 g daily for mild to moderate infections, increased to 2-4 g daily for severe infections; INFANT and CHILD 20-50 mg/kg daily in mild to moderate infections, up to 80 mg/kg daily in severe infections; doses of 50 mg/kg and over by IV infusion only; NEONATES by IV infusion over 60 minutes, 20-50 mg/kg daily up to a max. of 50 mg/kg daily; uncomplicated gonorrhea: by deep IM inj. of 250 mg as a single dose; surgical prophylaxis: by deep IM inj. or IV inj. over at least 2-4 minutes, 1 g a single dose; colorectal surgery deep IM inj. or inj. over at least 2-4 minutes or by IV infusion, 2 g as a single dose; IM doses over 1 g should be divided between more than one site

Proprietary Preparations

Aciphin*(ACI),* Inj., IM, 1 gm/Vial, Tk. 190.72/Vial; IV Tk. 190.72/Vial **;**IM 250 mg/Vial, Tk.100.00/Vial;IV 250 mg/Vial, Tk.100.00/Vial **;**IV 2 gm/Vial, Tk.301.13/Vial;IM 500 mg/Vial, Tk.130.00/Vial;IV 500 mg/Vial, Tk.130.00/Vial
Arixon *(Beximco),* Inj., IM, 1 gm/Vial, Tk. 190.00/Vial ;IM , 250 mg/Vial , Tk.100.00/Vial;IM , 500 mg/Vial, Tk.130.00/Vial;IV , 1 gm/Vial, Tk. 190.00/Vial;IV , 2 gm/Vial, Tk.300.00/Vial;IV, 250 mg/Vial, Tk.100.00/Vial ;IV 500 mg/Vial, Tk.130.00/Vial
Axon *Aristo),* Inj., IM, 1 gm/Vial, Tk. 150.00/Vial ;IV ,1 gm/Vial, Tk. 150.00/Vial;IM , 250 mg/Vial, Tk.90.00/Vial;IV , 250 mg/Vial, Tk.90.00/Vial;IV , 2 gm/Vial, Tk.260.00/Vial; IM, 500 mg/Vial, Tk.120.00/Vial;IV 500 mg/Vial, Tk.120.00/Vial

Axosin*(Ibn Sina),* Inj., IM, 1 gm/Vial, Tk. 180.00/Vial; IM, 250 mg/Vial, Tk.90.00/Vial; IM, 500 mg/Vial, Tk.120.46/Vial; IV, 1 gm/ Vial, Tk. 180.00/Vial; IV , 2 gm/Vial, Tk.290.00/Vial; IV ,250 mg/Vial, Tk.90.00/Vial; IV, 500 mg/Vial, Tk.120.46/Vial

Bakticef *(Opso Saline),* Inj., IM, 500 mg/Vial, Tk.97.74/Vial;IV , 1 gm/Vial, Tk. 142.86/Vial; IV, 2 gm/Vial, Tk.226.41/Vial

Cefast*(Leon),* Inj, IM, 1 gm/Vial, Tk. 190.00/Vial ;IV 1 gm/Vial, Tk. 190.00/Vial; IV , 2 gm/Vial, Tk.300.00/Vial ; IM , 500 mg/Vial, Tk.130.00/Vial; IV , 500 mg/Vial, Tk.130.00/Vial;

Cefaz *(Astra),* Inj.,IV , 2 gm/Vial, Tk.300.00/Vial IV, 1gm/Vial, Tk.190.00/Vial

Cefixon *(Techno),),* Inj, IM, 1 gm/Vial, Tk.175.00/Vial; IV, 1 gm/Vial, Tk.175.00/Vial; IV , 250 mg/Vial, Tk.75.00/Vial;Inj, 2 gm/Vial, Tk.320.00/Vial;IM , 500 mg/Vial, Tk.125.00/Vial IV ,500 mg/Vial, Tk.125.00/Vial

Ceftizone *(Renata)*, Inj.,IM, gm/Vial, Tk. 200.75/Vial; IV , 1 gm/Vial, Tk. 200.75/Vial; IV Inj, 250 mg/Vial, Tk.100.38/Vial ;IV , 2 gm/Vial, Tk.341.28/Vial;IV , 500 mg/Vial, Tk.140.53/Vial;IM Inj, 250 mg/Vial, Tk.100.38/Vial
IM , 500 mg/Vial, Tk.140.53/Vial

Ceftrimax *(Veritas),* Inj., IM, 1 gm/Vial, Tk.190.00/Vial;IV I, 1 gm/Vial, Tk.190.00/Vial;IV , 2 gm/Vial, Tk.300.00/Vial;IM 500 mg/Vial, Tk.130.00/Vial;IV , 500 mg/Vial, Tk.130.00/Vial

Ceftron *(Square),* Inj., IM, 1 gm/Vial, Tk.190.00/Vial; IV,1 gm/Vial, Tk.190.00/Vial;IM, 250 mg/Vial, Tk.100.00/Vial ;IV ,250 mg/Vial, Tk.100.00/Vial;IV , 2 gm/Vial, Tk.301.14/Vial;IM , 500 mg/Vial, Tk.130.00/Vial;IV ,
500 mg/Vial, Tk.130.00/Vial

Dicephin *(Drug),* Inj., IM, 1 gm/Vial, Tk.190/Vial ; IM , 250 mg/Vial, Tk.100/Vial; IM , 500 mg/Vial, Tk.130.00/Vial; IV, 1 gm/Vial, Tk.190.00/Vial; IV , 2 gm/Vial, Tk.300.00/VialIV , 250 mg/Vial, Tk.100.00/Vial IV , 500 mg/Vial, Tk.130.00/Vial

Enocef *(Sanofi),* Inj., IM, 1 gm/Vial, Tk.200.75/Vial ;IV , 250 mg/Vial, Tk.200.75/Vial;IM , 250 mg/Vial, Tk.100.38/Vial;IV, 250 mg/Vial, Tk.100.38/Vial ;IM, 500 mg/Vial, Tk.150.57/Vial ;IV , 500 mg/Vial, Tk.150.57/Vial

Eracef*(Popular),* Inj.,IM, 1 gm/Vial , Tk.190.00/Vial ;IM, 250 mg/Vial, Tk.100.00/Vial ;IM , 500 mg/Vial, Tk.130.00/Vial;IV , 1 gm/Vial, Tk.190.00/Vial; IV , 2 gm/Vial, Tk.301.13/Vial ;IV Inj, 250 mg/Vial, Tk.100.00/Vial;IV , 500 mg/Vial, Tk.130.00/Vial

Exephin *(Incepta),* Inj., IM,, 1 gm/Vial, Tk.190.00/Vial;IV, 1 gm/Vial, Tk.190.00/Vial; IV , 2 gm/Vial, Tk.300.00/Vial;IM , 250 mg/Vial, Tk.100.00/Vial ;IV , 250 mg/Vial, Tk.100.00/Vial;IM ,500 mg/Vial, Tk.130.00/Vial;
IV , 500 mg/Vial, Tk.130.00/Vial

G-Ceftriax *(Gonoshasthaya),* Inj., IM, 1 gm/Vial, Tk. 150.00/Vial;IM , 250 mg/Vial, Tk. 75.00/Vial ;IM Inj, 500 mg/Vial, Tk. 120.00/Vial ;IV , 250 mg/Vial, Tk. 75.00/Vial ;IV , 2 gm/Vial,Tk. 200.00/Vial
IV , 1 gm/Vial, Tk. 150.00/Vial;IV Inj, 500 mg/Vial,Tk. 120.00/Vial

Imacef *(General),* Inj., IM, 1 gm/Vial, Tk.160.60/Vial; IV, 1 gm/Vial, Tk.160.60/Vial;IV, 2 gm/Vial, Tk.301.13/Vial;IM , 250 mg/Vial, Tk.90.34/Vial;IV , 250 mg/Vial, Tk.90.34/Vial IM , 500 mg/Vial, Tk.120.45/Vial;IV , 500 mg/Vial, Tk.120.45/Vial

Infecef *(Alco),* Inj.,IM, 1 gm/Vial, Tk.190.00/Vial ;IV Inj, 1 gm/Vial, Tk.190.00/Vial ;IV , 2 gm/Vial, Tk.300.00/Vial ;IM, 250 mg/Vial, Tk.100.00/Vial;IM , 500 mg/Vial, Tk.130.00/Vial ;

Inoxon*(Rephco),* Inj.,IM, 1 gm/Vial, Tk.180.00/Vial;IM , 250 mg/Vial, Tk.90/Vial ; IM, 500 mg/Vial, Tk. 120.00/Vial ;IV , 1 gm/Vial, Tk.180.00/Vial;IV , 250 mg/Vial, Tk.80.00/Vial;, IV , 500 mg/Vial, Tk.120.00/Vial, IV , 2 gm/Vial, Tk.300.00/Vial; IV , 2 gm/Vial, Tk.300.00/Vial

Keptrix*(Apex),* Inj.,IM, 1 gm/Vial, Tk.160.00/Vial ;IV , 1 gm/Vial, Tk.160.00/Vial; IV , 2 gm/Vial, Tk.300.00/Vial ;IM , 250 mg/Vial, Tk.90.00/ViaIIM , 500 mg/Vial, Tk.120.00/Vial

Megion *(Novartis),* Inj.,IM, 1 gm/Vial, Tk.320.00/Vial; IM I, 1 gm/Vial, Tk.320.00/Vial IM , 250 mg/Vial, Tk.125.00/Vial; IM, 500 mg/Vial , Tk.175.00/Vial

Odatrix *(Unimed),* IM Inj, 500 mg/Vial, Tk.120.00/Vial;IV , 1 gm/Vial, Tk.160.00/Vial;IV , 2 gm/Vial, Tk.300.00/Vial

Oricef *(Healthcare),* Inj.,IM, 1 gm/Vial, Tk.320.00/Vial; IM 250 mg/Vial, Tk.130.00/Vial; IM , 500 mg/Vial, Tk.200.00/Vial; IV ,1 gm/Vial, Tk.320/Vial ; IV, 2 gm/Vial, Tk.490.00/Vial ;IV 250 mg/Vial, Tk.130.00/Vial
IV, 500 mg/Vial, Tk.200.00/Vial

Orizone *(Pharmacil),* Inj.,IV 1 gm/Vial, Tk.290.00/Vial ;IV , 2 gm/Vial, Tk.500.00/Vial; IV, 500 mg/Vial, Tk.200.00/Vial

Parcef *(Jayson),* Inj.,IM, 1 gm/Vial, Tk.160.00/Vial ;IM , 250 mg/Vial, Tk.80.00/Vial ;IM , 500 mg/Vial, Tk.120.00/Vial; IV , 1 gm/Vial, Tk.160.00/Vial;IV , 250 mg/Vial, Tk.80.00/Vial;IV, 500 mg/Vial, Tk.120.00/Vial

Rakxon *(RAK),* IM Inj, 1 gm/Vial, Tk.190.00/Vial; IV, 1 gm/Vial, Tk.190.00/Vial;IV , 2 gm/Vial, Tk.300.00/Vial;, IM, 250 mg/Vial, Tk.95.00/Vial;IM , 500 mg/Vial, Tk.130.00/Vial
Rit *(Kemiko),* IM Inj, 1 gm/Vial, Tk.190.00/Vial; IV , 1 gm/Vial, Tk.190.00/Vial; IV, 2 gm/Vial, Tk.300.00/Vial ;IM 250 mg/Vial, Tk.95.00/Vial ;IV , 250 mg/Vial, Tk.95.00/Vial; IM , 500 mg/Vial, Tk.120.00/Vial**;** IV, 500 mg/Vial, Tk.120.00/Vial
Rofecin *(Radiant),* IM Inj, 1 gm/Vial, Tk.360.00/Vial ;IM , 250 mg/Vial, Tk.150.00/Vial ;IM , 500 mg/Vial, Tk.220.00/Vial ;Inj, 250 mg/Vial, Tk.150.00/Vial ; Tk.220.00/Vial ; IV , 1 gm/Vial, Tk.360.00/Vial ; IV 2 gm/Vial, Tk.680.00/Vial
Topcef *(Navana),* Inj., 1 gm/Vial, Tk.190.00/Vial;Inj., 2 gm/Vial, Tk.301.12/Vial;Inj., 250 mg/Vial, Tk.90.33/Vial;Inj., 500 mg/Vial, Tk.120.00/Vial
Traxef *(Beacon),* Inj, 1 gm/Vial, Tk.320.00/Vial
Traxon *(Opsonin),* IM Inj, 1 gm/Vial, Tk.142.86/Vial;IM , 1 gm/Vial, Tk.75.19/Vial;IM, 500 mg/Vial, Tk.97.74/Vial; IV, 1 gm/Vial, Tk.142.86/Vial; IV , 2 gm/Vial, Tk.226.41/Vial;IV 250 mg/Vial, Tk.75.19/Vial**;** IV , 500 mg/Vial, Tk.97.74/Vial
Triject *(Eskayef),* IM Inj, 1 gm/Vial, Tk.190.00/Vial ;IV, 1 gm/Vial, Tk.190.00/Vial; IM, 250 mg/Vial, Tk.100.00/Vial; IV , 250 mg/Vial, Tk.100.00/Vial ;IV , 2 gm/Vial, Tk.300.00/Vial ; IM , 500 mg/Vial, Tk.130.00/Vial ;IV, 500 mg/Vial, Tk.130.00/Vial
Trimax *(Pharmasia),* IM Inj, 1 gm/Vial, Tk.160.00/Vial ;IV , 1 gm/Vial, Tk.160.00/Vial ; IM , 250 mg/Vial, Tk.90.00/Vial ; IV 2 gm/Vial, Tk.300.00/Vial ;IM, 500 mg/Vial, Tk.120.00/Vial**;** IV , 500 mg/Vial, Tk.120.00/Vial
Trizon *(Acme),* IV Inj, 2 gm/Vial, Tk.300.00/Vial; IM Inj, 1 gm/Vial, Tk.190.00/Vial ;IM , 250 mg/Vial, Tk.100.00/Vial ; IM , 500 mg/Vial, Tk.130.00/Vial ;IV, 1 gm/Vial, Tk.190.00/Vial ; IV 250 mg/Vial, Tk.100.00/Vial ;IV, 500 mg/Vial, Tk.130.00/Vial
Vertex *(Orion),* IM Inj, 1 gm/Vial, Tk. 190.00/Vial ; IV, 1gm/Vial, Tk.190.00/Vial ;IV 2 gm/Vial, Tk.301.14/Vial; IM , 250 mg/Vial, Tk.100.00/Vial ;IV, 250 mg/Vial, Tk.100.00/Vial M , 500 mg/Vial, Tk.130.00/Vial ;IV , 500 mg/Vial, Tk.130.00/Vial
Winner *(Biopharma),* IM Inj, 1 gm/Vial, Tk.180.68/Vial ;IV , 1 gm/Vial, Tk.180.68/Vial ; IV , 2 gm/Vial, Tk.300.00/Vial ; IM , 250 mg/Vial, Tk.90.34/Vial ;IV Inj, 250 mg/Vial, Tk.90.34/Vial**;**IM Inj, 500 mg/Vial, Tk.120.45/Vial**;** IV , 500 mg/Vial, Tk.120.45/Vial
Xone*(Delta),* IM Inj, 500 mg/Vial, Tk.130.00/Vial ;IV , 1 gm/Vial, Tk.190.00/Vial ; IV, 2 gm/Vial, Tk.300.00/Vial; IV 500 mg/Vial, Tk.130.00/Vial
Oryx *(Rangs),* IM Inj., 1gm/vial, Tk. 200.00/Vial; 250mg/vial, Tk. 100.00/Vial; 500mg/vial, Tk. 150.00/Vial; IV Inj., 1gm/vial, Tk. 200.00/Vial; 2gm/vial, Tk. 350.00/Vial; 250mg/vial, Tk. 100.00/Vial; 500mg/vial, Tk. 150.00/Vial
Powercef *(Chemist),* IM Inj., 1 gm/Vial, Tk. 160.00/Vial; 250mg/Vial, Tk. 80.00/Vial; IM Inj., 500mg/Vial, Tk. 130.00/Vial; IV Inj., 2 gm/Vial, Tk. 160.00/Vial; 2 gm/Vial, Tk. 300.00/Vial
Trax *(Medimet),* IM Inj., 1gm/Vial, Tk.160.00/Vial; 250mg/Vial, Tk.90.00/Vial; 500mg/Vial, Tk.120.00/Vial; IV Inj., 1gm/Vial, Tk.160.00/Vial; 250mg/Vial, Tk.90.00/Vial; 500mg/Vial, Tk.120.00/Vial
Tribac *(Globe),* IM Inj., 1 gm/Vial, Tk. 180.00/Vial; 250 mg/Vial, Tk. 90.00/Vial; 500 mg/Vial, Tk. 120.00/Vial; IV Inj., 1 gm/Vial, Tk. 180.00/Vial; 2 gm/Vial, Tk. 300.00/Vial; 250 mg/Vial, Tk. 90.00/Vial; 500 mg/Vial, Tk. 120.00/Vial
Triphin *(Ziska),* IM Inj., 1gm/Vial, Tk. 160.00/Vial; 250mg/Vial, Tk. 80.00/Vial; 500mg/Vial, Tk. 120.00/Vial; IV Inj., 1 gm/Vial, Tk. 160.00/Vial; 250mg/Vial, Tk. 80.00/Vial; 2 gm/Vial, Tk. 250.00/Vial; 500mg/Vial, Tk. 120.00/Vial

1.1.2.2 FOURTH-GENERATION CEPHALOSPORINS

Fourth generation drugs have an extended spectrum of activity compared to third generation and have increased stability against betalactamases. They are considered to be particularly useful in infections caused by aerobic gram-negative organisms resistant to third generation cephalosporins.

CEFEPIME

Indications: drug of choice for the empirical treatment of nosocomial infections, i.e. nosocomial isolates of *enterobacter, citrobacter and serratia*; also *see under Cefixime*
Cautions, Contra-indications, Side-effects: *see under Cefadroxil*
Interactions: *see Appendix-2*

Dose: *by slow IV inj*. over at least 2-4 minutes or IV infusion 0.5-1 g 12 hourly for mild to moderate infections; increased to 2 g daily every 12 hours for severe infections; INFANT and CHILD 75-120 mg/kg/day in 2-3 divided doses

Proprietary Preparations
Cefa *(Popular),* Inj., 500mg/Vial, Tk. 300.00/Vial; 1gm/Vial, Tk. 550.00/Vial; 2gm/Vial, Tk. 1,100.00/Vial
Ceftipime *(Renata),* Inj., 500 mg/vial, Tk. 301.13/Vial; 1 gm/vial, Tk. 552.08/Vial; 2 gm/vial, Tk. 1,104.15/Vial
Cepime *(Rephco),* Inj., 500mg/Vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial
Efepime *(Ziska),* Inj., 1 gm/Vial, Tk. 550.00/Vial; 2 gm/Vial, Tk. 1100/Vial; 500 mg/Vial, Tk. 300.00/Vial
Forgen *(Aristo),* Inj., 500 mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial; 2 gm/vial, Tk. 1,100.00/Vial
Gen *(Ibn Sina),* Inj., 500mg/vial, Tk. 305.00/Vial; 1 gm/vial, Tk. 555.00/Vial; 2 gm/vial, Tk.1,010.00/Vial
Japime *(Jayson),* Inj., 1 gm/vial, Tk. 550.00/Vial
Maxpime *(Square),* Inj., 500 mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial; 2 gm/vial, Tk. 1,100.00/Vial
Megapime *(Eskayef),* Inj, 500 mg/vial, Tk. 300.00/Vial;1 gm/vial , Tk. 550.00/Vial; 2 gm/vial, Tk. 1,100.00/Vial
Pime *(ACI),* Inj., 500mg/vial, Tk. 301.13/Vial; 1gm/vial, Tk.552.07/Vial; 2gm/vial , Tk. 1,104.15/Vial
Superpime, *(Acme),* Inj., 500mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial; 2 gm/vial, Tk. 1,100.00/Vial
Tetracef *(Beximco),* Inj., 500 mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial; 2 gm/vial, Tk.1,100.00/Vial
Tupime *(Kemiko),* Inj., 1 gm/vial, Tk. 550.00/Vial
Ultrapime *(Incepta),* Inj., 500 mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial
Unipim *(Drug Intl),* Inj., 500mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 500.00/Vial
Winnipime *(Sanofi),* Inj., 500mg/vial, Tk. 300.00/Vial; 1gm/vial, Tk. 550.00/Vial; 2gm/vial, Tk. 1,100.00/Vial
Xemimax *(Pharmasia),* Inj., 500 mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial
Xenim *(Opsonin),* Inj., 500mg/Vial , Tk. 226.41/Vial; 1 gm/vial, Tk. 415.10/Vial
Ximepime *(Globe),* Inj., 500 mg/vial, Tk. 300.00/Vial; 2 gm/vial, Tk. 1100.00/Vial; 1 gm/vial, Tk. 550.00/Vial
Zopime *(Healthcare),* Inj., 500 mg/vial, Tk. 300.00/Vial; 1 gm/vial, Tk. 550.00/Vial

CEFPIROME

Indications: infections due to sensitive Gram positive and Gram-negative bacteria

Cautions, Contra-indications, Side-effects: *see under Cefadroxil*

Interactions: *see Appendix -2*

Dose:*IV inj. or infusion*: complicated upper and lower UTI, Skin and Soft tissue infections, 1 g every 12 hours, increased to 2 g every 12 hours in very severe infections;

Lower Respiratory Tract Infection, 1-2 g every 12 hours;

Severe infections including bacteremia and septicemia and infections in neutropenic patients, 2 g every 12 hours CHILD less than 12 years not recommended

Proprietary Preparation
Force *(Square),* IV Inj. 1 gm/Vial, Tk. 401.51/Vial

1.1.3 OTHER BETA-LACTUMS

1.1.3.1 CARBAPENEMS
1.1.3.2 MONOBACTAM

Besides **Penicillins** and **Cephalosporins**, **Carbapenems** (**Doripenem, Ertapenem, Imipenem, Meropenem**) and monobactam **(Aztreonam**) are important therapeutic agents with a beta lactam structure. They are bactericidal and act by inhibiting cell wall synthesis of susceptible organisms.

1.1.3.1. CARBAPENEMS

The carbapenems have wide spectrum of activity, being active against many aerobic and anaerobic gram-positive and gram-negative organisms, including *Listeria, Pseudomonas* and most *Enterobacteriaceae.* **Carbapenem**s are resistant to wide spectrum of betalactamases.

DORIPENEM

Doripenem is the newest of the carbapenems with a broad spectrum and enhanced gram-negative antimicrobial activity particularly against *P aeruginosa*.

Whether the improved in vitro activity of **Doripenem** against *P aeruginosa* translates into superior clinical outcomes for patients infected with such isolates requires further evaluation. Because doripenem exhibits similarities with **imipenem/cilastatin** and meropenem, it is likely that institutional susceptibility patterns and cost may be the 2 factors that will carry the most weight in prescribing decisions.
Indications: treatment of complicated intra-abdominal infections and complicated urinary tract infections, including pyelonephritis; ***based on recent clinical data, doripenem is no longer recommended for Ventilator-Associated Pneumonia***; *also see Notes above*
Cautions: hypersensitivity to beta lactams, pregnancy, CNS disorders, renal impairment
Contra-indications: hypersensitivity;
Interactions: *see Appendix-2*
Side-effects: *see under Cefadroxil,* also seizures, convulsions, confusion and mental disturbances
Dose: *Complicated Intra-abdominal Infection:* 500 mg IV infusion over 1 hour 8 hourly x 5-14 days, at least 3 days IV, may switch to an appropriate oral treatment if clinical improvement Noted; *Complicated UTI*
500 mg IV infusion over 1 hour 8 hourly x 10 days can be extended up to 14 days if concurrent bacteremia; *treatment of bronchopulmonary infection* in patients with cystic fibrosis who are colonized with P aeruginosa
***Note*: in patients with renal insufficiency:**
Cc >50 mL/min: No adjustment
Cc 30-50 mL/min: 250 mg IV q8hr
Cc 10-30 mL/min: 250 mg IV q12hr

Proprietary Preparations
Doripen *(Eskayef),* Inj, 500 mg/Vial, Tk. 2,000/Vial; 250 mg/Vial, Tk. 1,300/Vial
Dorinem *(ACI),* Inj, 500 mg/Vial, Tk. 2,000/Vial

ERTAPENEM

Ertapenem is considered a narrower spectrum agent, as it has limited activity against certain pathogens of concern such as *P aeruginosa*.
Indications: infection against *P aeruginosa*.
Cautions: hypersensitivity to other beta-lactams, pregnancy, CNS disorders, renal impairment
Interactions: *see Appendix-2*
Side-effects: *see under Cefadroxil*
Dose : 1 gram IV or IM once daily for 5 to 14 days

Proprietary Preparation
Etropen *(Techno)* Inj.,1 gm/vial,Tk.3400/vial

IMIPENEM WITH CILASTATIN

Imipenem is rapidly inactivated to potentially nephrotoxic metabolite by dihydropeptidase in the brush border of proximal renal tubule and is therefore given in combination with cilastatin, a specific inhibitor of this enzyme.
Indications: drug of choice for infections caused by cephalosporin-resistant nosocomial bacteria, such as Citrobacter freundii and Enterobacter spp; good choice for empiric treatment of serious infections in hospitalized patients who have recently received other beta-lactam drugs, urinary tract and lower respiratory infections, septicemia particularly of renal origin, intraabdominal and gynecological infections, skin, soft-tissue, bone and joint infections, surgical prophylaxis; also see Notes above
Cautions: hypersensitivity to other beta-lactams, pregnancy, CNS disorders, renal impairment
Contra-indications: hypersensitivity to imipenem or cilastatin, breast-feeding
Interactions: *see Appendix -2*
Side-effects: *see under Cefadroxil*, also seizures, convulsions, confusion and mental disturbances, increases in serum creatinine and blood urea, tooth or tongue discoloration, red coloration of urine in children
Dose: *deep IM inj*.: 500-750 mg 12 hourly; *gonococcal urethritis or cervicitis*, 500 mg a single dose; IV infusion, 1-2 g daily in 3-4 divided doses, may be increased to 50 mg/kg up to a max. of 4 g daily; CHILD > 3 months, 60

mg/kg/day in 4 divided doses; *surgical prophylaxis*:IV infusion: 1 g at induction of anesthesia repeated after 3 hours, supplemented in colorectal, cardiac surgery by doses of 500 mg 8 and 16 hours after induction

Proprietary Preparations

Cispenam *(Incepta),* Inj., 500 mg + 500 mg/Vial, Tk. 1,195.00/Vial ;Inj., 250 mg + 250 mg/Vial, Tk. 650.00/Vial ; 750 mg + 750 mg/Vial, Tk. 1,650.00/Vial
Imipen *(Techno),* Inj., 500 mg + 500 mg/Vial, Tk. 1,195.00/Vial ;;
Imbac *(Popular),* Inj., 500 mg + 500 mg/Vial, Tk. 1,199.51/Vial
Iminem *(ACI),* Inj., 500 mg + 500 mg/Vial, Tk. 1,199.51/Vial
Iropen *(Renata),* Inj., 500 mg + 500 mg/Vial, Tk. 1,295.00/Vial
Maxipen *(Opsonin),* Inj., 500 mg + 500 mg/Vial, Tk. 973.68/Vial

MEROPENEM

Indications: aerobic and anaerobic Gram-positive and Gram-negative infections, septicemia; *see also notes above*

Cautions: hypersensitivity to beta-lactam antibiotics; hepatic impairment (*Appendix-3);* renal impairment *(appendix-4);* pregnancy *(appendix-5);* and breast-feeding*(appendix-6);*

Interactions: *see Appendix-2*

Contra indications: hypersensitivity to meropenem.

Side-effects: gastrointestinal disturbances such as nausea, vomiting, diarrhoea, abdominal pain; disturbance of liver function tests; hypersensitivity reaction such as skin rash, pruritus, urticaria, thrombocytopenia, positive Coombs test; eosinophilia, neutropenia, leucopenia; headache, paraesthesia; also reported convulsion, Steven-Johnson syndrome and toxic epidermal necrolysis; local reactions including pain and thrombophlebitis at injection site

Dose: *by intravenous injection* over 3 to 5minutes or *by intravenous infusion* over 15 to 30minutes in a usual dose of 0.5 to 1g every 8 hours; dose may be doubled in hospital-acquired pneumonia, peritonitis, septicemia and infections in neutropenic patients. 2g every 8 hours for meningitis; dose of up to2 g every 8hours also been used in cystic fibrosis. Dose should be reduced in patients with renal impairment; CHILD over 3 months of age and weighing less than of 50kg, 10-20mg/kg every 8 hours (not recommended for infection in neutropenia)

For meningitis, 2g every 8 hours; CHILD 3 months to 12 years 40mg/kg every 8 hours; over 50 kg body weight adult dose

Exacerbations of chronic lower respiratory-tract infection in cystic fibrosis, up to 2g every 8 hours; CHILD 4-18 years 25-40mg/kg every 8 hours

Proprietary Preparations

Aronem *(ACI),* Inj., 500 mg/Vial , Tk. 652.45/Vial; 1 gm/Vial , Tk. 1,204.52/Vial
Aropen *(Aristo),* Inj., 500 mg/Vial, Tk. 650.00/Vial**;**1 gm/Vial, Tk. 1200.00/Vial
Carbanem *(Sanofi),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
Curepen *(Opso Saline),* Inj., 500 mg/Vial, Tk. 490.56/Vial; 1 gm/Vial, Tk. 943.40/Vial
Fulspec *(Acme),*Inj., 500 mg/Vial, Tk. 652.45/Vial; 1 gm/Vial, Tk. 1,204.53/Vial
Intrapen *(General),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
I-Penam *(Incepta),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
Menem *(Astra),* IV Inj., 1 gm/Vial, Tk. 1300.00/Vial
Merobac *(Popular),* Inj., 500 mg/Vial, Tk. 652.45/Vial; 1 gm/Vial, Tk. 1,204.53/Vial
Merocar *(Globe),* IV Inj., 500 mg/Vial, Tk. 650.00/Vial; 1 gm/Vial, Tk. 1200.00/Vial
Merocil *(Pharmacil),* Inj., 500 mg/Vial, Tk. 850/Vial; 1 gm/Vial, Tk. 1,590.00/Vial
Merocon *(Beacon),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
Meroject *(Eskayef),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
Merom *(Techno),* Inj., 500 mg/Vial, Tk. 780.00/Vial ; 1 gm/Vial, Tk. 1,550.00/Vial
Meromax *(Orion),* Inj., 500 mg/Vial, Tk. 652.45/Vial; 1 gm/Vial, Tk. 1,204.45/Vial
Meropen *(Renata),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
Merotrax *(Ibn Sina),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
Neopenem *(Healthcare),* Inj., 500 mg/Vial, Tk. 750.00/Vial; 1 gm/Vial, Tk. 1,350.00/Vial

Ronem *(Opsonin),* Inj., 500 mg/Vial, Tk. 490.56/Vial; 1 gm/Vial, Tk. 943.40/Vial
Ropenem*(Drug Int.),* Inj., 500 mg/Vial, Tk. 501.64/Vial; 1 gm/Vial, Tk. 1,000.00/Vial
R-Penem *(RAK),* Inj., 500 mg/Vial, Tk. 700.00/Vial; 1 gm/Vial, Tk. 1300.00/Vial
Specbac *(Square),* Inj., 500 mg/Vial, Tk. 652.45/Vial; 1 gm/Vial, Tk. 1,204.53/Vial
Veronem *(Veritas),* Inj., 500 mg/Vial, Tk. 650.00/Vial; 1 gm/Vial , Tk. 1200.00/Vial

1.1.3.2 MONOBACTAM

AZTREONAM

The monobactam **Aztreonam** has different antibacterial activity in comparison to those of other beta lactam antibiotics and more closely resembles that of an aminoglycoside antibiotic. Its activity is limited to gram-negative aerobic bacteria, including *P. aeruginosa*, N. meningitides*, N. gonorrhea and H. influenzae*. As aztreonam is not effective against gram-positive organisms, it should not be used for 'blind treatment'. Aztreonam is resistant to wide spectrum of betalactamases.

Indications: gram negative infections caused by *Pseudomonas aeruginosa, Hemophilus influenzae, Neisseria meningitides and N. gonorrhea*
Cautions: hepatic impairment, breast-feeding; penicillins- and/or cephalosporins-allergic patients tolerate aztreonam without reaction
Contra-indications: aztreonam hypersensitivity; pregnancy
Interactions: *see Appendix-2*
Side-effects: nausea, vomiting, diarrhea, abdominal cramps, mouth ulcers, altered taste, jaundice and hepatitis, blood disorders including thrombocytopenia and neutropenia, urticaria and rashes
Dose: *deep IM or slow IV inj.* over at least 2-4 minutes or IV infusion: 1 g every 8 hours for mild to moderate infections; increased to 2 g every 6-8 hours for severe infections; CHILD > 1 week, IV inj. or infusion: 30 mg/kg every 6-8 hours, increased for severe infections in child > 2 years, to 50 mg/kg every 6-8 hours up to a max. of 8 g/day; for urinary tract infections, 0.5-1 g 8-12 hourly; for gonorrhea or cystitis, 1 g by IM inj. as a single dose

Proprietary Preparations
Atreon *(Square),* Inj., 500 mg/Vial, Tk. 300/Vial ; 2 gm/Vial, Tk. 650/Vial ;1 gm/vial, Tk. 450/Vial
Azonam *(Incepta),* Inj., 1 gm/Vial, Tk. 400/Vial

1.1.4. AMINOGLYCOSIDES

These drugs are primarily active against aerobic, gram-negative bacilli. Because of limited spectrum compared with other aminoglycosides, **Kanamycin** and **Streptomycin** are not recommended for infections caused by *P. aeruginosa* and Serratia. **Streptomycin** is active against *Mycobacterium tuberculosis*, for which it is now entirely reserved. **Gentamicin** and **Tobramycin** exhibit similar activity but against *P. aeruginosa* and some strains of Proteus species **Tobramycin** is considered to be superior. Aminoglycosides have limited activity against gram-positive bacteria. *S. aureus* and *Strep*. *viridans* appear to be sensitive while other gram-positive organisms and anaerobes are resistant. These are highly polar cations and less than 1% of a dose is absorbed following either oral or rectal administration (must not be used for systemic infection), though long term oral or rectal administration may result in accumulation of drug in toxic concentrations in patients with renal insufficiency. **Gentamicin** absorption is increased in gastrointestinal diseases (ulcers, inflammatory bowel disease). Instillation of aminoglycosides into body cavities with serosal surfaces may result in rapid absorption and unexpected toxicity. Similarly, absorption of these drugs applied topically for long periods to large wounds, burns, or cutaneous ulcers can result in toxicity, particularly in renal insufficiency. After IM inj. aminoglycosides reach peak concentrations in blood within 30-90 minutes. High concentrations are seen in renal cortex and in endolymph and perilymph of the inner ear. CSF-

concentrations of these drugs with parenteral administration are subtherapeutic and penetration into ocular fluids is so poor that effective therapy of bacterial endophthalmitis requires periocular and intraocular injections. Aminoglycosides are cleared from body through kidney in the unchanged state, excretion being directly proportionate to creatinine clearance.
Cautions: Patients with renal impairment may require earlier and more frequent concentration measurement. Patients with creatinine clearance value less than 80-100 ml/min. needs dose adjustment. Monitoring for ototoxicity by careful audiometric examination also is required in patients receiving high dosed and/or prolonged courses of aminoglycosides.Cautions are also required in pregnancy and in nursing mothers.
Use of aminoglycosides in second and third trimesters of pregnancy carries the risk of auditory or vestibular nerve damage. **Streptomycin** has the greatest risk and with **Gentamicin** and **Tobramycin** the risk is probably very small but should not be used unless essential (if given, serum concentration must be monitored).
Side-effects: All aminoglycosides are ototoxic and nephrotoxic. Ototoxicity is largely irreversible Concurrent use of frusemide, ethacrynic acid potentiates ototoxicity. Cochlear toxicity initiates as a high-pitched tinnitus followed by auditory impairment. Vestibular toxicity starts as moderately intense headache which is rapidly followed by an acute stage of nausea, vomiting and difficulty with equilibrium. All aminoglycosides are capable of affecting both cochlear and vestibular function. **Tobramycin** affects both functions, whereas **Amikacin, Neomycin and kanamycin** primarily affect auditory function and streptomycin and gentamicin are primarily vestibulotoxic. Nephrotoxicity of aminoglycosides is almost always reversible and starts as a defect in renal concentrating ability, mild proteinuria and appearance of hyaline and granular casts in urine. Most common significant finding is mild rise in serum creatinine. The most important result of nephrotoxicity is the reduced excretion of drug which, in turn, predisposes to ototoxicity. Other potentially nephrotoxic drugs such as **amphotericin B, vancomycin, cisplatin, cyclosporine, cephalothin** aggravate aminoglycosides induced nephrotoxicity. In very high doses, these drugs can produce curare-like neuromuscular blockade and may cause respiratory paralysis.

AMIKACIN

Indications: preferred choice for initial treatment of serious nosocomial gram-negative bacillary infections resistant to gentamicin and tobramycin; *also see under Gentamicin*
Cautions, Contra-indications, Side-effects: *see notes above*
Dose: *IM or slow IV inj. or IV infusion*, 15 mg/kg daily divided doses every 12 hours

Note: one-hour ("peak") concentration should not exceed 30 mg/litre; pre-dose ("trough") concentration should be less than 10 mg/litre

Proprietary Preparations

Amikin *(Incepta),* Inj., 100mg/2ml, Tk. 16.00/2ml; 500 mg/Vial, Tk. 48.00/Vial
Amimax *(Biopharma),* Inj., 100mg/2ml, Tk. 16.00/2ml; 500 mg/Vial, Tk. 48.00/Vial
Amistar *(Square),* Inj., 100 mg/2 ml, Tk. 16.00/2ml; 500mg/2ml, Tk. 48.00/Vial
Cinamak *(Techno),* Inj., 250mg/Vial, Tk. 24.00/Vial; 500 mg/Vial, Tk. 42.00/Vial
Kacin *(ACI),* Inj., 100mg/2ml, Tk. 16.06 /2 ml; 500mg/2ml, Tk. 48.00/Vial
Mikacin *(Aristo),* Inj., 100mg/2ml, Tk. 16.00/2 ml; 500mg/ 2ml, Tk. 48.00/Vial
Psudonil *(Drug Intl),* Inj., 100mg/2ml, Tk. 16.00/2 ml; 250mg/Vial, Tk. 30.00/Vial; 500 mg/Vial, Tk. 45.00/Vial

GENTAMICIN[ED]

Indications: urinary tract infections, bacteremia, infected burns, osteomyelitis, sepsis, pneumonia, peritonitis, biliary tract infections, acute pyelonephritis or prostatitis, otitis,

meningitis, ocular infections caused by susceptible organisms *(see notes above*); with an antipseudomonal penicillin for sepsis in granulocytopenic patients, concurrently with penicillin G for bacterial endocarditis due to viridans *streptococci or enterococci*; in combination with nafcillin in selected cases of *staphylococcal endocarditis*; in combination with a penicillin and/or metronidazole for surgical chemoprophylaxis, and in undiagnosed serious infections

Cautions: *see notes above*

Contra-indications: myasthenia gravis; also *see notes above*

Side effects: *see notes above;* also hypomagnesaemia on prolonged therapy

Dose: *IM or slow IV* inj. over at least 3 minutes, initially 2 mg/kg, then 3-5 mg/kg daily in divided doses every 8 hours, or as once-daily dose by IV infusion, 5 mg/kg given over 30-60 minutes; CHILD up to 2 weeks 3 mg/kg every 12 hours; 2 weeks-12 years 2 mg/kg every 8 hours; by intrathecal inj.1-10 mg daily; ear and eye infections, 3-4 drops 3-4 times daily

Note: one-hour ("peak") concentration should not exceed 10 mg/litre (5 mg/litre in endocarditis); pre-dose ("trough") concentration should be less than 2 mg/litre (less than 1mg /litre in endocarditis)

Proprietary Preparations

Genacyn *(Square),* Inj., 20 mg/2 ml,Tk. 6.09/Amp.; 80mg/2 ml, Tk. 10.15/Amp.
Gentabac *(Popular),* Inj., 80 mg/2 ml, Tk.10.15/Amp. Inj., 20 mg/2 ml, Tk. 6.07/Amp.
Gentasol *(Techno),* Inj., 80 mg/2 ml, Tk. 9.50/Amp
Gentin *(Opsonin),* Inj., 20 mg/2 ml, Tk. 4.57/Amp.; 80mg/2 ml, Tk. 10.52/Amp.
G-Gentamicin *(Gonoshasthaya),* Inj., 40 mg/2 ml, Tk. 10.00/Amp.; 80 mg/2 ml, Tk.12.00/Amp.
Intamycin *(Incepta),* Inj., 80 mg/2 ml, Tk. 10.00/Amp.
Optimycin *(Aristo),* Inj., 80 mg/2 ml, Tk. 10.00/Amp.

NEOMYCIN SULPHATE

Indications: bowel sterilization before surgery, with polymyxins for bladder irrigation to prevent bacteremia and bacteriuria associated with the use of indwelling catheters, infections associated with burns, wounds, ulcers, dermatoses caused by susceptible organisms, as an adjunct to the therapy of hepatic coma

Cautions: too toxic for systemic use; because severe renal insufficiency may develop in the late stages of hepatic coma, great cautions should be taken when neomycin is utilized as an adjunct and should be stopped if there is ototoxicity or evidence of renal injury; also *see notes above*

Contra-indications:intestinal obstruction; *also see notes above*

Side-effects: *see notes above;* also increased salivation, stomatitis

Interactions: *see Appendix-2*

Dose: *oral*: preoperative bowel sterilization, 1 g every 4 hours, for 2-3 days; hepatic coma, up to 4 g daily in divided doses usually for max.14 days

Side-effects: increased salivation, stomatitis; *see also under Aminoglycosides*

Proprietary Preparations

see section 12.2.& 10.2.

STREPTOMYCIN[ED]

Indications: tuberculosis in combination with other drugs; plague, tularemia, adjunct to doxycycline in brucellosis, enterococci endocarditis

Cautions, Contra-indications, Side-effects: *see notes above*

Interactions: *see Appendix-2*

Dose: *deep IM inj. or IV inj*. ADULT tuberculosis, 15 mg/kg/d, CHILD 20-40 mg/kg/d, not to exceed 1-1.5 g/d; for intermittent supervised therapy 1-1.5 g twice or thrice weekly; bacterial endocarditis, 0.5 g twice daily; the dose is reduced in those under 50kg or those over 40 years or those with renal impairment

Note: one-hour ("peak") concentration should not exceed 40mg/litre; pre-dose ("trough") concentration should be less than 5 mg/litre (less than 1 mg/litre in

renal impairment or in those over 50 years of age)

Generic Preparations
Injection, 1gm/vial

TOBRAMYCIN

Indications: *see under Gentamicin*
Cautions: *see notes above;* For inhalation treatment: other inhaled drugs should be given before, bronchospasm monitoring with initial dose, measurement of peak flow before and after nebulization, if bronchospasm, test repeated with bronchodilator; renal function monitoring, severe hemoptysis
Contraindications, Side- effects: *see notes above*
Interactions: *see Appendix-2*
Dose: *IM or slow IV inj*. over 3-5 minutes or IV infusion, 5-6 mg/kg daily in divided doses every 8 hours; NEONATES 2 mg/kg every 12 hours; CHILD > 1 week 2-2.5 mg/kg every 8 hours; for chronic pulmonary *Pseudomonas aeruginosa* infection in cystic fibrosis patients, by inhalation of nebulized solution, ADULT & CHILD over 6 years, 300 mg every 12 hours for 28 days, courses repeated after 28-day interval

Note: one-hour ("peak") concentration should not exceed 10 mg/litre; pre-dose ("trough") concentration should be less than 2 mg/litre

Proprietary Preparations
see section 10.2.1

1.1.5 MACROLIDES

These are bacteriostatic (erythromycin may be bactericidal in high concentrations) antibiotics having antibacterial spectrum similar (not identical) to that of benzylpenicillin and are effective against gram-positive organisms including *pneumococci, streptococci, staphylococci and cornyebacteria. Also susceptible are mycoplasma, legionella, Chlamydia trachomatis, C. psittaci, C. pneumonia, helicobacter, listeria and Mycobacterium kansasii,* M. scrofulaceum. Of the gram-negative organisms *neisseria species, Bordetella pertussis, Bartonella henselae and B. Quintana* (agents of cat scratch disease and bacillary angiomatosis), some rickettsia species, *Treponema pallidum,* campylobacter and *H. influenzae* are susceptible. **azithromycin** and **clarithromycin** also have activity against *M. leprae and Toxoplasma gondii.* Azithromycin is most active against Chlamydia and least active against staphylo and streptococci. It has long half-life and single daily dose is adequate Against *H. influenzae* **erythromycin** is less active than both **azithromycin** and **clarithromycin.**
erythromycin base is destroyed by gastric acid and must be administered with enteric coating. After being absorbed, both azithromycin and clarithromycin are extensively distributed in tissues and secretions except the brain and CSF. Erythromycin, however, has limited distribution profile. Both renal and nonrenal routes are used in elimination, nonrenal being more prominent. Macrolides, except azithromycin, are drug-metabolizing enzymes inhibitors.

AZITHROMYCIN

Indications: same as that of Clarithromycin
Cautions, Contra-indications, Side-effects: *see under Erythromycin;* also anorexia, dyspepsia, photosensitivity, interstitial nephritis, acute renal failure, asthenia, paraesthesia, convulsions, Stevens-Johnson syndrome, toxic epidermal necrolysis and taste disturbances
Interactions: *see Appendix -2*
Dose: *oral & IV:* ADULT should be given 1 hour before or 2 hours after meal when administered orally, 500 mg on first day, then 250 mg/d for days 2 through 5; uncomplicated genital chlamydial infections and non-gonococcal urethritis: 1 g as a single dose; M. avium-intracellulare infection in AIDS patients,

for treatment 500 mg daily and for prevention 1200 mg once weekly; CHILD 10 mg/kg (max. 500 mg) on first day, then 5 mg/kg (max. 250 mg) for days 2 through 5

Proprietary Preparations

Acos *(Radiant),* Susp., 200mg/5ml, Tk. 175.00/30 ml; Tab., 500 mg, Tk. 55.00/Tab.
Amzith *(Amulet),* Susp., 200mg/5ml, Tk. 130.00/35 ml; Tab., 500 mg, Tk. 30.00/Tab.; Cap., 250 mg, Tk. 20.00/Cap.
Asizith *(Asiatic),* Susp., 200 mg/5 ml, Tk. 85.00/15 ml; Tk. 130.00/30 ml; Tab., 250 mg, Tk. 20.00/Tab.; 500 mg, Tk. 35.00/Tab.
Avalon *(Techno),* IV Infusion, 500 mg/Vial, Tk. 250.00/Vial; Susp., 200mg/5ml, Tk. 85.00/15 ml; Tk. 130.00/30 ml; Tab., 500 mg, Tk. 30.00/Tab.
AZ *(Aristo),* Cap., 250mg, Tk. 25.00/Cap.; 500mg, Tk. 35.00/Cap.; Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 35.00/Tab.; Susp., 200mg/5ml, Tk. 200.00/50 ml; Tk. 100.00/20 ml; Tk.140.00/35 ml
Azalid *(Orion),* Cap., 250 mg, Tk. 20.08/Cap.; Susp., 200 mg/5 ml, Tk. 85.32/15 ml; Tk. 130.49/35 ml; Tk. 160.00/50 ml; Tab. , 500 mg, Tk. 35.00/Tab.
Azaltic *(Nipro JMI),* Susp., 200mg/5ml , Tk. 85.00/15ml; Tk. 130.00/35 ml; Tab., 500 mg, Tk. 30.00/Tab.
Azasite *(Sharif),* Susp., 200mg/5ml, Tk. 85.00/20 ml; Tk. 130.00/35 ml; Tab., 500 mg, Tk. 30.00/Tab.
Azexia *(Pharmasia),* Susp., 200 mg/5 ml, Tk. 85.00/20ml; Tk. 130.00/35 ml; Tab., 500 mg, Tk. 30.00/Tab.
Azicin *(Opsonin),* Cap., 250 mg, Tk. 15.10/Cap.; 500 mg, Tk. 22.56/Cap.; Powder, 1 gm/Sachet , Tk. 60.15/Sachet; Susp., 200mg/5ml, Tk. 139.62/50 ml; Tk. 98.11/30 ml; Tk. 64.15/15 ml; Susp., 135 mg/5ml, Tk. 150.38/60ml; Tab., 250 mg, Tk. 15.10/Tab.; 500 mg, Tk. 26.32/Tab.
Azilab *(Labaid),* Susp., 200 mg/5 ml, Tk. 165.00/35 ml; Tab., 500 mg, Tk. 50.00/Tab.
Azimet *(Medimet),* Tab., 500mg, Tk.30.00/Tab.; Susp., 5mg/5ml, Tk.130.00/30 ml; Tk.85.00/15 ml
Azimex *(Drug Intl),* Susp., 200mg/5ml, Tk. 90/15ml; Tk. 130/30 ml; Tk. 185/50 ml; Tab., 250 mg, Tk. 25/Tab.; 500 mg, Tk. 35/Tab.
Azin, *(Acme),* Cap., 250 mg, Tk. 25.00/Cap.; Susp., 200 mg/5 ml, Tk. 185.00/50 ml; Tab., 500 mg, Tk. 30.11/Tab.
Azinil *(Apex),* Susp., 200 mg/5 ml, Tk. 185/50 ml; Tk.130/35 ml; Tk. 85/20 ml; Tab., 250 mg, Tk. 20/Tab.; 500 mg, Tk. 30/Tab.
Azirox *(Navana),* Susp., 200 mg/5 ml, Tk. 85/20 ml; Tk. 130/35 ml; 500 mg, Tk. 35/Tab.
Azithin *(Chemist),* Suspn., 5mg/5ml, Tk. 85.00/15 ml; Tk. 130.00/35 ml; Tab., 500mg, Tk. 26.25/Tab.
Azithral *(Globex),* Susp., 200mg/5ml, Tk. 130.00/30 ml; Tab., 500 mg, Tk. 30.00/Tab.
Azithro *(Astra),* Susp., 200mg/5ml, Tk. 140.00/35 ml; Tk. 95.00/15 ml; Tab., 500 mg, Tk. 30.00/Tab.
Azithrocin *(Beximco),* Cap., 250 mg, Tk. 25.00/Cap.; IV Infusion, 500 mg/Vial, Tk. 460.00/Vial; Susp., 200mg/5ml, Tk. 85.00/15 ml; Tk. 130.00/30 ml; Tk. 185.00/50 ml; Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk.35.00/Tab.
Azithromax *(Ziska),* Susp., 200 mg/5 ml, Tk. 85.00/ 15 ml; Tk. 130.00/ 35 ml; Tk. 185.00/ 50 ml ; Tab., 500mg, Tk. 30.00/Tab.
Azithromycin *(Albion),* Cap., 500 mg, Tk. 30.00/Cap.; Susp., 200mg/5ml, Tk. 85.00/15ml; Tk. 130.00/35ml; Tab., 500 mg, Tk. 30.00/Tab.
Azitor *(Central),* Susp., 200 mg/ 5 ml, Tk. 140.00/35ml; Tab., 500 mg, Tk. 30.00/Tab.
Azitra *(MST),* Susp., 20 ml, TK. 85/20 ml; Tk. 130/35 ml; Tk.185/50 ml; Tab., 500 mg, TK. 30 / Tab.
Azix *(Amico),* Susp., 200 mg/5 ml, Tk. 130/30ml; Tk. 85.00/15 ml; Tab., 500 mg, Tk. 30/Tab.
Azo *(Delta),* Susp., 200mg/5ml, Tk. 85.00/15 ml; Tk. 130.00/30 ml; Tab., 500 mg, Tk. 30.00/Tab.
Azomac *(General),* Paed. drops, Tk. 85.32/15 ml; Susp., 200 mg/5 ml, Tk. 100.00/20 ml; Tk. 140/35 ml; Tk. 185.00/50 ml; Tk. 130.49/35 ml; Tk. 185/50 ml; Tab., 500 mg, Tk. 30.00/Tab.
Azyth *(Novartis),* Susp., 200 mg/5 ml, Tk. 30.00/Cap.; Tk. 115.00/15 ml; Tk. 155.00/30 ml; Tk. 220.00/50 ml; Tab., 500 mg, Tk. 55.00/Tab.
Benzith *(Benham),* Cap., 500 mg, Tk. 25.83/Cap.; Susp., 200 mg/5 ml, Tk. 90.00/15 ml; Tk. 140.00/35 ml
Bro *(Bios),* Cap., 500 mg, Tk. 30.00/Cap.; Susp., 200mg/5ml, Tk. 95.00/15 ml
Cinalid *(Jayson),* Susp., 200mg/5ml, Tk. 75.28/15 ml; Tk. 130.00/35 ml; Tab., 500 mg, Tk. 30.00/Tab.
Curazith *(Sanofi),* Susp., 200mg/5ml, Tk. 85/15 ml;Tk. 130/30 ml; Tab.,250mg,Tk.20/Tab.; 500mg, Tk. 35/Tab.
Macazi *(Pacific),* Susp., 200mg/5ml, Tk. 48.12/15 ml; Tk. 88.72/35 ml; Tab., 500 mg, Tk. 26.32/Tab.
Macrobac *(Concord),* Susp., 200mg/5ml, Tk. 85/15 ml; Tk. 120.00/25 ml; Tk. 135.00/35 ml; Tk. 185/50 ml; Tab., 500 mg, Tk. 30.00/Tab.
Maczith *(Biopharma),* Cap., 250 mg, Tk. 25.00/Cap.; Tab., 500 mg, Tk. 35.00/Tab.; Susp., 200 mg/5 ml, Tk. 95/15 ml; Tk. 130.49/35 ml

Makzit *(Maks),* Susp., 200 mg/5 ml, Tk. 140.00/30 ml; Tab., 500 mg, Tk. 30/Tab.
My-Azi *(Doctor TIMS),* Tab., 500 mg, Tk. 35.00/Tab.
Myzid *(Ambee),* Tab., 250mg , Tk. 20/ Tab; 500 mg , Tk. 30/ Tab.
Novazith *(Leon),* Susp., 200mg/5ml, Tk. 80.00/15 ml; Tk. 135.00/35 ml; Tk. 185.00/50 ml; Tab., 500 mg, Tk. 35.00/Tab.
Odaz *(Unimed),* Susp., 200mg/5ml, Tk. 90.00/15 ml; Tk. 140.00/30 ml; Tab., 500 mg, Tk. 35.00/Tab.
Odazyth *(ACI),* Cap., 250mg, Tk. 20.08/Cap.; Tab. , 500mg , Tk. 35.00/Tab.; Susp., 200mg/5ml, Tk. 85.32/15 ml; Tk. 130.49/30 ml; Tk. 185.70/50 ml
Orgazith *(Organic),* Cap., 250 mg, Tk. 20.00/Cap.; Tab., 500 mg, Tk. 30.00/Tab.; Susp., 200 mg/5 ml, Tk. 85.00/20 ml; Tk. 130.00/35 ml; Tk. 185.00/50 ml
Penalox *(Rephco),* Cap., 250 mg, Tk. 30.00/Cap.; 500 mg, Tk. 30.00/Cap.; Susp., 200 mg/5ml, Tk. 95.00/15 ml; Tk. 130.00/30 ml; Tk. 130.00/35 ml
Ranzith *(Rangs),* Susp., 200mg/5ml, 85.00/15ml, 130.00/30ml ; Cap., 250mg, Tk. 20.00/Cap.; Tab., 500mg, Tk. 35.00/Tab.
Razithro *(RAK),* Tab., 500 mg, Tk. 35.00/Tab.; Susp., 200mg/5ml, Tk. 85.00/15 ml; Tk. 130.00/35 ml; Tk. 186.00/50 ml
Respazit *(Somatec),* Cap., 250 mg, Tk. 20.08/Cap.; Tab., 500 mg, Tk. 28.10/Tab.; Susp., 200 mg/5 ml, Tk. 80.30/15 ml; Tk. 130.49/50 ml
Romycin *(Ibn Sina),* Cap., 250 mg, Tk. 20/Cap.; Tab., 500 mg, Tk. 30/Tab.; Susp., 200mg/5ml, Tk. 90/15 ml; Tk. 100/20 ml; Tk. 135/35 ml; Tk. 190/50 ml
Rozith *(Healthcare),* Tab., 250mg, Tk. 25/Tab.; 500mg, Tk. 35/Tab.; Inj., 500 mg/Vial, Tk. 460/Vial; Susp., 200 mg/5 ml, Tk. 95/15 ml; Tk. 105/22.5 ml; Tk. 140/35 ml; Tk. 185/50 ml
Simpli *(Beacon),* Tab., 500 mg, Tk. 35/Tab.; Susp., 200mg/5ml, Tk. 85/20 ml; Tk. 130/35 ml; Inj., 500 mg, Tk. 450/Vial
Soto *(Hudson),* Suspn., 200mg/5ml, Tk.85/15ml, Tk.130/35ml; Tab., 500mg, Tk.30/Tab., Susp., 200 mg/5 ml, Tk. 120/30 ml
Tridosil *(Incepta),* Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 35.00/Tab.;Susp., 200 mg/5 ml, Tk. 85/15 ml; Tk 130.00/30 ml; Tk. 140.00/35 ml; Tk.185/50 ml; IV Infusion, 500 mg/vial, Tk. 460.00/Vial
Truzith *(White Horse),* Tab., 500 mg, Tk. 30/Tab.
Verizith *(Veritas),* Tab., 500 mg, Tk. 35/Tab.
Vinzam *(Ad-din),* Susp. , 200 mg/5ml, Tk. 130/35 ml; Tk. 75/15 ml; Tab., 500mg, Tk. 25/Tab.
Xolide *(Radiant),* Cap., 250 mg, Tk. 27/Cap.; 500 mg, Tk. 40/Cap.
Zeocin *(APC),* Tab., 500 mg, Tk. 30.00/Tab.; Susp., 200 mg/5 ml, Tk. 130.00/30 ml
Zibac *(Popular),* Tab., 250mg, Tk. 20.08/Tab.; 500 mg, Tk. 30.11/Tab.; Susp., 200 mg / 5 ml, Tk. 100 /20ml; Tk. 85.32/15ml; Tk. 15.00/25ml; Tk. 130.49/35ml; Tk.185.70/50ml; Inj., 500mg/Vial, Tk. 461.74/Vial
Zimax *(Square),* Cap., 250 mg, Tk. 25.00/Cap.; Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 35.00/Tab.; Susp., 200 mg / 5 ml, Tk. 85.33/15 ml; Tk. 130.49/30 ml; Tk. 185.69/50 ml; IV Infusion, 500 mg / vial, Tk. 460.00/Vial
Zinex *(Alco),* Tab., 250 mg, Tk. 20.00/Tab.; 500 mg, Tk.30/Tab.; Susp.,200mg/5ml, Tk.85/15 ml; Tk.130/30ml
Zita *(Kemiko),* Tab., 500 mg, Tk. 30.00/Tab.; Susp., 200 mg / 5 ml, Tk. 85.00/15 ml; Tk. 130.00/30ml; Tk. 185.00/50 ml
Zithracin *(Supreme),* Tab., 500mg, Tk. 35.00/Tab.; Susp., 200mg/5ml, Tk. 95.00/15 ml; Tk. 130.00/35 ml; Tk. 185.00/50 ml
Zithrin *(Renata),* Cap., 250 mg, Tk. 20.07/Cap., Tab., 250mg, Tk. 25.00/Tab.; 500 mg, Tk. 35.00/Tab; Susp., 200mg/5ml, Tk. 80.30/15 ml; Tk. 85.32/20 ml; Tk. 125.00/30 ml; Tk. 130.00/35 ml; Tk. 185.00/50 ml**;**,IVInfusion, 500 mg/Vial, Tk. 460.00/Vial
Zithrox *(Eskayef),* Tab., 250 mg, Tk. 20.00/Tab.; 500 mg , Tk. 35.00/Tab.; Susp., 200mg/5ml, Tk. 85/20 ml; Tk. 130.00/35 ml; Tk. 180.00/50 ml
Zycin *(Globe),* Powder for Suspn., 200 mg/5 ml, Tk. 185.00/50 ml; Tk. 120.00/30 ml; Tk. 80.00/15 ml

CLARITHROMYCIN

Indications: eradication of H. pylori, first-line therapy for prophylaxis and treatment of disseminated infection caused by *M. avium-intracellulare* in AIDS patients and for treatment of pulmonary infections in non-HIV-infected patients, toxoplasmosis encephalitis; *also see under Erythromycin*
Cautions: *see under Erythromycin;* dose reduction required in renal impairment
Contra-indications: see under Erythromycin
Interactions: *see Appendix-2*
Side-effects: *see under Erythromycin,* also reported headache, taste disturbances, tooth and tongue discoloration, stomatitis, glossitis, hepatitis and Stevens-Johnson syndrome; on IV infusion, local tenderness, phlebitis; less commonly ,

arthralgia and myalgia; rarely tinnitus; very rarely, dizziness, insomnia, nightmare, paraesthesia, convulsions, hypoglycemia, renal failure
Dose: *oral*: ADULT & CHILD > 12 years, 250 mg every 12 hours, increased in severe infections to 500 mg every 12 hours; CHILD < 12 years, 7.5 mg/kg twice daily; by IV infusion into larger proximal vein, 500 mg twice daily, CHILD not recommended

Proprietary Preparations
Binoclar *(Novartis),* Susp., 125 mg/5 ml, Tk. 395/60 ml; Tab., 500 mg, Tk. 66.00/Tab.;
Clamycin *(Biopharma),* Tab., 500 mg, Tk. 40.00/Tab.
Claricin *(Acme),* Tab.,250 mg,Tk. 25.10/Tab.; Tab., 500 mg, Tk. 40.15/Tab.
Clarimycin *(Amico),* Tab., 500 mg, Tk. 50.00/Tab.
Clarin *(Drug),* Tab., 250 mg, Tk. 25.00/Tab.; 500mg, Tk. 40.00/Tab.
Clarison *(Hudson),* Tab., 500mg, Tk.45/Tab.
Clacin *(Medimet),* Tab., 500mg, Tk.40.00/Tab.
Clarox *(Renata),* Tab., 250 mg, Tk. 25.00/Tab., 500mg, Tk. 40.00/Tab.
Klabex *(Opsonin),* Susp., 125 mg/5 ml, Tk. 226.42/60ml; 250 mg/5 ml, Tk. 226.42/35 ml; Tab., 250mg, Tk. 18.87/Tab.; 500 mg, Tk. 30.19/Tab.
Klabid *(Unimed),* Paed. drops, 125 mg/5 ml, Tk. 340.00/70 ml;Tab., 250 mg, Tk. 30.00/Tab.; 500 mg, Tk. 50.00/Tab.; ER Tab., 500 mg, Tk. 65.00/Tab.
Klarix *(Incepta)*Susp., 125 mg/5 ml, Tk. 340.00/60 ml; Tab., 250 mg, Tk. 25.00/Tab.; 500 mg, Tk. 40.00/Tab.
Maclar *(Techno),* Susp., 125 mg/5 ml, Tk. 310.00/60ml; Tab., 250 mg, Tk. 30.00/Tab.; 500 mg, Tk. 40.00/Tab.Inj.(IV Infusion), 500 mg, Tk. 300.00/Vial
Macrobid *(General),* Tab., 125 mg/5 ml, Tk. 50.19/Tab.
Remac *(Square),* Susp., 250 mg/5 ml, Tk. 340/60 ml; 500 mg, Tk. 40.15/Tab.

ERYTHROMYCIN[ED]

Indications: mycoplasma pneumonia infections, campylobacter enteritis, first line drug for chlamydial urogenital infections in pregnant women, chlamydial pneumonia, diphtheria, pertussis, legionnaires' disease, acne vulgaris (topical erythromycin preparations are used to treat acne); effective alternative to penicillins in hypersensitive patients for pharyngitis, scarlet fever, erysipelas and cellulitis due to *S. pyogenes,* for tetanus and for prophylaxis against recurrences of rheumatic fever
Cautions: hepatic and renal impairment; concomitant therapy with pimozide or terfenadine should be avoided; porphyria; in patients with a predisposition to QT interval prolongation; small amount secreted into breast milk, potential problems for nursing infant: modification of bowel flora, direct effects on the infant and interference with interpretation of culture results
Contra-indications: liver disease hypersensitivity
Interactions: *see Appendix-2*
Side-effects: nausea, vomiting, abdominal discomfort, diarrhea, antibiotic associated colitis, hypersensitivity reactions including urticaria, rashes, cholestatic jaundice and other reactions, reversible hearing loss after large doses, chest pain and arrhythmias including prolongation of QT interval and ventricular tachycardia
Dose: *oral*: ADULT & CHILD > 8 years, 250-500 mg every 6 hours or 0.5-1 g every 12 hours, up to 4 g daily in severe infections; CHILD up to 2 years, 125 mg every 6 hours, 2-8 years, 250 mg every 6 hours, doses doubled for severe infections; early syphilis, 500 mg 4 times daily for 14 days; uncomplicated genital chlamydia, non-gonococcal urethritis, 500 mg twice daily for 14 days; by IV infusion: ADULT & CHILD in severe infections, 50 mg/kg daily by continuous infusion or in divided doses every 6 hours; for mild infections when oral therapy not possible, 25 mg/kg daily

Proprietary Preparations
Adethro *(Supreme),* Susp., 125 mg/5 ml, Tk.60/100 ml; Tab., 500 mg, Tk. 8.00/Tab.
A-Mycin *(Aristo),* Susp., 250 mg/5 ml, Tk. 104.20/100ml; 125 mg/5 ml, Tk. 69.30/100 ml; Tab.,250 mg,Tk. 5.15/Tab.; 500 mg, Tk. 10.30/Tab. Paed drop, 200mg/5 ml, Tk.60/60ml
Arigram *(Central),* Susp., 125 mg/5 ml,Tk. 60/100 ml
BEZ *(Bios),* Tab., 500 mg, Tk. 8.50/Tab.; Susp.,125 mg/5 ml, Tk. 60.00/100 ml

E-bac *(Popular),* Susp., 125 mg/5 ml, Tk. 56.21/100ml
Emycin *(Medimet),* Susp., 125mg/5ml, Tk.61.00/100ml; Tab., 250mg, Tk.4.75/Tab.
Erixin *(Amico),* Paed. drops, 200 mg/5 ml , Tk. 60.00/60 ml; Tk. 40.00/40 ml ;Susp., 125 mg/5 ml, Tk. 60.00/100 ml
Ermac *(Opsonin),* Susp.,125 mg/5 ml, Tk. 46.09/100 ml
Ero *(Hudson),* Susp., 125mg/5ml, Tk.60.00/100 ml
Erocin *(Acme),* Susp., 125 mg/5 ml, Tk. 69.32/100 ml ; Tab., 250 mg, Tk. 5.16/Tab. ;500 mg, Tk. 10.32/Tab.
Erom *(Kemiko),* Susp., 125 mg/5 ml, Tk. 60/100 ml ; Tab., 250 mg, Tk. 4.85/Tab. ; 500 mg, Tk. 8.60/Tab.
Eromac *(General),* Susp.,125 mg/5 ml,Tk. 61.23/100 ml
Eromycin *(Square),* ;Paed. drops, 200 mg/5 ml, Tk. 60.22/60 ml ;Susp., 125 mg/5 ml, Tk. 69.32/100 ml; Tab. , 250 mg, Tk. 4.37/Tab.**;** DS Tab. , 500 mg, Tk. 10.32/Tab.
Eronix *(Ziska),* Susp., 125mg/5ml, Tk. 60.00/100ml
Erosa *(Biopharma),* Susp., 125 mg/5 ml , Tk. 55.21/100 ml; Tab., 250 mg, Tk. 4.52/Tab. ; 500 mg, Tk. 8.03/Tab.
Erosite *(Sharif),* Susp., 125 mg/5 ml, Tk. 69.32/100 ml
Errin *(Radiant),* Susp., 125 mg/5 ml, Tk. 60.00/100 ml
Ery *(Alco),* Tab., 250 mg, Tk. 4.00/Tab. ;Tab. , 500 mg, Tk. 7.00/Tab.; Susp, 125 mg/5 ml, Tk. 50.00/100 ml
Erybac *(Drug Int.),* Tab. , 250 mg, Tk. 4.00/Tab.; Tab., 500 mg, Tk.8.00/Tab.; Susp., 125 mg/5 ml, Tk.60.00/100 ml
Erycin *(Somatec),* Susp,125 mg/5 ml, Tk. 69.32/100 ml
Erymex *(Ibn Sina),* Susp, 125 mg/5 ml,Tk. 60.25/100 ml; Tab., 500 mg, Tk. 8.10/Tab.
Eryrox DS *(Navana),* Susp, 125 mg/5 ml, Tk. 60.22/100 ml
Erythin *(ACI),* Susp, 125 mg/5 ml, Tk. 61.29/100 ml
Erythromycin DS *(Albion),* Susp., 125 mg/5 ml, Tk. 60.00/100 ml; DS Tab., 500 mg, Tk. 7.50/Tab.
Erythromycin-A *(Ad-din),* Susp. , 125mg/5ml, Tk. 60.00/100 ml
Erythrox *(Renata),* Susp.,125 mg/5 ml,Tk.69.32/100 ml
Etrocin *(Beximco),* Susp., 125 mg/5 ml, Tk. 69.32/100ml; Tab.250 mg,Tk.4.80/Tab.;500 mg,Tk. 4.80/Tab.
Firmac *(Incepta),* Susp.,125 mg/5 ml,Tk. 60.00/100 ml
G-Erythromycin *(Gonoshasthaya),* Tab., 500 mg, Tk.15.00/Tab.
Mac *(Orion),* Susp., 125 mg/5 ml, Tk. 60.27/100 ml
Mac DS *(Orion),* Susp., 125 mg/5 ml, Tk.103.39/100ml; Tk. 74.27/70 ml
Macas *(Asiatic),* Susp.,125 mg/5 ml, Tk. 56.85/100 ml; Tab., 500 mg, Tk. 8.12/Tab.
Macery *(Pacific),*Tab., 250 mg, Tk. 3.38/Tab.; 500 mg, Tk. 6.17/Tab.; Susp.,125 mg/5 ml, Tk. 34.59/100 ml
Macrocin *(Sanofi),* Tab., 250 mg, Tk. 4.88/Tab.; Tab., 500 mg, Tk. 8.66/Tab.; Susp., 125 mg/5 ml, Tk. 61.00/100 ml ;
Makcin *(Techno),* Susp., 125 mg/5 ml,Tk. 50.00/100 ml
Mycin *(Ambee)* Tab., 500 mg, Tk.8.03/Tab; Suspn. , 125mg / 5 ml , Tk. 60.22/ 100ml
Pedicin *(Rangs),* Susp., 125 mg / 5 ml, Tk. 61.25/100 ml;
Throcin *(Globe),* Susp., 125 mg /5 ml, Tk. 56.00/100 ml; Tab., 500 mg, Tk. 4.00/Tab.
Zerobac *(Chemist),* Susp., 125mg/5ml, Tk. 60.00/100 ml
Zuracyn *(Rephco),* Susp., 125 mg/5 ml, Tk. 61.07/100ml; Tab. 500 mg, Tk. 8.50/Tab.

ROXITHROMYCIN

Indications: as for erythromycin
Cautions: as for erythromycin
Interactions: *see Appendix -2*
Contra indication: liver disease
Side-effects: gastrointestinal disturbances, Increase in liver enzyme values and hepatitis; rashes and other hypersensitivity reactions; headache, dizziness, weakness, reversible pancreatitis, eosinophilia
Dose: *by mouth*, ADULT 150mg twice daily, or sometimes 300mg once daily, before meals, in the treatment of susceptible infections. CHILD up to 40kg bodyweight, a dose of 5-8mg per kg daily before meals may be used

Proprietary Preparations

A-Rox *(Ambee),* Susp., 50 mg/5 ml, Tk. 45.17/50ml; Tab., 150 mg, Tk. 6.53/Tab; 300 mg, Tk. 11.04/Tab
Pedilid *(Incepta),* Susp., 50mg/5 ml, Tk. 50.00/50 ml; Tab., 150 mg, Tk. 7.00/Tab.; 300 mg, Tk. 14.00/Tab.
Rocky *(Amico),* Susp., 50 mg/5 ml , Tk. 40.00/50 ml; Tab. 150 mg, Tk. 7.00/Tab.; 300 mg, Tk. 12.00/Tab.
Rolid *(Globe),* Tab., 300 mg, Tk. 14.00/Tab; 150 mg, Tk. 7.00/Tab.; Susp., 50 mg/5 ml, Tk. 45.00/50 ml

Rotomycin *(Kemiko),* Tab. , 300 mg, Tk. 14.00/Tab.
Roxcin *(Alco),* Tab. , 150 mg, Tk. 7.00/Tab. ; 300 mg, Tk. 14.00/Tab.; Susp., 50 mg/5 ml Tk. 50.00/50 ml
Ryth *(Navana),* Tab., 150 mg, Tk. 7.03/Tab.; 300 mg, Tk. 14.05/Tab.;Susp., 50 mg/5 ml , Tk. 50.19/50 ml;Tk. 100.38/100 ml

SPIRAMYCIN

Spiramycin is a macrolide antibiotic with actions similar to those of erythromycin.

Indications: respiratory tract infections, genital infections, skin and soft tissue infections caused *by streptococci, pneumococci and meningococci,* diphtheria, prophylaxis of fetus against transmission of maternal toxoplasmosis in pregnancy

Caution: breast-feeding

Contra-indications: known hypersensitivity to macrolides

Side-effects: nausea, vomiting, diarrhea, allergic skin reactions

Dose: *oral*: ADULTS 6 to 9 million IU/day in 2 to 3 divided doses. CHILD weighing more than 20kg, 0.15 million IU per kg body weight per day, to be divided into 2 to 3 doses.
Note: the dosage does not need to be modified in patients with renal impairment; the drug can be prescribed safely in pregnancy; 3200 international units (IU) of spiramycin is equivalent to 1 mg

Proprietary Preparation
Rovamycin *(Sanofi),* Tab., Tk.20.00/Tab.

1.1.6 TETRACYCLINES

They are broad-spectrum bacteriostatic antibiotics with activity against wide range of aerobic and anaerobic gram-positive and gram-negative bacteria, r*ickettsiae, chlamydia, legionella, mycoplasma,* atypical mycobacteria, and spirochaetes and against some protozoa. But their use has decreased because of increasing emergence of resistance. In general, they are more active against gram-positive than gram-negative organisms. Most strains of *enterococci* and *pseudomonas aeruginosa* are resistant, although most of pseudomonas pseudomallei (causative agent of melioidosis) are sensitive. Also susceptible are *hemophilus ducreyi* (chancroid), *brucella*, *vibrio cholerae*, *legionella pneumophilia*, *campylobacter jejuni*, *helicobacter pylori*, *yersinia pestis*, *yersinia enterocolitica* and *actinomyces*. A variable number of anaerobes i.e. bacteroids spp. are sensitive to tetracyclines particularly to doxycycline, the most active congener. Doxycycline, however, is less active against *B. fragilis* than are chloramphenicol, clindamycin, metronidazole, ticarcillin and cefoxitin. The antimicrobial activities of most tetracyclines are similar except that of minocycline which exhibits activity against *Neisseria meningitides* and against most organisms resistant to other tetracyclines.
Oral bioavailability is lowest for chlortetracycline (30%), intermediate for oxytetracycline, demeclocycline and tetracycline (60-80%), and high for doxycycline and minocycline (95-100%). Tetracyclines chelate divalent and trivalent metal ions which can impair their oral absorption. These drugs distribute widely into prostate, bone marrow, bone, dentine, enamel of unerupted teeth and reticuloendothelial cells of liver. Penetration into CSF, synovial fluid, mucosa of maxillary sinus, and fetal circulation is excellent. Relatively high concentrations also are found in breast milk. Primary route of elimination of these drugs except that of doxycycline, is the kidney.
Cautions: gastrointestinal distress, nausea and vomiting can be minimized by giving these drugs with food but should not be ingested with dairy products, antacids containing **calcium, aluminum, zinc, magnesium or silicate, vitamins with iron, sucralfate, bismuth subsalicylate, cholestyramine and colestipol;** unused supplies of these antibiotics should be discarded.

Contra-indications: pregnant patients and to patients with renal insufficiency (doxycycline may be given). Neither they are recommended for lactating mother and for treatment of common infections in children under the age of 8 years.
Side-effects: epigastric burning and distress, abdominal discomfort, nausea, vomiting and diarrhea may occur. Esophagitis, esophageal ulcers and pancreatitis have been reported. Photosensitivity particularly with demeclocycline and doxycycline also is seen. Children may develop permanent brown discoloration of teeth. This risk is highest when tetracycline is given to neonates, babies prior to first dentition and to pregnant mothers. Tetracyclines are potentially hepatotoxic, pregnant women are particularly susceptible to this risk. Oxytetracycline and tetracycline appear to be less hepatotoxic. **minocycline** has relatively greater risk of systemic lupus-erythromatosus like syndrome and causes irreversible pigmentation.
These drugs can be deposited in skeleton throughout childhood. Long-term therapy may produce leukocytosis, atypical lymphocytes, toxic granulation of granulocytes and thrombocytopenic purpura. Increased intracranial pressure and tense bulging of fontanels (pseudomotor cerebri) in young infants are in reports. Renal tubular acidosis, proteinuria, aminoaciduria glycosuria - a form of Fanconi syndrome, has been seen after outdated tetracyclines ingestion. Hypersensitivity reactions, though rare, may follow the use of any of the tetracyclines and includes morbilliform rashes, urticaria, fixed drug eruptions, generalized exfoliative dermatitis and severe reactions like angioedema and anaphylaxis. Hypersensitivity to one tetracycline generally confers cross-reactivity to all other members of this class. Therapy with tetracyclines may lead to the superinfections that result in intestinal functional disturbances, anal pruritus, vaginal or oral candidiasis or enterocolitis with shock and death. Pseudomembranous colitis due to an overgrowth of toxin producing C. difficile is particularly relevant.

DEMECLOCYCLINE

Indications: *see under tetracycline* (except eye infections); also chronic inappropriate secretion of antidiuretic hormone
Cautions, Contra-indications: *see notes above*
Side-effects: *see notes above*; also reversible nephrogenic diabetes insipidus
Dose : *oral*: 150 mg every 6 hours or 300 mg every 12 hours; CHILD> 8 years, 6-12 mg/kg in 2-4 divided doses

Generic Preparations
Tablet, 150 mg; 300 mg

DOXYCYCLINE[ED]

Indications: chronic prostatitis, sinusitis, malaria treatment and prophylaxis, pelvic inflammatory disease (with metronidazole); brucellosis (with rifampicin), adjunct to gingival scaling and root planning for periodonititis; also see under tetracycline (except eye infections)
Cautions, Contra-indications: *see notes above*

Interactions: *see Appendix-2*
Side-effects: *see notes above;* also vestibular reactions including anorexia, dizziness, tinnitus and vertigo
Dose : ORAL: 200 mg on first day, then 100 mg daily; severe infections including refractory urinary tract infections, 200 mg daily; early syphilis, 200 mg daily in 1-2 divided doses for 14 days; late latent syphilis, 100-200 mg twice daily for 28 days; uncomplicated genital chlamydia, non-gonococcal urethritis, 100 mg twice daily for 7 days; by IV infusion: 200 mg in one or two infusions on first day followed by 100-200 mg on subsequent days

Proprietary Preparations
Asidox *(Asiatic),* Cap.,100 mg, Tk. 2/Cap.
Dopac *(Pacific),* Cap.,100 mg, Tk. 1.50/Cap.

Doxacil *(Square),* Cap.100 mg, Tk. 2/Cap.
Doxcline *(Alco),* Cap.,100 mg, Tk. 2/Cap.
Doxeem*(Maks),* Cap.,100 mg, Tk. 2.20/Cap.
DoxiCap *(Renata),* Cap.,100 mg, Tk. 2.20/Cap.; 50mg, Tk.1.42/Cap.
Doxicen*(Central),*Cap.,100mg,Tk. 2.20/Cap.
Doxicline *(Ziska),* Cap.,100mg, Tk. 2/Cap
Doxico*(Supreme),* Cap.,100mg, Tk. 2/Cap.
Doxigen*(General),* Cap., 100 mg, Tk. 2.16/Cap.
Doxilin *(Ambee),* Cap.,100 mg, Tk. 2.13/Cap
Doximet *(Medimet),* Cap., 100mg, Tk.2.20/Cap.
Doxin *(Opsonin),* Cap.,100 mg, Tk.1.66/Cap.; Cap., 50 mg, Tk. 1.08/Cap.
Doxy-A *(Acme),* Cap., 100 mg, Tk. 2.19/Cap.
Doxycycline *(Popular),* Cap., 100 mg, Tk. 1.50/Cap.
Doxysina *(Ibn Sina),* Cap., 100 mg, Tk. 2.03/Cap.
Doxyson *(Hudson),* Cap., 100mg, Tk.1.90/Cap.
DyCap*(Albion),* Cap., 100 mg, Tk. 1.75/Cap.
G-Doxycycline *(Gonoshasthaya),* Cap.,100 mg, Tk.1.50/Cap.
Impedox *(ACI),* Cap., 100 mg, Tk. 2.16/Cap.
Megadox*(Beximco),* Cap.,100 mg,Tk. 2.16/Cap.
Monadox *(Amico),* Cap.,100mg, Tk. 2.50/Cap.
Oriodox *(Orion),* Cap.,100 mg, Tk. 2.11/Cap.
Unidox *(Globe),* Cap.,100 mg, Tk. 2.50/Cap.
Vidox *(Jayson),* Cap.,100 mg, Tk. 2/Cap.

OXYTETRACYCLINE

Indications: *see under Tetracycline*
Cautions: *see notes above;* also porphyria
Contra-indications, Side-effects: *see notes above*
Dose: ORAL: 250-500 mg every 6 hours; acne, 500 mg twice daily for 4-6 months, up to 2 years or longer in severe cases

Proprietary Preparations
Oxecylin *(Acme),* Cap., 250 mg, Tk. 2.00/Cap.
Renamycin *(Renata),* Cap., 250 mg, Tk. 2.00/Cap.

TETRACYCLINE [ED]

Indications: *mycoplasma pneumonia, chlamydial pneumonia, lymphogranuloma venereum, trachoma, rickettsial* infections (epidemic typhus, scrub typhus, rickettsial pox, Q fever), uncomplicated gonococcal infections, syphilis, brucellosis, exacerbations of chronic bronchitis, acne, actinomycosis, lyme disease, tularemia, cholera, eye infections (conjunctivitis, blepharitis)

Cautions, Contra-indications: *see notes above;* also hepatic impairment

Side-effects: see *notes* above
Interactions: *see Appendix-2*
Dose: *oral*: 250 mg every 6 hours for mild to moderate infections, increased in severe infections to 500 mg every 6-8 hours; primary, secondary, or early latent syphilis, 500 mg every 6 hours for 14 days; non-gonococcal urethritis, 500 mg every 6 hours for 7-14 days (21 days if failure or relapse after first course); acne, 500 mg twice daily for 4-6 months, up to 2 years or longer in severe cases; topical: 1% solution, 2-4 drops 4-6 hourly, every hourly in severe cases

Proprietary Preparations
A-Tetra *(Acme),* Tab., 500 mg, Tk. 2.29/Tab.; Cap., 500mg, Tk. 2.03/Cap.
G-Tetracycline*(Gonoshasthaya),* Cap., 250 mg, Tk.1.00/Cap.;
Jmycin *(Jayson),* Cap., 250 mg, Tk. 1.31/Cap.
Monatrex *(Amico),* Cap., 250 mg, Tk. 1.20/Cap.; DS Cap., 500 mg, Tk. 2.00/Cap.
Tetclin*(Pacific),* Cap., 250 mg, Tk. 0.75/Cap.
Tetra *(Albion),* Cap., 250 mg, Tk. 0.80/Cap.
Tetragen *(General),* Cap., 250 mg, Tk. 1.36/Cap.
Tetramycin*(Asiatic),*Cap.,250mg,Tk. 1.30/Cap
Tetrasina*(Ibn Sina),* Cap., 250 mg, Tk. 1.37/Cap.; 500mg, Tk. 2.25/Cap.
Tetrax *(Square),* Cap., 500 mg, Tk. 2.28/Cap.
Titacin *(Supreme),* Cap., 250 mg, Tk. 1.30/Cap.; 500mg, Tk. 2.00/Cap.
Tetracycline-H *(Hudson)*, Cap. 250 mg, Tk. 1.00/Cap.
Tetram *(Ambee)*, Cap. 250 mg, Tk. 1/Cap.
Tetramet *(Medimet)*, Cap. 250 mg, Tk. 1.00/Cap.

1.1.7. QUINOLONES AND FLUOROQUINOLONES

(see section 10.2)

The older agents are 4-quinolones (**nalidixic acid**, **cinoxacin**) with narrower spectrum of antimicrobial activity and the newer drugs are fluorinated analogs with broad spectrum of activity and much wider tissue distribution. The quinolones are effective against enteric gram-negative bacilli; *P.*

aeruginosa is resistant. Fluorinated analogs have greatly improved antibacterial activity against many gram-positive and gram-negative organisms. **ciprofloxacin, enoxacin, lomefloxacin, levofloxacin, ofloxacin** and **pefloxacin** are similar agents having excellent activity against aerobic gram-negative organisms. **clinafloxacin, gatifloxacin and sparfloxacin** comprise another group of fluoroquinolones with improved activity, clinafloxacin being the best, against gram-positive organisms, particularly *S. pneumonia* and *staphylococci.* Fluoroquinolones also are active against agents of atypical pneumonia like mycoplasmas, *Chlamydia* and intracellular pathogens, such as legionella and some mycobacteria. Resistance to one fluoroquinolone usually confers cross-resistance to all other members of this class.

Cautions and **Contra-indications:** dose adjustment in patients with creatinine clearance less than 50 ml/min. is required for cinoxacin, norfloxacin, ciprofloxacin, ofloxacin, enoxacin and lomefloxacin but not for nalidixic acid, trovafloxacin and pefloxacin. Cautions are required in pregnancy, nursing mother and the non-renally cleared fluoroquinolones in patients with hepatic failure. These drugs are not generally recommended for use in prepubertal children, although in some cases the benefits may outweigh the risks and requires careful assessment. Quinolones are contra-indicated in patients with history of tendon disorders related to quinolones. In presence of epilepsy and myasthenia gravis cautious administration is required. These drugs should be withdrawn if psychiatric, neurological, tendinitis or hypersensitivity reactions occur.

Side-effects: gastrointestinal upset in the form of mild nausea, vomiting, and/or abdominal discomfort, rarely diarrhea and antibiotic-associated colitis. Central nervous system side effects including headache, dizziness have been reported, photosensitivity with lomefloxacin and pefloxacin. Reversible arthopathy and joint swelling have developed in children receiving fluoroquinolones. Tendinitis, a rare complication seen in adults.

Note. to prevent emergence of resistance, fluoroquinolones should be reserved for organisms resistant to other drugs.

CIPROFLOXACIN[ED]

Indications: urinary tract infections, pseudomonal lower respiratory infections except pneumococcal pneumonia, enteric fever, shigellosis, gonorrhea, chancroid, prostatitis, septicemia, bone, joints and soft tissue infections, traveler's diarrhea, superficial bacterial infections of eye caused by sensitive organisms, second line drug for legionellosis, with an anti-anaerobic (clindamycin or metronidazole) for pelvic inflammatory disease, part of multidrug therapy for multidrug-resistant tuberculosis, with amoxicillin-clavulanate as an oral empiric therapy for fever in low-risk patients with granulocytopenia secondary to cancer chemotherapy, eradication of meningococci from carriers, surgical prophylaxis and prophylaxis of infection in neutropenic patients

Cautions and **Contra-indications:** excessive alkalinity of urine should be avoided, adequate fluid intake required to avoid crystalluria, performance of skilled tasks like driving may be impaired (effects enhanced by alcohol); also *see Notes above*

Side-effects: *see notes above*; also flatulence, dysphagia, hyperglycemia, alerted prothrombin concentration, vasculitis, erythema nodosum, petechiae, hemorrhagic bullae, tinnitus, tenosynovitis, tachycardia, edema, syncope, hot flushes and sweating; pain and phlebitis at injection site

Interactions: *see Appendix-2*

Dose: *oral*: urinary-tract infections, 250-500 mg twice daily; 100 mg twice daily for 3 days in acute uncomplicated cystitis in women; chronic prostatitis, 500 mg

twice daily for 28 days; gonorrhea, 500 mg as a single dose; pseudomonal lower respiratory-tract infection in cystic fibrosis, 750 mg twice daily; most other infections, 500-750 mg twice daily; surgical prophylaxis, 750 mg 60-90 minutes before procedure; CHILD (not recommended but where benefit outweighs risk), 5-17 years, up to 20 mg/kg twice daily, max. 1.5 g daily; IV infusion, over 30-60 minutes; 200-400 mg twice daily; pseudomonal lower respiratory tract infection in cystic fibrosis, 400 mg twice daily; CHILD 5-17 years, up to 10 mg/kg 3 times daily, max. 1.2 g daily; urinary-tract infections, 100 mg twice daily; gonorrhea, 100 mg as a single dose;

IV infusion: over 30-60 minutes, 200–400mg twice daily.

Proprietary Preparations

Amiflox *(Amico),* Tab. , 750 mg, Tk. 16.00/Tab.;Tab., 250 mg, Tk. 6.00/Tab.;Tab. , 500 mg, Tk. 10.00/Tab.; Susp., 250 mg/5 ml, Tk. 85.00/60 ml
Ancipro *(Unimed),* Tab. , 250 mg, Tk. 8.50/Tab; 500 mg, Tk. 14.00/Tab.; 750 mg, Tk. 18.00/Tab.
Aprocin *(Aristo),* Susp., 250 mg/5 ml,Tk. 100/60 ml**;** Tab. , 250 mg, Tk. 8.50/Tab. :, 500 mg, Tk. 14.00/Tab.; 750 mg, Tk. 18.00/Tab.
Bactin *(Ibn Sina),* Tab. , 250 mg, Tk. 8.54/Tab. ;500 mg, Tk. 14.06/Tab. ;750 mg, Tk. 18.06/Tab.*;* Inj (IV Infusion), 0.20%,Tk. 145.00/100 ml
Benprox *(Benham),* Tab. 750 mg, Tk. 18.00/Tab. ;Tab., 500 mg, Tk. 14.00/Tab.
Beuflox *(Incepta),* Susp., 250 mg/5 ml, Tk. 100.00/60 ml; Tab. , 250 mg, Tk. 8.50/Tab.;500 mg, Tk. 15.00/Tab.;750 mg, Tk. 18.00/Tab.;Inj (IV Infusion), 0.20%, Tk. 70.00/100 ml
Ceprocon *(Concord),* Susp., 250 mg/5 ml, Tk. 90.00/60 ml ; Tab., 500 mg, Tk. 12/Tab.
Cifloci *(Astra),* Tab., 500 mg, Tk. 12.00/Tab.
Cilocin *(Pacific),* Susp., 250 mg/5 ml, Tk. 75.19/60 ml; Tab., 500 mg, Tk. 6.02/Tab.; Tab., 500 mg, Tk. 6.02/Tab.
Cip *(Asiatic),* Tab. , 500 mg, Tk. 14.00/Tab.; 750 mg, Tk. 18.00/Tab.
Cipcin *(Biopharma),* Inj., (IV Infusion), 0.20%, Tk. 100.00/100 ml ;Susp., 250 mg/5 ml, Tk. 90.34/60 ml; Tab. , 250 mg, Tk. 8.53/Tab. ; 500 mg, Tk. 14.05/Tab.; 750 mg, Tk. 18.07/Tab.
Ciplon *(Techno),* Tab., 500 mg, Tk. 14.00/Tab. DS Inj., (IV Infusion), 0.40%,, Tk. 145.00/100 ml;, 0.20%, Tk. 95/100 ml
Cipoxia *(Pharmasia),* Susp., 250 mg/5 ml, Tk. 100/35 ml Tab. , 500 mg, Tk. 14/Tab.
Cipro-A *(Acme),* Inj., (IV Infusion), 0.20%, Tk. 90.34/100 ml ; Susp., 250 mg/5 ml ,Tk. 100/60 ml ;, Tab., 250 mg, Tk. 8.53/Tab.; 500 mg, Tk. 14.06/Tab.; 750 mg, Tk. 18.06/Tab.
Ciproaid *(Labaid),* Tab. , 500 mg, Tk. 15.00/Tab.
Ciprob *(Bios),* Susp., 250 mg/5 ml, Tk. 90.00/60 ml; Tab. , 500 mg, Tk. 12.00/Tab.
Ciprobey *(Sharif),* Susp., 250 mg/5 ml,Tk. 90.00/60ml ; Tab. 500 mg, Tk. 14.00/Tab.
Cipro-C *(Chemist),* Susp. Tk. 100.00/60 ml; 500 mg, Tab.,Tk. 6.70/Tab.
Ciprocap *(Sonear),* Cap., 500 mg, Tk. 14.35/Cap.; 250 mg, Tk. 8.71/Cap.
Ciprocin *(Square),* Inj.,(IV Infusion), 0.20%, Tk. 100.00/100 ml ; Susp., 250 mg/5 ml, Tk. 100.00/60 ml ; Tab. , 250 mg, Tk. 8.54/Tab.; 500 mg, Tk. 15.00/Tab. 750 mg, Tk. 18.06/Tab.; XRTab. , 1000 mg, Tk. 20.07/Tab.
Ciprofloxacin *(Albion),* Tab. , 750 mg, Tk. 18.00/Tab.; 250 mg, Tk. 8.50/Tab.; 500 mg,Tk. 14.00/Tab. DS Susp.,250 mg/5 ml, Tk. 80.00/60ml
Cipromet *(Medimet),* Tab., 250mg, Tk.6.00/Tab; 500mg, Tk.10.00/Tab.
Ciprotec *(APC),* Susp., 250 mg/5 ml, Tk. 80.00/60 ml ; Tab., 500 mg, Tk. 8.00/Tab.
Ciprotim *(Doctor TIMS),* Tab. , 500 mg, Tk. 14.00/Tab.
Ciprox *(Opsonin),* Inj., (IV Infusion), 0.20%,Tk. 52.83/100 ml; Susp.,250 mg/5 ml, Tk. 67.92/60 ml;Tab., 250 mg , Tk. 6.41/Tab.;500 mg, Tk. 11.28/Tab.;750 mg, Tk. 13.59/Tab. DS Susp., 250 mg/5 ml, Tk. 75.19/60 ml; ER., 1000 mg, Tk. 15.10/Tab.
Ciproxen *(Ad-din),* Tab., 250mg, Tk. 7.00/Tab.; 500mg, Tk. 14.00/Tab.
Ciproxim *(White Horse),* Tab. , 500 mg, Tk. 12.00/Tab.
Ciproxy IV *(Opso Saline),* Inj., (IV Infusion), 0.20%,Tk. 52.83/100 ml
Ciprozid *(Drug Int),* Susp., 250 mg/5 ml, Tk. 90.00/60 ml; Tab.,250 mg, Tk. 8.00/Tab; 500 mg, Tk. 15.00/Tab.;750 mg, Tk. 16.00/Tab.ERTab.,1000 mg, Tk. 20.00/Tab.
Civox *(Popular),* Susp., 250 mg/5 ml, Tk. 90.34/60 ml;
Civox IV , *(Popular),* Inj., (IV Infusion), 0.20%,Tk. 75.00/100 ml,
DFX *(Delta),* Susp., 250 mg/5 ml, Tk. 90.00/60 ml; Tab., 500 mg, Tk. 10.00/Tab.
DS Susp., 250 mg/5 ml, Tk. 90.00/60 ml
Dumaflox*(Alco),* Susp., 250 mg/5 ml, Tk. 65.00/60 ml; Tab. , 250 mg, Tk. 7.50/Tab; 500 mg, Tk. 10/Tab.; 750 mg, Tk. 12/Tab.
Fiprox *(Sanofi),* Tab., 250 mg, Tk. 8.53/Tab.; 500 mg, Tk. 14.05/Tab.;750 mg, Tk. 18.07/Tab.
Flocip *(Amulet),* Susp., 250 mg/5 ml, Tk. 90.00/60 ml ; Tab. , 500 mg, Tk. 14.00/Tab.

Flontin *(Renata,),* Susp., 250 mg/5 ml, Tk. 100.00/60 ml ;Tab. , 250 mg, Tk. 8.53/Tab.;500 mg, Tk. 15.00/Tab.; Tab. , 750 mg, Tk. 18.06/Tab. ;Inj., (IV Infusion), 0.20%,Tk. 145.54/100 ml
Florocin*(NiproJMI),* Susp.,250mg/5ml ,Tk. 90.00/60 ml ; Tab. , 500 mg, Tk. 12.05/Tab.
Floxabid *(ACI),* Tab. , 250 mg , Tk. 8.53/Tab.,;500 mg , Tk. 14.05/Tab., ;750 mg Tk. 18.07/Tab.*;* Susp., 250 mg/5 ml , Tk. 90.34/60 ml SR. *,* Tab. , 1000 mg , Tk. 20.07/Tab.
Floxacin *(Navana),*Susp., 250 mg/5 ml, Tk. 90.00/60 ml;, Tab., 250 mg, Tk. 7.00/Tab.; 500 mg, Tk. 12/Tab.
Floxa-Mak *(Maks),* Tab. , 500 mg, Tk. 14.00/Tab.
G-Cipro *(Gonoshasthaya),* Inj., (IV Infusion), 0.20%,, Tk. 62.00/100 ml;Tab. , 500 mg, Tk. 10.00/Tab.
Geflox *(General),* Inj., (IV Infusion), 0.20%,Tk. 70.00/100 ml;Susp., 250 mg/5 ml, Tk. 80.30/60 ml;Tab. , 250 mg, Tk. 8.50/Tab.; 500 mg, Tk. 14.05/Tab.
Glaxipro *(GSK),* Tab. , 500 mg, Tk. 12.36/Tab.
Hiflox *(Ambee) ,* Suspn. , 250 mg/5ml, Tk. 70.26/60ml; Tab., 500 mg, Tk. 8.7/Tab; 750 mg , Tk.12.05/Tab; XR Tab., 1000 mg , Tk.20/ Tab
Hi-floxin *(Hudson),* Susp., 250mg/5ml, Tk.90.00/60 ml; Tab., 500mg, Tk.12.00/Tab.
Kapron *(Globe),*Inj., *(*IV Infusion), 0.20%,, Tk. 90.00/100ml; Susp. 250 mg/5 ml, Tk. 90.00/60 ml; Tab., 750 mg, Tk. 18.00/Tab.; 500 mg, Tk.15.00/Tab.; Tab., 250 mg, Tk. 8.00/Tab.
Libracin *(Libra),* Inj., (IV Infusion), 0.20%,Tk. 70.26/100 ml ; Inj., 0.40%, Tk. 146.30/100 ml
Maprocin *(Orion),* Susp., 250 mg/5 ml, Tk. 90.34/60 ml ;Tab., 500 mg, Tk. 14.05/Tab; 750 mg, Tk. 18.06/Tab.
Maprocin *(Orion),* Inj., (IV Infusion), 0.20%, Tk. 70.26/100 ml DS 0.40%,Tk.130.49/100ml
Neoflox *(Central),* Tab., 500 mg, Tk.12/Tab.
Neofloxin *(Beximco),* Tab. , 250 mg, Tk. 8.50/Tab. ; 500 mg, Tk. 15.00/Tab. ;500 mg, Tk. 14.00/Tab. ;750 mg, Tk. 18.00/Tab. Susep., 250 mg/Sachet , Tk. 12.00/Sachet ; 250 mg/5 ml, Tk. 100.00/60 ml ;Inj., (IV Infusion), 0.20%,Tk. 146.50/100 ml; XR Tab. 1000 mg, Tk. 25.00/Tab.
Novaflox *(Leon),* Susp., 250 mg/5 ml, Tk. 90.00/60 ml; 500 mg, Tk. 14.00/Tab.
Octabid *(Rephco),* Tab.,500 mg, Tk. 12/Tab.
Orcipro *(Organic),*Tab., 500 mg, Tk. 14/Tab.
Pancipro *(Globex),* Tab. , 500 mg, Tk. 14/Tab. Susp., 250 mg/5 ml, Tk. 100/60 ml
Procin *(Kemiko),* Susp., 250 mg/5 ml, Tk. 90.00/60 ml;Tab. , 250 mg, Tk. 8.50/Tab.; 500 mg, Tk. 14.00/Tab.;750 mg, Tk. 18.00/Tab.
Quinocin *(Veritas),* Tab., 500 mg,Tk. 14/Tab.
Quinox *(Eskayef),* Inj., (IV Infusion), 0.20%,, Tk. 100.00/100 ml ;Tab, 250 mg, Tk. 8.50/Tab.; 500 mg, Tk. 14.00/Tab.;Tab, 500 mg, Tk. 14/Tab.; 750 mg, Tk. 18/Tab.
Quintor *(Ziska),* Susp., 250mg/5ml, Tk.60.00/60ml; Tab., 500mg, Tk.10.00/Tab.
Raciprox *(RAK),* Susp., 250 mg/5 ml, Tk.100/60 ml;Tab., 500 mg, Tk. 15/Tab.
Ranflox *(Rangs),* Tab., 500mg, Tk. 14.00/Tab.; 750mg, Tk. 18.00/Tab.
Rocipro *(Healthcare),* Tab., 500 mg, Tk. 14.00/Tab.;750 mg, Tk. 18.00/Tab.;
Serviflox *(Novartis),* Tab., 500 mg, Tk. 14.00/Tab.; 750 mg, Tk. 18.00/Tab.
Spectra *(Jayson),* Tab., 500 mg, Tk. 10.16/Tab.
Sypron *(MST),* Susp, 5 gm/100 ml, Tk. 85/60ml; Tab., 500 mg, Tk. 12.50/Tab.
Tyflox *(Somatec),* Susp., 250 mg/5 ml, Tk. 100.00/60 ml ; Tab. , 500 mg , Tk. 12.04/Tab.
Winbac *(Radiant),* Tab., 500 mg, Tk.16/Tab.
Xbac *(Beacon),* Inj., (IV Infusion), 0.20%,Tk. 144.99/100 ml Susp., 250 mg/5 ml, Tk. 90.00/60 ml; Tab., 500 mg, Tk. 14.00/Tab. ; 750 mg, Tk. 18.00/Tab.
XRTab 1000 mg, Tk. 25.09/Tab.

GEMIFLOXACIN

Indications: treatment of community-acquired pneumonia (CAP) due to multidrug-resistant *Streptococcus pneumoniae* [strains resistant to > 2 of the following antibiotics: penicillin, second generation cephalosporins (e.g., cefuroxime), macrolides, tetracyclines, and trimethoprim/ sulfamethoxazole]
Cautions and **Contra-indications:** should be avoided in patients with a history of prolongation of the QT interval, patients with uncorrected electrolyte disorders, and patients receiving Class IA or III antiarrhythmic agents; safety and efficacy has not been evaluated in pregnant or lactating women or in individuals <18 years of age
Side-effects: *see notes above*
Interactions: *see Appendix-2*
Dose : *oral*: treatment of mild-to-moderate Cap, 320 mg once daily for 7 days
Note: For patients with creatinine clearance <40 mL/min, the dose should be adjusted to 160 mg daily. Gemifloxacin can be taken with or

without food and should be swallowed whole with a liberal amount of liquid.

Proprietary Preparations

Facticin *(Square),* Tab., 320 mg,Tk. 65/Tab.
Flogem *(Opsonin),* Tab., 320 mg, Tk. 49.06/Tab.
Gefcin *(Biopharma),*Tab.,320 mg,Tk.65/Tab.
Gelcin *(Drug Int.),* Tab., 320 mg, Tk. 65/Tab.
Gemelon *(Navana),*Tab.,320 mg, Tk.65/Tab.
Gemicin *(Healthcare),*, 320 mg, Tk. 65/Tab.
Gemif *(Beacon),* Tab., 320 mg, Tk. 65/Tab.
Gemiflox *(Popular),* Tab., 320 mg, Tk. 65.25/Tab.
Geminox *(Eskayef),* Tab,320mg, Tk.65/Tab.
Geminy *(Alco),* Tab., 320 mg, Tk. 60/Tab.
Gemiquin *(RAK),* Tab., 320 mg, Tk. 65/Tab.
Gemitab*(Ibn Sina),*Tab.,320 mg, Tk. 35/Tab.
Geoflox *(Sharif),* Tab., 320 mg, Tk. 65/Tab.
KMI *(Kemiko),* Tab., 320 mg, Tk. 65.00/Tab.
Orasquin*(Incepta),*Tab.,320 mg, Tk. 65/Tab.
Toplon *(Renata),* Tab., 320 mg, Tk. 65/Tab.
Xemi *(Orion),* Tab., 320 mg, Tk.50/Tab.

LEVOFLOXACIN

Indications: *see under dose*
Cautions: *see Notes above;* renal impairment; may impair performance of skilled tasks, history of psychiatric illness
Interactions : *see Appendix-2*
Side-effects: *see notes above;* also asthenia, rarely tremor, anxiety, tachycardia, hypotension, hypoglycemia, pneumonitis, local reactions and transient hypotension reported with infusion
Dose: *oral* acute sinusitis, 500mg daily for 10-14 days
Exacerbation of chronic bronchitis, 250-500mg daily for 7-10 days
Community-acquired pneumonia, 500mg once or twice daily for 7-14 days
Complicated UTIs, 250mg daily for 7-10 days
Skin and soft tissue infections, 250 mg daily or 500mg once or twice daily for 7-14 days
by intravenous infusion (over at least 60 minutes for 500mg), community-acquired pneumonia, 500mg once or twice daily
Complicated UTIs, 250mg daily, increased in severe infections
Skin and soft tissue infections, 500mg twice daily

Proprietary Preparations

Asilee *(Asiatic),* Tab., 500 mg, Tk. 15/Tab.
Bacnil *(Rephco),* Tab., 500 mg, Tk. 15/Tab.
Benfloxin *(Benham),* Tab., 500mg,Tk. 15/Tab.
Evo *(Beximco),* Susp., 125 mg/5 ml, Tk. 75/100 ml ; Tab. , 250 mg, Tk. 9/Tab.; Inj., (IV Infusion), 0.5%, Tk. 100/100 ml; Tab. 500 mg, Tk. 16/Tab.; 750 mg, Tk. 20/Tab.
Evocin *(Hudson),* Tab., 500mg, Tk.12.00/Tab.
Evonex *(Jayson),* Tab.,500 mg, Tk.13.05/Tab.
Exolev *(Novartis),* Tab., 500 mg, Tk.16/Tab. Infusion, 5 mg/ml, Tk. 100.38/00 ml; Inj., (IV Infusion), 5 mg/ml, Tk. 100.00/100 ml ; Susp., 125 mg/5 ml, Tk.80.00/100 ml
Leevotin *(MST),* Tab., 500 mg, Tk.15/Tab.
Leflox *(ACI),* Tab. , 500 mg , Tk. 15.06/Tab.; Tab., 750 mg, Tk. 20.07/Tab.
Leo *(Acme),* Inj.,(I.VInfusion), 0.5%,, Tk. 100.00/100 ml; Tab., 750 mg , Tk. 20.07/Tab.; 250 mg, Tk.8.04/Tab.; 500 mg, Tk. 15.05/Tab.
Leoflox *(Alco),* Tab. , 250 mg , Tk. 7.00/Tab.;500 mg, Tk. 15.00/Tab.
Lequin *(Apex),* Tab. , 500 mg, Tk. 10/Tab.
Letab *(Chemist),* Tab., 500 mg, Tk. 12.00/Tab.
Lethiquin *(Rangs),* Tab., 500mg, Tk. 15/Tab.
Levin *(Amico),* Tab. , 500 mg, Tk. 14/Tab.
Levo *(Astra),* Tab., 500 mg, Tk. 15/Tab.
Levobac *(Popular),* Susp., 125 mg/5 ml, Tk. 75.28/100 ml; Tab., 500 mg, Tk. 15.06/Tab. ; Tab., 750 mg, Tk. 20.08/Tab.
Levoflox *(Drug Int.),* Tab. , 500 mg, Tk. 15.00/Tab.; 750 mg, Tk. 20.00/Tab.
Levofloxacin *(Albion),* Tab. , 500 mg, Tk. 8.00/Tab.
Levogen *(General),* Tab. , 250 mg, Tk. 8.03/Tab.;500 mg, Tk. 15.06/Tab.; Inj.,(I.VInfusion), 0.5%,Tk. 100.00/100 ml
Levoking *(Renata),* Susp., 125 mg/5 ml, Tk. 80.00/100 ml; Tab. , 500 mg, Tk. 15.06/Tab. 750 mg, Tk. 20.07/Tab.
Levolo *(Pacific),* Tab., 500 mg, Tk. 11.28/Tab.
Levomax *(Eskayef),* Tab., 500 mg , Tk. 15.00/Tab.;750 mg, Tk. 20.00/Tab.
Levomet *(Medimet),* Tab., 250mg, Tk.8/Tab.
Levonix *(Ziska),* Tab., 500mg, Tk.14.00/Tab.
Levoquin *(Navana),* Tab., 250 mg, Tk. 8.03/Tab.;500 mg, Tk. 15.06/Tab.
Levora *(Somatec),* Tab. , 500 mg, Tk. 14.05/Tab.
Levosina *(Ibn Sina),* Tab. , 250 mg, Tk. 8.00/Tab.; 500 mg, Tk. 15.50/Tab. ; 750 mg, Tk. 21.00/Tab.
Levox *(Opsonin),* Tab., 250 mg, Tk. 6.04/Tab.; 500 mg, Tk. 11.32/Tab.; 750 mg, Tk. 15.10/Tab.;Susp.,125 mg/5 ml,Tk.75.47/100ml
Levoxin *(Incepta),*Tab., 250 mg, Tk. 8/Tab.; 500 mg, Tk. 15.00/Tab.; 750 mg, Tk. 20/Tab.
Lexa *(Globex),* Tab.,500 mg, Tk. 15.00/Tab.
Lexlo *(Ambee),* Tab., 500 mg, Tk.13.05/Tab.; 250 mg, Tk. 8.03/Tab

Lifcin *(Biopharma),* Tab., 500 mg, Tk. 15.06/Tab;. 750 mg, Tk. 20.08/Tab.; Inj.,(I.VInfusion), 0.5%, Tk. 100.00/100 ml
Lin *(Kemiko),* Tab., 250 mg, Tk. 10.00/Tab.; Tab. , 500 mg, Tk. 15.00/Tab.
Locin *(Globe),* Tab., 250 mg, Tk. 7.00/Tab.; Tab., 500 mg, Tk. 14.00/Tab.
Lotor *(Leon),* Tab., 500 mg, Tk. 15.00/Tab.
Neovox *(RAK),* Tab., 500 mg, Tk. 15.00/Tab.
Olcin *(Delta),* Tab., 500 mg, Tk. 15.00/Tab.
Orgalev *(Organic),* Tab.,500 mg, Tk. 15/Tab.
Orlev *(Orion),* Tab., 500 mg, Tk. 15.06/Tab.; Inj.,(IV Infusion), 0.5%, Tk. 100.38/100 ml
Ovel *(Aristo),* Tab., 500 mg, Tk. 15.00/Tab.
Ovoxin *(Maks),* Tab., 500 mg, Tk. 15.00/Tab.
Quiva *(Ad-din),* Tab., 500mg, Tk. 13.00/Tab.
Quixin *(Beacon),* Tab., 500 mg, Tk. 15/Tab.
Radibac *(Concord),* Tab., 500 mg, Tk. 15/Tab.
Resquin *(Healthcare),* Tab., 500 mg, Tk. 15.00/Tab.; 250 mg, Tk. 8.00/Tab.; 750 mg, Tk. 20.00/Tab.; Susp., 125 mg/5 ml, Tk. 75.28/100 ml
Toplevo *(Nipro JMI),*Tab., 500 mg , Tk. 15.00/Tab.
Trevox *(Square),* Susp.,125 mg/5 ml, Tk. 80.00/100 ml Tab. , 500 mg, Tk. 15.05/Tab.; Inj.,(IV Infusion), 0.5%, Tk. 100.00/100 ml; 750 mg, Tk. 20.07/Tab.
Trilon *(White Horse),* Tab., 500 mg, Tk. 15.00/Tab.
Urilev *(Techno),* Tab., 500 mg, Tk. 19.00/Tab.; Inj., (IV Infusion), 0.5%, Tk. 150.00/100 ml
Xelevo *(Pharmasia),*Tab., 500 mg, Tk. 15/Tab.

LOMEFLOXACIN HYDROCHLORIDE

Indications: *see under Ciprofloxacin*
Cautions: *see under Ciprofloxacin*
Contra-indications: *see under Ciprofloxacin*
Side-effects: *see notes above*
Dose: *oral*: 400 mg once/twice daily; topical for Eye infections: *see under Ciprofloxacin*

Note. evening administration may minimize the phototoxicity reactions

Proprietary Preparations
Lomeflox *(Aristo),* Tab., 400mg, Tk. 15/Tab.
Mexlo *(Square),* Tab., 400 mg, Tk. 15.05/Tab.
Omeflox*(ACI)* Tab., 400 mg, Tk. 15.06 /Tab.

MOXIFLOXACIN

Indications: sinusitis, community-acquired pneumonia, complicated skin and soft-tissue infections not responding to other antibacterials

Cautions: *see notes above;* also conditions predisposing to arrhythmias including myocardial ischemia

Contra-indications: *see notes above;* also electrolyte disturbances, heart failure with reduced left ventricular ejection fraction

Interactions: *see Appendix -2*

Side effect: *see notes above;;* also flatulence, gastritis; rarely, edema, hypertension, amnesia; very rarely, rhabdomyolysis, potentially life-threatening hepatic failure
Dose: *oral*, IV infusion, over 60 minutes, 400mg once daily

Proprietary Preparations
Flomox *(Opso Saline),* Inj.(IV Infusion), 400 mg/250 ml, Tk. 90.23/250 ml
Iventi *(Square),* Inj., (IV Infusion), 400 mg/250 ml, Tk. 175.00/250 ml
Moxibac *(Popular),* Tab., 400 mg, Tk. 70.00/Tab.; Inj.(IV Infusion) 400 mg/250 ml, Tk. 350.00/250 ml
Moxiflox *(Alco),* Tab. ,400 mg, Tk. 85.00/Tab.
Moxquin *(Incepta),* Inj. (IV Infusion), 400 mg/250 ml, Tk. 350.00/250 ml; Tab., 400 mg, Tk. 85.00/Tab.
Optimox *(Aristo),* Tab., 400 mg, Tk. 40.00/Tab.;

NALIDIXIC ACID

Indications: urinary tract infections, shigellosis
Cautions & Contra-indications: *see notes above;* also porphyria; monitoring of blood count, renal and hepatic functions required if given for more than 2 weeks, false positive urinary glucose test
Side-effects: *see notes above;* also reported weakness, increased intracranial pressure, cranial nerve palsy, toxic psychosis, metabolic acidosis
Dose: *oral*: 1 g every 6 hours for 7 days, reduced to 500 mg every 6 hours in chronic therapy; CHILD > 3 months max. 50 mg/kg daily in divided doses, reduced in prolonged therapy to 30 mg/kg daily

Proprietary Preparations
Dixicon *(Jayson),* Susp., 300 mg/5 ml, Tk. 30.45/50 ml
Nalid *(Square),* Susp., 300 mg/5 ml, Tk. 41.74/50 ml; Tab. 500 mg, Tk. 4.87/Tab.
Naligram *(Acme),* Susp., 300 mg/5 ml, Tk. 41.73/50 ml; 300 mg/5 ml, Tk. 86.10/100 ml; Tab., 500 mg, Tk.4.87/Tab.
Nalidex *(Ambee),* Susp., 300mg/5ml, Tk. 30.46/50 ml; Tab., 500 mg, Tk. 4.07/Tab.

OFLOXACIN

Indications: *see under Ciprofloxacin*
Cautions: *see under Ciprofloxacin*
Contra-indications: *see under Ciprofloxacin*
Interactions: *see Appendix -2*
Side-effects: *see notes above;;* also eye irritation; hot flushes; very rarely neuropathy, extrapyramidal symptoms, transient hypotension, change in blood sugar; myopathy, rhabdomyolysis
Dose: *oral*: for mild to moderate infections, 200-400 mg twice daily for 7-10 days, may be increased to 400-800 mg twice daily in severe cases; for uncomplicated gonorrhea, 400 mg as a single dose; for PID & chronic prostatitis therapy with ofloxacin needs to be continued for 14 & 28 days respectively; IV infusion: over at least 30 minutes 200-400 mg twice daily in mild to moderate infections, for severe or complicated infections, dose may be increased to 400 mg twice daily

Proprietary Preparations
Flocet *(Opsonin),* Tab., 200 mg, Tk. 9.06/Tab.; 400mg, Tk. 16.6/Tab.Inj.(IV Infusion) 0.2% Tk. 90.23/Vial
Oflacin *(Drug Int.),* Tab. , 200 mg, Tk. 12.00/Tab.; 400mg, Tk. 20.00/Tab.
Rutix *(Square),* Tab. , 400 mg, Tk. 22.08/Tab.; 200mg, Tk. 12.05/Tab.

PEFLOXACIN MESYLATE

Indications: *see under Ciprofloxacin*
Cautions, Contra-indications: *see under Ciprofloxacin;* also hepatic impairment
Side-effects: *see notes above;*
Dose: *oral & IV infusion* 400 mg twice daily
Interactions: *see Appendix -2*

Proprietary Preparations
Isofloxin *(Beximco),* Tab. 400 mg, Tk.16/Tab.
Nobac *(Ibn Sina),* Tab. 400 mg, Tk. 12/Tab.
Peflox *(Drug Int),* Tab. 400 mg, Tk. 11/Tab.
Peflacine*(Sanofi),* Tab. 400mg, Tk. 15.23/Tab.

SPARFLOXACIN

Indications: *see under Ciprofloxacin*; also for respiratory infections caused by S. pneumonia
Cautions, Contra-indications: *see under Ciprofloxacin;* also hepatic impairment
Interactions: s*ee Appendix-2*
Side-effects: *see notes above;*; also cardiac rhythm disturbances and prolongation of QT interval are in reports
Dose: *oral:* 200-400 mg once daily

Proprietary Preparations
Aciflox *(ACI),* Tab., 200 mg, Tk.15.06/Tab.
Asaf *(Asiatic),* Tab., 200 mg, Tk. 18.75/Tab.
Floxipar*(Acme),*Tab., 200 mg, Tk.15.56/Tab.
Omniflox *(Aristo),* Tab., 200 mg, Tk.18/Tab.
Panflox *(Amico),* Tab., 200 mg, Tk. 16/Tab.
Parflox *(Somatec),* Tab., 200 mg, Tk. 15.06/Tab.
Parlox *(Eskayef),* Tab., 200 mg, Tk. 15/Tab.
Quinoflox *(Healthcare),* Tab., 200 mg, Tk. 15.00/Tab.
Saga *(Square),* Tab., 200 mg, Tk. 15/Tab.
Salocin *(Kemiko),* Tab., 200 mg, Tk. 17/Tab.
Spacin *(Novartis),* Tab., 200 mg, Tk.26/Tab.
Spalocin *(Pacific),* Tab., 200 mg, Tk. 15.04/Tab.
Sparflox *(Alco),* Tab., 200 mg, Tk.16/Tab.
Sparfloxacin *(Albion),* Tab., 200 mg, Tk. 15.00/Tab.
Spark *(Navana),* Tab., 200 mg, Tk.15/Tab.
Sparlin *(Beximco),* Tab., 200 mg, Tk. 15.06/Tab.
Sparonex *(Drug Int.),* Tab., 200 mg, Tk.18.00/Tab.
Spar *(Globe),* Tab., 200 mg, Tk. 15.00/Tab.
Sparcin *(Chemist),* Tab., 200 mg, Tk. 12.50/Tab.
Mega-flox*(Hudson),*Tab., 200mg,Tk.15/Tab.

1.1.8 SULPHONAMIDES ANDTRIMETHOPRIM

As most of the organisms once susceptible, have been reported to be resistant and due to their potential toxicity and the fact that more effective antibiotics are available, the sulfonamides alone are no longer recommended for systemic infections. A few of them are used topically such as in eye infections and in infected wound and burn injury. In combination with trimethoprim as **co-trimoxazole**, **sulfamethoxazole,** however, is used for systemic bacterial infections. Most gram-positive and gram-negative organisms are susceptible to sulfonamides and trimethoprim but resistance rapidly develops when these drugs are used alone. Particularly relevant are *Strp. pyogenes, Strp. pneumonia, H. influenzae, Nocardia, Actinomyces, and Chlamydia trachomatis.* Methicillin-resistant strains of *S. aureus* although resistant to trimethoprim or sulfonamides alone, may be susceptible to co-trimoxazole. *P. aeruginosa, B. fragilis* and *enterococci* usually are resistant.

After oral administration of combined preparation, trimethoprim is better absorbed and more widely distributed in the body. Trimethoprim, being a weak base, concentrates in acidic prostatic and vaginal fluids. Both the sulfonamides and trimethoprim are eliminated principally through kidneys.

Cautions: All sulfonamides and their derivatives, including carbonic anhydrase inhibitors, thiazides, frusemide, bumetanide, torsemide, diazoxide, and sulfonylurea hypoglycemic drugs, are cross-allergic. Plenty of fluid is to be taken and monitoring of blood count is required in prolonged therapy. Hepatic function monitoring also is required in AIDS patients receiving co-trimoxazole. Dose adjustment is needed in renal insufficiency and therapy with sulfonamides and/or trimethoprim in pregnancy and in breast-feeding requires careful assessment of risks in the baby. Sulfonamides and cotrimoxazole are not recommended for use in infants below 6 weeks except for treatment or prophylaxis of pneumocystis pneumonia.

Side-effects: fever, skin rashes, exfoliative dermatitis, photosensitivity, urticaria, nausea, vomiting, diarrhea, crystalluria, various types of nephrosis and allergic nephritis. Stevens-Johnson syndrome and toxic epidermal necrolysis, although rare, is a particularly serious and potentially fatal type of reaction associated with use of sulfonamides. Hemolytic anemia, particularly in glucose-6-phosphate-dehydrogenase deficient patients, aplastic anemia, granulocytopenia, thrombocytopenia, or leukemoid reactions also are reported after sulfonamides therapy; risk of kernicterus in newborns if taken near the end of pregnancy.

Trimethoprim may produce megalo-blastic anemia, leucopenia and granulocytopenia. Nausea and vomiting, drug fever, vasculitis, renal damage and central nervous system disturbances occasionally occur.

CO-TRIMOXAZOLE[ED]

Indications: urinary tract infections, acute exacerbation of chronic bronchitis, typhoid fever, shigellosis, pneumocystis carinii pneumonia, acute otitis media in children, toxoplasmosis, nocardiasis C**autions:** monitoring of blood counts is required in prolonged therapy; adequate fluid intake is to be maintained; also *see Notes above*

Contra-indication: porphyria

Interactions: *see Appendix-2*

Side-effects: *see notes above;*

Dose *oral*: ADULT 480-960 mg every 12 hours; CHILD 6 weeks-5 months 120 mg every 12 hours; 6 months-5 years 240 mg every 12 hours; 6-12 years, 480 mg every 12 hours; *By IV infusion:* ADULT 960 mg every 12 hours increased to 1.44 g every 12 hours in severe infections; CHILD 36 mg/kg

daily in 2 divided doses increased to 54 mg/kg daily in severe infections; pneumocystis carinii infections: for treatment oral or IV infusion, ADULT & CHILD over 4 weeks 120 mg/kg daily in 2-4 divided doses for 14 days, for prophylaxis: oral: ADULT 960 mg once daily or 960 mg on alternate days or 960 mg twice daily on alternate days; CHILD 6 weeks-5 months 120 mg twice daily on 3 consecutive days or 7 days/week; 6 months-5 years 240 mg 6-12 years 480 mg

Proprietary Preparations

Albutrim *(Albion),* Susp., 200 mg+40 mg/5 ml, Tk. 20/60 ml; DS Tab. , 800 mg + 160 mg, Tk. 2/Tab.
Alcot *(Pacific),* DS Tab. , 800 mg + 160 mg , Tk. 1.50/Tab.; Susp., 200 mg + 40 mg/5 ml , Tk. 15.04/60 ml ; Tab., 400 mg + 80 mg, Tk. 0.75/Tab.
Apcetrim *(APC),* Susp.,200 mg + 40 mg/5 ml, Tk. 20.00/60 ml
Ativet *(Acme),* Susp.200 mg+40 mg/5 ml, Tk.102/60 ml
Avlotrin *(ACI),* Susp.., 200 mg + 40 mg/5 ml , Tk. 22.14/60 ml;DS Tab. , 800 mg + 160 mg , Tk. 2.01/Tab.
Bactipront *(Renata,),* Susp.., 200 mg + 40 mg/5ml , Tk. 22.06/60 ml
Bicot *(Bios),* DS Tab., 800mg+160 mg, Tk. 2.00/Tab., DS Tab , 800 mg + 160 mg, Tk. 2.00/Tab.; Susp., 200 mg+40 mg/5 ml, Tk. 21.25/60 ml ;Susp., 200 mg+40 mg/5 ml, Tk. 21.25/60 ml
Biotrim *(Biopharma),* DS Tab. , 800 mg + 160 mg , Tk. 2.01/Tab.; Susp., 200 mg + 40 mg/5 ml, Tk. 21.56/60 ml; Tab., 400 mg + 80 mg, Tk. 1.49/Tab.
Centrim *(Central),* Susp., 200 mg + 40 mg/5ml, Tk. 20.00/60 ml;DS Tab. , 800 mg + 160 mg, Tk. 2.00/Tab.
Chemotrim *(Opsonin),* Susp.., 200 mg + 40 mg/5 ml , Tk. 16.65/60 ml
Cosat *(Eskayef),* Susp., 200 mg+40 mg/5 ml, Tk. 22.00/60 ml; DS Tab, 800 mg + 160 mg, Tk. 2.02/Tab.
Cotrim*(Square),* Susp., 200 mg+40 mg/5 ml, Tk. 21.58/60 ml ; 400 mg + 80 mg, Tk. 1.49/Tab. ;DS Tab , 800 mg + 160 mg, Tk. 2.03/Tab.
Co-trimoxazole *(Popular),* Tab., 400 mg + 80 mg, Tk. 1.48/Tab. Susp., 200 mg+40 mg/5 ml, Tk. 22.00/60 ml
G-Cotrimoxazole *(Gonoshasthaya),* Susp, 200 mg+40 mg/5 ml, Tk. 28.00/100 ml; Tk.19.60/50ml; Tab., 400 mg + 80 mg, Tk. 1.20/Tab.
Gentrim *(General),* Susp, 200 mg+40 mg/5 ml, Tk. 22.13/60 ml; Tab., 400 mg + 80 mg , Tk. 1.49/Tab.
Jasotrim *(Jayson),* Susp., 200 mg + 40 mg/5 ml , Tk. 21.61/60 ml; Tab., 400 mg + 80 mg, Tk. 1.49/Tab.
Maktrim *(Maks),* Susp.,200 mg+40 mg/5 ml, Tk. 22.45/60 ml ;DS Tab., 800 mg+160 mg, Tk. 2.60/Tab.
Megaset *(Alco),* Tab., 800 mg+160 mg, Tk. 2.02/60 ml
Megatrim*(Beximco),* Susp.., 200 mg + 40 mg/5 ml , Tk. 22.10/60 ml ;DS Tab., 800 mg + 160 mg, Tk. 2.60/Tab.
Navatrim *(Navana),* Susp., 200 mg + 40 mg/5 ml , Tk. 21.07/60 ml
Neoset *(Alco),* Tab., 400 mg + 80 mg, Tk. 1.42/Tab.
Octrim *(Orion),* Susp., 200 mg + 40 mg/5 ml , Tk. 21.08/60 ml
Politrim *(Acme),* Tab., 400 mg + 80 mg, Tk. 1.42/Tab.; DS Tab, 800 mg + 160 mg , Tk. 2.64/Tab.; Susp, 200 mg+40 mg/5 ml, Tk. 21.58/60 ml
Regtin *(Rephco),* Tab. , 400 mg + 80 mg, Tk. 1.25/Tab.
Septra *(Asiatic),* Susp, 200 mg+40 mg/5 ml, Tk. 21.57/60 ml ; 400 mg + 80 mg, Tk. 1.49/Tab.; DS Tab , 800 mg + 160 mg, Tk. 2.03/Tab.
Sinatrim *(Ibn Sina),* Susp., 200 mg + 40 mg/5 ml , Tk. 22.00/60 ml; DS Tab., 800 mg + 160 mg , Tk. 2.10/Tab.
Sulphatrim *(Amico),* Tab., 800 mg + 160 mg, Tk. 2.50/Tab.; Susp., 200 mg+40 mg/5 ml, Tk. 22.10/60 ml; 400 mg + 80 mg, Tk. 1.49/Tab.
Triprim *(Supreme),* Susp., 200 mg+40 mg/5 ml, Tk. 21.00/60 ml; Tab., 400 mg + 80 mg, Tk. 1.48/Tab.;DS Tab., 800 mg+160 mg,Tk.2/Tab.
Co-try *(Ad-din),* Suspn., 240mg/5ml, Tk. 21.5/60 ml; DS Tab., 960mg, Tk. 2.00/Tab.
Meditrim *(Medimet),* Susp., 20mg+40mg/5ml, Tk.20.00/60ml; Tab., 480mg, Tk.1.48/Tab.; 120mg, Tk.1.30/Tab.; 960mg, Tk.2.60/Tab.
Seftrim *(Hudson),* Susp., 20mg+40mg/5ml , Tk.20.00/60 ml; DS Tab., 960mg, Tk.2.00/Tab.
Soma-DS *(Ambee),*Tab., 960 mg, Tk. 2.03/Tab.
Sumetrolim *(Ambee),* Susp. 240mg/5ml,Tk. 21.61/ 60 ml

1.1.9 METRONIDAZOLE, TINIDAZOLE AND ORDINAZOLE

see section 1.3.2. Antiamebic Drugs

1.1.10ANTI-MYCOBACTERIAL DRUGS

1.1.10.1ANTI-TUBERCULOSIS DRUGS

FIRST LINE DRUGS

ETHAMBUTOL HYDROCHLORIDE [ED]

Ethambutol is effective against most strains of M tuberculosis and M kansasii and good number of strains of M. avium complex. No other bacteria are sensitive to ethambutol. Cleared by both renal and nonrenal routes, renal being more prominent.
Indications: tuberculosis in combination with other drug (see under chemotherapy for tuberculosis)
Cautions: dose reduction required in renal impairment, also monitoring of plasma concentration if creatinine clearance less than 30 ml/min; tests of visual acquity and red-green discrimination prior to therapy and routine ophthalmological monitoring during therapy recommended, patients should be warned to report any visual change; cautions for elderly, young children and pregnant patients
Contra-indications: optic neuritis, poor vision
Interactions: *see Appendix-2*
Side-effects: optic neuritis leading to loss of red/green discrimination ability, pruritus, joint pain, GIT upset, abdominal pain, malaise, headache, dizziness, mental confusion, disorientation, hallucination; numbness and tingling of fingers due to peripheral neuritis infrequently; rarely anaphylaxis, thrombocytopenia and leucopenia
Dose: *oral*: ADULT & CHILD > 12 years 15 mg/kg once daily; for recurrent cases, 25 mg/kg/d for 60 days then 15 mg/kg/d; CHILD 6-12 years, 10-15 mg/kg/d; for intermittent supervised therapy, ADULT & CHILD > 12 years, 30 mg/kg thrice weekly or 50 mg/kg twice weekly (not recommended for children under 5 years)

Proprietary Preparations
(For Combined Preparations of Ethambutol, see under Isoniazid)

ISONIAZID[ED]

Isoniazid is effective selectively against M. tuberculosis and M. kansasii. Hepatic clearance by genetically determined acetylation is the principal mode of isoniazid elimination.
Indications: tuberculosis in combination with other drug (see under chemotherapy for tuberculosis)
Cautions: monthly evaluation of patients for symptoms of hepatitis has been advised, one-third to one-half of normal dose is recommended in moderate to severe hepatic insufficiency; other conditions that require cautious therapy with isoniazid are epilepsy, history of psychosis, alcohol dependence, malnutrition, diabetes mellitus, slow acetylator status, porphyria, pregnancy, breast-feeding and HIV infection
Contra-indications: drug induced liver disease
Interactions: *see Appendix-2*

Side-effects: rash, fever, jaundice, peripheral neuritis leading to numbness, tingling of the feet particularly in slow acetylators, diabetic, HIV infected and malnourished or anemic patients; allergic reactions including hepatitis, skin eruptions and morbilliform eruptions, maculopapular, purpuric and urticarial rashes; hematological reactions like agranulocytosis, eosinophilia, thrombocytopenia, hemolytic anemia; convulsions, insomnia, muscle twitching, ataxia, paraesthesia, stupor, toxic encephalopathy; optic neuritis and atrophy

Dose: *oral or IM inj:* treatment and prophylaxis, ADULT 300 mg once daily; CHILD 10-20 mg/kg (max. 300 mg) once daily; for intermittent supervised therapy, 10 mg/kg thrice or 15 mg twice weekly; pyridoxine, 15-50 mg/d particularly in high risk patients for peripheral neuropathy

Proprietary Preparations
Rifampicin + Isoniazid
Rimactazid *(Novartis),* Tab. , 300 mg + 150 mg, Tk. 8.37/Tab. ;150 mg+ 75 mg, Tk. 4.00/Tab.;, 450 mg + 300 mg, Tk. 11.71/Tab.

Isoniazid + Thiacetazone
Rifampicin+Isoniazid+Pyrazinamide

Rifampicin + Isoniazid + Pyrazinamide + Ethambutol HCl
Rimstar 4-FDC *(Novartis),* Tab. , 150 mg +75 mg + 400 mg + 275 mg, Tk. 10.00/Tab.

RIFAMPICIN[ED]

Rifampicin exerts broad-spectrum antibacterial effect and is effective against most gram-positive as well as many gram-negative organisms. S. aureus, coagulase-negative *staphylococci, E. coli, Pseudomonus, indole-positive and indole-negative Proteus, and Klebsiella, N. meningitidis, H. influenzae* are particularly susceptible. Of the mycobacteria, *M. tuberculosis, M. kansasii, M. scrofulaceum, M. intracellulare* are sensitive, while *M. fortuitum* is highly resistant.
After absorption from gastrointestinal tract, it is eliminated rapidly in the bile and exhibits an entrohepatic recycling. **Rifampicin** is a potent inducer of hepatic drug metabolizing enzymes and eliminates principally in feces.

Indications: treatment of tuberculosis in combination with other drug *(see under chemotherapy for tuberculosis),* an alternative to isoniazid as prophylactic in close contacts to a case of isoniazid-resistant tuberculosis provided that the index case is susceptible to this drug; Leprosy, brucellosis, hemophilus influenzae infection, legionnaires disease, prophylaxis of meningococcal meningitis; in combination with ceftriaxone or vancomycin for treatment of meningitis caused by penicillin-resistant strains of pneumococci, in combined therapy against serious staphylococcal infections such as osteomyelitis and prosthetic valve endocarditis

Cautions: patients with hepatic impairment need hepatic function and blood counts monitoring, alcoholism, during concomitant use of oral contraceptives, patients should be advised to use additional means of contraception, pregnancy, breast-feeding, porphyria; patients should be warned about harmless orange-red color to urine, feces, saliva, sputum, tears, and sweat

Contra-indications: jaundice, liver damage

Interactions: *see Appendix-2*
Side-effects: gastrointestinal symptoms including anorexia, nausea, vomiting, diarrhea; cholestatic jaundice and occasionally hepatitis; light-chain proteinuria commonly and acute renal failure rarely, thrombocytopenic purpura, urticaria, rashes; a flu-like syndrome characterized by fever, chills, myalgias, anemia, and sometimes associated with acute tubular necrosis
Dose: tuberculosis treatment and prophylaxis, ADULT < 50 kg, 450 mg once daily, 50 kg and over 600mg once daily or as 10 mg/kg/d; CHILD 10 mg/kg (max. 600 mg) daily; for intermittent supervised therapy, 600 mg twice or thrice weekly;
Leprosy, supervised therapy of 600 mg once in a month, 450 mg for patients weighing less than 35 kg; Brucellosis, legionnaires disease and serious staphylococcal infections, in combination with other drugs, orally or by IV infusion, 0.6-1.2g daily in 2-4 divided dose

Proprietary Preparations
(For Combined Preparations of Rifampicin, see under Isoniazid)

PYRAZINAMIDE[ED]

This is an important front-line anti-tuberculosis drug and is used in combination with isoniazid and rifampicin in short-course, 6 months regimen as a 'sterilizing' agent active against residual intracellular organisms responsible for relapse. Pyrazinamide produces selective bactericidal effect against *M. tuberculosis,* but not effective against *M. bovis*.
The drug is taken up by macrophages and is converted to active pyrazinoic acid by mycobacterial pyrazinamidase. The drug eliminates principally by renal route.

Indications: treatment of tuberculosis in combination with other drugs (see under chemotherapy for tuberculosis); in combination with ciprofloxacin or ofloxacin as prophylactic in close contacts to a case of multidrug-resistant tuberculosis provided that the index case is susceptible to these drugs

Cautions: hepatic insufficiency, monitoring of liver function is advised; therapy should be stopped if there is evidence of hepatotoxicity (elevation of plasma alanine and aspartate aminotransferases are the earliest features of drug hepatotoxicity); diabetes, gout

Contra-indications: liver damage, porphyria
Interactions: *see Appendix-2*
Side-effects: most serious is the hepatotoxicity; liver tenderness, hepatomegaly, jaundice and fulminating liver failure that can be fatal; hyperuricemia and gouty arthritis occur uniformly and not considered to be a reason to halt therapy; also anorexia, nausea and vomiting, dysuria, occasional mild fever, malaise
Dose: *oral*: treatment and prophylaxis, ADULT & CHILD 15-30 mg/kg daily as a single dose, max. 2 g/d; for intermittent supervised therapy, 35-40 mg/kg twice or thrice weekly, max. 3 g/occasion

Proprietary Preparations
(*For Combined Preparations of Pyrazinamide, see under Isoniazid)*

STREPTOMYCIN[ED]

see section 1.1.4

THIACETAZONE

Thiacetazone is bacteriostatic against many strains of M tuberculosis and M leprae. Thiacetazone containing regimens are less effective than the short-course regimens recommended by WHO, but are used with isoniazid in long-term regimens principally because of its low cost. WHO does not recommend its use in leprosy.

Dose: *See standard treatment Guidelines(Appendix-1)*

Generic Preparation
Isoniazid 300 mg + Thiacetazone 150 mg Tablet

SECOND LINE ANTI-TUBERCULOSIS DRUGS:

AMIKACIN

see under Aminoglycosides

CAPREOMYCIN

Indications: in combination with other drugs for tuberculosis resistant to first-line drugs
Cautions: renal, hepatic, or auditory impairment, monitoring of renal, hepatic, auditory, vestibular function and electrolytes are advised; pregnancy (teratogenic in animals) and breast-feeding
Interactions: *see Appendix-2*
Side-effects: hearing loss, tinnitus, transient proteinuria, cylindruria, electrolyte disturbances and nitrogen retention, severe renal failure rarely hypersensitivity reactions including urticaria and rashes; leukocytosis or leucopenia rarely thrombocytopenia; change in liver function tests, neuromuscular block after large doses, pain and induration at injection site
Dose: *deep IM inj*. 15-30 mg/kg/d or up to 1 g daily for 2-4 months then 1 g, 2-3 times weekly

Generic Preparation
Capsule, 250mg

CYCLOSERINE

This drug is inhibitory to many gram-positive and gram-negative organisms but is used exclusively to treat tuberculosis caused by strains of M. tuberculosis resistant to first-line drugs. The drug has adequate oral bioavailability and achieves antibacterial concentrations in many tissues including

central nervous system and CSF. Most of the drug is cleared renally in unchanged form.
Indications : in combination with other, drugs, tuberculosis resistant to first-line
Cautions: dose reduction is necessary in renal impairment; monitoring of blood counts, renal and hepatic function; pregnancy and breast-feeding; neurological toxicities are common above the dose of 0.75 g/d
Contra-indications: severe renal impairment, epilepsy, depression, porphyria
Interactions: *see Appendix-2*
Side-effects: most serious toxicities are peripheral neuropathy and central nervous system dysfunction including headache, dizziness, vertigo, drowsiness, tremor, convulsions, confusion, depression, and psychotic reactions, (dose reduction & pyridoxine 150 mg/d are recommended); rashes, allergic dermatitis megaloblastic anemia; changes in liver function tests; heart failure at high doses reported
Dose: ORAL: initially 250 mg every 12 hours for 2 weeks, then increased to maximum 500 mg every 12 hours; CHILD initially 10 mg/kg daily adjusted according to blood concentration and response

Generic Preparation
Capsule, 250 mg

ETHIONAMIDE

Ethionamide has selective antimycobacterial activity including M tuberculosis, M kansasii, M leprae and some strains of M avium complex.

Indications: in combination with other drugs for tuberculosis resistant to first-line drugs or when first line drugs cannot be given because of toxicity; alternative to Clofazimine in regimens for leprosy
Cautions: hepatic impairment (should not be used in severe impairment), monitoring of hepatic function before and during treatment; unsafe in porphyria; psychiatric disorders; monitoring of blood glucose, thyroid function and of visual acquity
Interactions: *see Appendix-2*
Side-effects: GI disturbances, mental disturbances including anxiety, depression, psychotic disorders; headache, dizziness, postural hypotension; hepatotoxicity; hypersensitivity reactions including thrombocytopenia, purpura, alopecia, dermatitis
Dose: *oral*: *resistant tuberculosis*: ADULT, 15-20 mg/kg daily (max. 1 g daily); CHILD, 10-20 mg/kg (max. 750 mg) daily; in single or divided doses

Generic Preparation
Tablet, 250mg

PARA-AMINOSALICYLIC ACID

This is bacteriostatic against M tuberculosis, while other mycobacteria are usually resistant.

Indications: in combination with other drugs for tuberculosis resistant to first-line drugs or when first line drugs cannot be given; ulcerative colitis

Cautions: renal and hepatic impairment (should not be used in severe impairment); gastric ulcer; G6PD deficiency; pregnancy, breast-feeding

Interactions: *see Appendix-2*
Side-effects: GI disturbances including nausea, vomiting, abdominal pain, gastric irritation and ulcer; hypersensitivity reactions including skin rashes, arthalgia, lymphadenopathy, syndrome like infectious mononucleosis; hemolytic anemia
Dose: *oral: tuberculosis*: ADULT, 12 g daily in 3 divided doses; *ulcerative colitis:* 2 g once daily

RIFABUTIN

It exerts antibacterial activity similar to that of rifampicin. Rifabutin has better activity against mycobacterium avium complex organisms than does rifampicin. It is both a substrate and inducer of cytochrome P 450 enzymes.
Indications: *see under Dose*
Cautions: *see under rifampicin*

Contra-indications: jaundice, liver damage (not recommended for use in children)
Interactions: *see Appendix -2*
Side-effects: nausea, vomiting; leucopenia, thrombocytopenia, anemia, rarely hemolysis; raised liver enzymes, jaundice, rarely hepatitis; uveitis following high doses or administration with drugs which raise plasma concentration; arthralgia, myalgia, influenza-like syndrome, dyspnea; also hypersensitivity reactions including fever, rash, eosinophilia, bronchospasm, shock; urine, saliva and other body secretions colored orange-red; asymptomatic corneal opacities with long term use
Dose: ORAL: prophylaxis of mycobacterium avium complex infections in HIV-infected patients, 300 mg daily as a single dose; treatment of non-tuberculous mycobacterial disease, in combination with clarithromycin and ethambutol, 450-600 mg daily as a single dose;
alternative to rifampicin for treatment of tuberculosis in HIV-infected patients (as it as less interactions than rifampicin with indinavir and nelfinavir), 150-450 mg daily as a single dose for at least 6 months; for preventive therapy of tuberculosis, either alone, in a 6-month regimen or with pyrazinamide in a 2-month regimen, 150-450 mg daily as a single dose; treatment of pulmonary tuberculosis, 150-450 mg daily as a single dose for 6 months

Generic Preparation
Capsule, 150 mg

CHEMOTHERAPY OF TUBERCULOSIS

Mycobacteria are slowly growing organisms, can remain dormant for long time and a substantial proportion reside within macrophages inaccessible to many drugs and can rapidly develop resistance to any single drug. As such, combinations of drugs are employed to overcome these obstacles and to prevent emergence of resistance. Another problem, to prevent disease relapse, required therapy is of long duration which most patients fail to comply. To overcome this problem, supervised short-course therapy with intermittent administration of drugs has been formulated and adopted by many national anti-tuberculosis programmes. Followings are recommended regimens for treatment and prophylaxis of tuberculosis:

1.1.10.2 DRUGS FOR LEPROSY

(see Appendix-1)

Leprosy is a slowly progressive chronic infectious granulomatous disease caused by *Mycobacterium leprae* affecting mostly the skin and peripheral nerves resulting in anaesthetic hypopigmented patches in skin, and sometimes trophic changes producing deformities in certain other tissues notably oral/nasal mucosa, the eye, muscle and bone. Multidrug treatment (MDT) for leprosy as recommended by the Bangladesh National TB and Leprosy Control Programme is shown in *Appendix*

CLOFAZIMINE[ED]

Clofazimine is active against both dapsone-sensitive and dapsone-resistant bacilli and against *M. intracellulare.*
Variable absorption from gut and a major portion of drug is excreted in feces. Clofazimine is stored widely in reticuloendothelial tissues and skin.
Indications: leprosy in combination with other drug, chronic skin ulcers (Buruli ulcer) produced by M. ulcerans, prophylaxis against erythema nodosum leprosum

Cautions: hepatic and renal impairment; pregnancy and breast-feeding; may discolor soft lenses; best to avoid if persistent abdominal pain and diarrhea

Interactions: *see Appendix-2*

Side-effects: nausea, vomiting (hospitalize if persistent), abdominal pain; headache; tiredness; brownish-black discoloration of lesions and skin including areas exposed to light, reversible hair discoloration; dry skin; red discoloration of feces, urine and other body fluids; also rash; pruritus, acne-like eruptions, anorexia, eosinophilic enteritis, bowel obstruction, dry eyes, dimmed vision, macular and subepithelial corneal pigmentation; elevated blood sugar, weight loss, spinal infarction, lymphadenopathy
Dose: *oral*: leprosy, 50-100 mg daily, in lepromatous lepra reactions, dose increased to 300 mg daily for maximum of 3 months

Generic Preparation
Capsule, 50 mg

DAPSONE[ED]

Like sulfonamides, it acts by inhibiting microbial folate synthesis; well absorbed after oral administration and widely distributed throughout body fluids and tissues and tends to accumulate in skin, muscle, liver, and kidney. Dapsone is principally cleared through kidney after acetylation.
Indications: leprosy, treatment and prophylaxis of pneumocystis carinii pneumonia, dermatitis herpetiformis
Cautions: dose adjustment required in renal failure, cardiac or pulmonary disease; anemia; hemolysis in G-6PD deficient patients, during long-term treatment, patients and their attendants should be told how to recognize signs of blood disorders; they should be advised to get admission into hospitals if symptoms such as fever, sore throat, rash, mouth ulcers, purpura, bruising or bleeding develop; breast-feeding, pregnancy; best to avoid in porphyria;

Contraindications: blood dyscrasia, hypersensitivity to dapsone

Interactions: *see Appendix-2*
Side-effects: dose-related and not common at dose used for leprosy, hemolysis in G-6PD deficient patients, methemoglobinemias rather common; neuropathy, allergic dermatitis anorexia, nausea, vomiting, pruritus, tachycardia, headache, insomnia, psychosis during therapy of lepromatous leprosy; erythema nodosum leprosum often develops
Dose: *oral*: leprosy, 100 mg daily or 1-2 mg/kg daily,

Generic Preparation
Tablet, 100mg

RIFAMPICIN[ED]

see under Drugs for tuberculosis

1.1.11 DRUGS USED IN SEXUALLY TRANSMITTED DISEASES

Sexually transmitted diseases (STDs) are a group of communicable diseases that are transmitted predominantly by sexual contact and caused by a wide range of bacterial, viral, protozoal and fungal agents, and also by different ectoparasites.

The highest incidence of STDs is observed in 20–24 years age group. Certain socio-demographic factors such as population explosion, rapid urbanization and industrialization, rural to urban migration, prostitution, broken homes, sexual disharmony, social disruption and alcoholism undoubtedly contribute towards the increase of STDs in a developing country like Bangladesh. Over 20 pathogens have been found to spread commonly by sexual contact. The most common of these pathogens with usual clinical manifestations are *Treponema pallidum, Neisseria gonorrhoea, Haemophilus ducreyi* and *Chlamydia trachomatis;* though AIDS caused by the human immunodeficiency virus (HIV) is not yet a very common STD in Bangladesh, there are special reasons for awareness against this new global menace. Syphilis and gonorrhoea being the two most prevalent STDs, the drug treatments regimens for these two diseases are described.

1.1.12 OTHER ANTIBACTERIALS

CHLORAMPHENICOL[ED]

(see section 10.2 & 11.1.1)

Chloramphenicol was found to have a serious (often fatal) bone marrow depression caused by hypersensitivity, and also in a dose dependent manner. Potentially fatal 'grey syndrome' was also reported in neonates. In course of time, these restricted the use of chloramphenicol. However, it is still the drug of choice for enteric fever when other antibiotics are resistant. For *H. influenzae* infections, especially meningitis, emergence of ampicillin resistant strains led to a reappraisal of the use of chloramphenicol.

Indications: severe rickettsial infections such as typhus or rocky mountain fever in children, alternative to a beta-lactam for bacterial meningitis due to penicillin-resistant strain of pneumo- or meningo-coccus and in penicillin-allergic patients, alternative to tetracyclines for acute and chronic brucellosis, eye and ear infections caused by susceptible organisms
Cautions: dose must be reduced in hepatic impairment, in newborns less than a week old and in premature infants; repeated courses & prolonged treatment are not recommended; periodic blood counts and monitoring of plasma concentration (in neonates) are required
Contra-indications: pregnancy, breast-feeding, porphyria
Interactions: *see Appendix-2*
Side-effects: blood dyscrasia such as leucopenia, thrombocytopenia, dose-related reversible suppression of red-cell production, idiosyncratic irreversible aplastic anemia; also peripheral neuritis, optic neuritis; erythema multiforme; nausea, vomiting, diarrhea, grey baby syndrome (abdominal distension, pallid cyanosis, circulatory collapse) usually after excessive doses in neonates with immature hepatic function
Dose: *oral, IV inj. or infusion:* ADULT & CHILD, 50-100 mg/kg/d in 4 divided doses; INFANTS < 2 weeks, 25 mg/kg/d in 4 divided doses; topical (as 0.5% solution and 1% ointment); 2-3 drops/in thin layer 2-3 times or more

Proprietary Preparation
Chloramphenicol *(Hudson),* Cap., 250mg, Tk.2.50/Cap.

See also section 10.2 & 11.1.1

CLINDAMYCIN

Indications: severe anaerobic infection caused by bacteroids and other anaerobes, septic abortion, pelvic abscesses, with an aminoglycosides or cephalosporin to treat penetrating wound of gut, with primaquine as an alternative to co-trimoxazole in pneumocystis pneumonia in AIDS patients and with pyrimethamine in AIDS-related toxoplasma encephalitis; topically in acne.
Cautions: should be discontinued if there is diarrhea or colitis, requires monitoring of renal and hepatic functions in prolonged therapy and in neonates and infants; renal or hepatic impairment, pregnancy and breast-feeding
Contra-indications: diarrheal states
Interactions: *see Appendix-2*
Side-effects: diarrhea, nausea, vomiting, pseudomembranous colitis, impaired liver function, jaundice, neutropenia, eosinophilia, agranulocytosis, thrombocytopenia, rash, urticaria, erythema multiforme, exfoliative and vesiculobullous dermatitis
Dose: *oral*: 150-300 mg every 6 hours; up to 500 mg every 6 hours in severe infections; CHILD 10-20 mg/kg/d in 4 divided doses; deep IM inj. or IV infusion: 0.6-2.7 g daily in 2-4 divided doses; life-threatening infection, up to 4.8 g daily; CHILD > 1 month, 15-40 mg/kg daily in 3-4 divided doses; severe infections, at least 300 mg daily regardless of weight

Proprietary Preparations

Anobac *(Globe),* Cap. 300 mg, Tk. 15/Cap.; 150 mg, Tk. 8/Cap.
Cinamycin *(Ibn Sina),* Cap.,150 mg, Tk. 8.00/Cap.; 300 mg, Tk. 15.00/Cap.
Cleodin *(General),* Cap.,150 mg, Tk. 8.00/Cap.; 300mg, Tk. 15.00/Cap.;Inj., 300 mg/2 ml, Tk. 40.00/2ml;., 600 mg/4 ml, Tk. 70.00/4 ml
Climed *(Leon),* Cap.,150 mg, Tk. 8.00/Cap.; Cap., 300mg, Tk. 15.00/Cap.
Climycin *(Square),* Cap.,150 mg, Tk. 8.04/Cap.; 300mg, Tk. 15.05/Cap.
Clinacyn *(Beximco,),* Cap. , 150 mg, Tk. 8.00/Cap.; 300 mg, Tk. 15.00/Cap.
Clincin *(Navana),* Cap., 150 mg, Tk. 8.00/Cap.; 300mg, Tk. 15.00/Cap.;Syrup, 75 mg/5 ml, Tk. 250/100 ml
Clindabac *(Popular),* Cap., 150 mg, Tk. 8.00/Cap. ; Cap., 300 mg, Tk. 15.00/Cap.; Inj., 300 mg/2 ml, Tk. 40.00/2ml ;600 mg/4 ml, Tk. 70.00/4 ml
Clindacap *(Astra),* Cap.,300 mg, Tk. 15.00/Cap.
Clindacin *(Incepta),* Cap., 150 mg, Tk. 8.00/Cap.; 300mg, Tk.15.00/Cap.;Inj., 300 mg/2 ml, Tk. 40.00/2ml; 600 mg/4 ml, Tk. 70.00/40 ml; Syrup, 75 mg/5 ml, Tk. 280.00/100 ml
Clindamet *(Somatec),* Cap.,150 mg, Tk. 8.00/Cap.; 300 mg, Tk. 15.00/Cap.
Clindaver *(Veritas),* Cap., 300 mg, Tk. 15.00/Cap.
Clindax *(Opsonin),* Cap., 150 mg, Tk. 6.04/Cap.; 300mg, Tk. 11.32/C;Inj., 300 mg/2 ml, Tk. 30.19/2 ml; 600 mg/4 ml, Tk. 52.83/4 ml;Susp., 75 mg/5 ml, Tk. 188.68/100 ml
Clinex *(Aristo),* Cap., 300 mg, Tk. 15.00/Cap; 150 mg, Tk. 8.00/Cap.
Daclin *(ACI),* Cap., 150 mg, Tk. 8.00/Cap.; 300 mg, Tk. 15.00/Cap.
Dalacin *(Drug int.),* Cap., 300 mg, Tk. 15.00/Cap. Inj., 300 mg/2 ml, Tk. 40.00/2 ml 600 mg/4 ml, Tk. 70/4 ml
Linacin *(Sharif),* Cap. , 150 mg, Tk. 8.00/Cap.; Cap. , 300 mg, Tk. 15.00/Cap.
Lincocin *(Acme),* Cap., 150 mg, Tk. 8.00/Cap.; 300 mg, Tk.15.00/Cap.
Lindamax *(Eskayef),* Cap, 150 mg, Tk. 8.00/Cap.; 300 mg, Tk. 15.00/Cap.
Qcin *(Renata),* Inj., 300 mg/2 ml, Tk. 40.00/2 ml; 600 mg/4 ml, Tk. 70.00/4 ml; , Cap. , 150 mg, Tk. 8.00/Cap.**;** 300 mg, Tk. 15.00/Cap.
Xindal *(Orion),* Cap., 150 mg, Tk. 8.00/Cap.; 300 mg, Tk. 15.00/Cap.

LINEZOLID

Indications: pneumonia, complicated skin and soft tissue infections caused by Gram- positive bacteria including those due to vancomycin-resistant enterococci and methicillin resistant S aureus

Cautions: blood count including platelet count requires weekly monitoring; if significant myelosuppression, treatment should be stopped; visual function monitoring is required in long therapy(more than 28 days), patients should be warned to report symptoms of visual impairment immediately; history of seizures, hepatic impairment, renal impairment, pregnancy; tyramine–rich foods

Interactions: *see Appendix -2*

Contra-indications: breast-feeding; patients using MAO-inhibitor drugs

Side-effects: diarrhea, nausea, and vomiting, metallic taste, dizziness and abnormal liver function test; reversible myelosuppression including anemia; leucopenia, pancytopenia, and in particular, thrombocytopenia has been reported

Dose: *oral* or *IV infusion* over 30-120 minutes: ADULT over 18 years 600mg every 12 hours for 10-14 days

Proprietary Preparations

Arlin *(Beximco),* Tab., 600 mg, Tk. 85/Tab.; Susp., 100 mg/5 ml, Tk. 280/100 ml; IV Infusion, 2 mg/ml, Tk. 450/300 ml
Linexil *(Opsonin),* Tab., 600 mg, Tk. 63.91/Tab.; Susp., 100 mg/5 ml, Tk. 210.53/100 ml; IV Infusion, 2 mg/ml, Tk. 338.35/300 ml
Linzolid *(Incepta),* Tab., 600 mg, Tk. 85/ Tab.; Susp., 100 mg/5 ml, Tk. 280/100 ml; IV Infusion, 0.6 gm/300 ml, Tk. 450/300 ml

NITROFURANTOIN[ED]

Indications: prophylaxis, long-term suppression and treatment of uncomplicated lower urinary tract infections

Cautions: hepatic insufficiency; elderly patients (risk of acute pulmonary reactions); anemia; diabetes mellitus; electrolyte imbalance; vitamin B and folate deficiency; pulmonary disease; on long-term therapy, monitor liver function and monitor for pulmonary symptoms (discontinue if deterioration in lung

function false positive urinary glucose; urine may be colored yellow or brown;
Contra-indications: known hypersensitivity; renal impairment; pregnancy (at term) and breast-feeding; infants less than 3 months old, G6PD deficiency; acute porphyria

Interactions: *see Appendix* -2

Side-effects: diarrhea, nausea, and vomiting; neurological disturbances including dizziness, headache, vertigo, nystagmus, benign intracranial hypertension, severe and sometimes irreversible peripheral polyneuropathy; hypersensitivity reactions including skin rashes, urticaria, pruritus, fever, erythema multiforme, Steven-Johnson syndrome, exfoliative dermatitis, pancreatitis, blood disorders (including agranulocytosis, thrombocytopenia, and aplastic anemia); acute pulmonary sensitivity reactions characterized by sudden onset of fever, chills, eosinophilia, cough, chest pain , dyspnea, pleural effusion, chronic symptoms include interstitial pneumonitis and pulmonary fibrosis

Dose: *oral*: *acute uncomplicated infection*, ADULT, 50 mg every 6 hours with food for 7 days (3 days usually adequate in women); CHILD, over 3 months, 750 micrograms/kg every 6 hours; *severe chronic recurrent infection*, 100 mg every 6 hours with food for 7 days (dose reduced or discontinued if severe nausea); *prophylaxis*, 50–100 mg at night; CHILD over 3 months, 1 mg/kg at night

Proprietary Preparations
Nintoin *(Incepta),* Tab., 100 mg, Tk. 6.00/Tab.; Susp., 25 mg/5 ml, Tk. 80/100 ml; SR Cap., 100 mg, Tk. 20.00/Cap.
Ofuran *(Pacific),* SR Tab., 100 mg, Tk. 15.04/Tab.
Umactin, *(Unimed),* Tab., 50 mg, Tk. 4/Tab.; 100 mg, Tk.8.00/Tab.; Susp.,25 mg/5 ml, Tk. 80.00/Tab.
Urobak *(Opsonin),* Tab., 100 mg, Tk. 4.51/ Tab.; Susp 25 mg/5 ml, Tk. 45.11/100 ml
Urocure *(Square),* Susp., 25 mg/5 ml, Tk. 80/100 ml; SR Cap., 100 mg, Tk. 20/Cap.

RIFAXIMIN

Indications: *see under Dose*
Caution: hepatic impairment
Contra-indications: rifamycin hypersensitivity; intestinal obstruction; pregnancy and breast-feeding
Interactions: *see Appendix -2*
Side-effects: nausea, vomiting, abdominal pain, flatulence, diarrhea, dyspnea, headache, depression, dizziness, muscle spasm, rash, pruritus; *less commonly* anorexia, taste disturbances, dry mouth, peripheral edema, sleep disturbances, anxiety, memory impairment, convulsions, hypoesthesia, paraesthesia, antibiotic-associated colitis, influenza-like symptoms, dysuria, polyuria, glycosuria, polymenorrhoea, blood disorders, hyperkalemia; *rarely* blood pressure changes, constipation
Dose: *oral*: *travellers' diarrhea* not associated with fever, bloody diarrhea, blood or leucocytes in the stool, or 8 or more unformed stools in the previous 24 hours: ADULT over 18 years, 200 mg every 8 hours for 3 days; reduction in *recurrence of hepatic encephalopathy*, ADULT over 18 years, 550 mg twice daily

Proprietary Preparation
Hepaximin *(Aristo),* Tab., 550 mg, Tk. 45.00/Tab.; 200mg, Tk. 20.00/Tab.
Rifabac *(Popular),* Tab., 200 mg, Tk.25.00/Tab. ; 550mg, Tk. 65.00/Tab.
Rifacol *(Sharif),* Tab., 200 mg, Tk. 20.00/Tab.; 550mg, Tk. 45.00/Tab.
Rifagut *(Opsonin),* Tab., 200 mg, Tk. 15.04/Tab.; 550mg, Tk. 33.83/Tab.
Rifagyl *(Globe),* Tab., 550 mg, Tk. 45/Tab.; 200 mg, Tk. 20/Tab.
Rifamax *(Incepta),* Tab., 200 mg, Tk.25.00/Tab.; 550mg, Tk. 65.00/Tab.
Rifaxin *(Ziska),* Tab., 200mg, Tk. 20/Tab.; 550mg, Tk. 45/Tab.
Xifamin *(Nipro JMI),* Tab., 200 mg, Tk.20/Tab.

SODIUM FUSIDATE

Fusidic acid and its salts are effective against *Staphylococci,* notably *Staph. aureus* and *Staph. epidermidis* including

methicillin-resistant strains. *Neisseria B. fragilis* and many clostridial strains are also highly susceptible. These drugs are used mainly in the treatment of staphylococcal infections, often in combination with other drugs. They have been used in the treatment of abscess including brain abscess, in bones and joint infections, and topically in the treatment of in eye infections and infections of the skin (See also section 10.2)

Indications: *see notes above*

Cautions: liver function tests required

Side-effects: nausea, vomiting, abdominal pain, reversible jaundice, especially after rapid intravenous injection or infusion; altered liver function tests; neutropenia, eosinophilia, urticaria, rash, thrombophlebitis

Interactions: *see Appendix-2*

Dose: *see section 10.2.*

Proprietary Preparation
see section 10.2.

SPECTINOMYCIN

This is a narrow-spectrum bacteriostatic antibiotic structurally related to aminoglycosides and is effective against a number of gram-negative organisms but is inferior to other drugs to which such organisms are susceptible.
Indications: recommended as alternative treatment for uncomplicated gonococcal infection in patients who are intolerant or allergic to beta-lactam drugs and fluoroquinolones
Cautions: renal and hepatic impairment
Interactions: *see Appendix-2*
Side-effects: nausea, dizziness, urticaria, fever; rarely nephrotoxicity and anemia
Dose: deep IM inj. a single dose of 2 g or 40 mg/kg

Proprietary Preparation
Tinobac *(Incepta*) Inj., 2 gm/vial, Tk.250/vial

TEICOPLANIN

Indications: treatment of serious Gram-positive infection including endocarditis, dialysis-associated peritonitis; prophylaxis in orthopedic surgery at risk of infection with Gram-positive organisms
Cautions: blood count, kidney and liver function tests required; vancomycin sensitivity; monitoring of auditory function if other nephrotoxic or neurotoxic drugs given; pregnancy

Interactions: *see Appendix -2*
Side-effects: rush, pruritus; rarely, nausea, vomiting, diarrhea, dizziness, bronchospasm, mild hearing loss, vestibular disorders; also reported, renal failure, Stevens-Johnson syndrome, toxic epidermal necrolysis
Dose: *IV inj. or infusion,* ADULT > 70 kg body weight, initially 400 mg 12 hourly for 3 doses, then (may be given by IM inj.) 400 mg once daily; CHILD over 2 months, IV inj. or infusion, initially 10 mg/kg (max. 400 mg) 12 hourly for 3 doses, then 6 mg/kg (max. 200 mg) once daily

Proprietary Preparations
Targocid[(I)] *(Gruppo),* Inj., 200 mg/Vial, Tk. 872.08/Vial; 400 mg/Vial, Tk. 1568.62/Vial
Tergocin *(Incepta),* Inj., 200mg/vial, Tk.1600/vial

TIGECYCLINE

Tigecycline should be reserved for the treatment of complicated skin and soft-tissue infections and complicated abdominal infections caused by multiple-antibacterial resistant organisms when other antibacterials cannot be used; it is not recommended for the treatment of foot infections in patients with diabetes.
Indications: *see notes above*
Cautions: cholestasis; dose reduction in hepatic impairment; also see under tetracyclines
Contra-indications: hypersensitivity to tetracyclines
Interactions: *see Appendix -2*
Side-effects: nausea, vomiting, abdominal pain, dyspepsia, diarrhea,

anorexia, bilirubinaemia, dizziness, headache, hypoglycaemia, prolonged prothrombin time, prolonged activated partial thromboplastin time, rash, pruritus, and injection-site reactions; *less commonly* pancreatitis, cholestatic jaundice, and hypoproteinaemia; also reported, antibiotic-associated colitis, hepatic failure, thrombocytopenia, Stevens-Johnson syndrome

Dose: *IV infusion*: ADULT, over 18 years, initially 100 mg, then 50 mg every 12 hours for 5–14 days; initially 100 mg then 25 mg every 12 hours in *severe hepatic impairment*

Proprietary Preparations

Tigacil *(Incepta),* Inj. 50 mg/Vial, Tk. 500/Vial

VANCOMYCIN

Vancomycin is a glycopeptide antibiotic that is used in the treatment of serious *Staphylococcal* or other Gram-positive infections where other drugs such as the penicillins cannot be used because of resistance or patient intolerance. It is used in the in the prophylaxis and treatment of endocarditis *by intravenous route.* It has a relatively long duration of action and can therefore be given every 12 hours. Vancomycin (added to dialysis fluid) is also used in the treatment of peritonitis associated with continuous ambulatory peritoneal dialysis. Vancomycin is given by mouth in antibiotic associated colitis. Vancomycin should not be given by mouth for systemic infection since it is not significantly absorbed.

Indications: *see notes above*

Cautions: hypersensitive to it; should not be given intramuscularly; avoid rapid infusion; rotate infusion site; renal impairment; elderly; avoid if history of deafness; all patients require plasma vancomycin measurement (after 3 or 4 doses if renal function normal, earlier if renal impair-ment), blood counts, urinalysis, and renal functions test; monitor auditory function in elderly or if renal impairment; pregnancy and breast feeding; systemic absorption may follow oral administration especially in inflammatory bowel disorders or following multiple doses

Interactions: *see Appendix-2*

Side-effects: ototoxicity (discontinue if tinnitus occurs); flushing of the upper body (“red man” syndrome); nephro-toxicity including renal failure and interstitial nephritis; blood disorders including neutropenia (usually after receiving dose of 25g); rarely agranulocytosis; and thrombocytopenia; nausea; eosinophilia; anaphylaxis, rashes including, exfoliative dermatitis; and toxic epidermal necrolysis; phlebitis; on rapid infusion, severe hypotension (including shock and cardiac arrest); wheezing, dyspnea; urticaria, pruritus

Dose: *oral,* in antibiotic associated colitis, 125mg every 6 hours for 7 to 10days; dose may be increased if infection is severe or fails to respond. CHILD, 5mg/kg every 6 hours, over 5 years half adult dose; *By intravenous infusion*, 500mg over at least 60 minutes every 12 hours, ELDERLY, over 65 years, 500mg every 12 hours or 1g once daily; NEONATE up to 1week,15mg/kg initially then 10mg/kg every 12 hours; INFANT 1-4weeks, 15mg/kg initially then 10mg/kg every 8 hours; CHILD over 1month, 10mg/kg every 6 hours

Note: plasma concentration monitoring required; pre-dose concentration should be 5-10mg/L

Proprietary Preparations

Covan *(Renata),* Inj., 1 gm/Vial, Tk. 480.00/Vial; 500 mg/Vial, Tk. 250.00/Vial
Vancobac *(Popular),* Inj., 1 gm/Vial, Tk. 552.08/Vial; 500 mg/Vial, Tk. 321.21/Vial
Vancard *(Techno),* Inj., 1 gm/Vial, Tk. 850.00/Vial; 500 mg/Vial, Tk. 470.00/Vial
Vanmycin *(Incepta),* Inj., 1 gm/Vial, Tk. 480.00/Vial; 500 mg/Vial, Tk. 250.00/Vial
Vancomin *(Opsonin),* Inj., 1 gm/Vial, Tk. 362.26/Vial; 500 mg/Vial, Tk. 188.68/Vial

1.2 ANTIFUNGALS

1.2.1 SYSTEMIC ANTIFUNGALS FOR SYSTEMIC FUNGAL INFECTIONS

AMPHOTERICIN B *(see section 1.3.5)*
Is an amphoteric polyene macrolide nearly insoluble lele in in water and exhibits broad-spectrum fungicidal activity. The drug is effective against clinically significant yeasts, including C. albicans and Cryptococcus neoformans, the organisms causing endemic mycoses including Histoplasma capsulatum, Blastomyces dermatitidis and Coccidioides immitis and the pathogenic molds, such as Aspergillus fumigatus and mucor. It has limited activity against the protozoa L. braziliensis and Naegleria fowleri.

Indications: drug of choice for initial induction regimen for life-threatening mycotic infections such as severe fungal pneumonia, cryptococcal meningitis, sepsis syndrome, for empiric therapy in cancer patients with neutropenia, mycotic corneal ulcers and keratitis, fungal arthritis, candiduria
Cautions: renal impairment; hepatic and renal-function tests, blood counts, and plasma electrolyte monitoring required, if any abnormality therapy should be discontinued; pregnancy and breast-feeding; when given parenterally, toxicity common (close supervision necessary and test dose required); rapid infusion (risk of arrhythmias) and concurrent corticosteroids therapy need to be avoided

Contra-indications: hypersensitivity
Interactions: *see Appendix -2*
Side-effects: when given parenterally, anorexia, nausea and vomiting, diarrhea, epigastric pain; febrile reactions, headache, muscle and joint pain; anemia; disturbances in renal function with renal tubular acidosis, hypokalemia and hypomagnesemia; cardiovascular toxicity including arrhythmias; blood disorders; neurological disorders including hearing loss, diplopia, convulsions, peripheral neuropathy, abnormal liver function; rash, anaphylactoid reactions; pain and thrombophlebitis at injection site; encephalopathy rarely
Dose:*by slow IV infusion,* 0.5-1 mg/kg/d, continued to a total dose of 1-2 g;
oral: intestinal candidiasis, 100-200 mg every 6 hours; INFANT and CHILD 100 mg 4 times daily, prophylaxis NEONATE 100 mg once daily; oral and perioral infections, amphotericin 10 mg lozenges, 1 lozenge to dissolve slowly in the mouth 4 times daily for 10-15 days or 100 mg suspension placed in the mouth after food and retain near lesions 4 times daily for 14 days, therapy should be continued for 48 hours after lesions have resolved.

Proprietary Preparation
Tericin *(Beacon),* Inj. 50mg/vial, Tk.15000/Vial

FLUCONAZOLE[ED]

Indications: *see under Dose*
Cautions: renal insufficiency, in severe form dose interval should be increased from 24 to 48 or 72 hours; breast-feeding; monitoring of liver function is required in prolonged and or high dose therapy, drug should be stopped if evidence of hepatic necrosis
Contra-indications: pregnancy, severe liver disease, acute porphyria
Interactions: *see Appendix-2*
Side-effects: nausea, abdominal discomfort, diarrhea, and flatulence, occasionally abnormalities of liver enzymes, rarely rash, angioedema, anaphylaxis, Stevens-Johnson syndrome and fixed drug eruption; skeletal and cardiac deformities in infants born to women taking high doses during pregnancy has also been reported
Dose: candidiasis: oropharyngeal candidiasis, orally, 200 mg on the first day then 100 mg daily for 2 weeks;

esophageal candidiasis, orally, 100-200 mg daily; vaginal candidiasis and candidial balanitis, orally, 150 mg as a single dose; deep candidiasis in allogenic bone marrow transplant recipients and candidemia in non-immunocompromised patients, orally, 400 mg daily; CHILD oral or IV infusion, 3-6 mg/kg on first day then 3 mg/kg daily, every 72 hours in NEONATE up to 2 weeks old, every 48 hours in NEONATE 2-4 weeks old; Tinea pedis, corporis, cruris, pityriasis versicolor, and dermal candidiasis, orally, 50 mg daily for 2-4 weeks for up to 6 weeks in tinea pedis; cryptococcosis including meningitis, oral or IV infusion, 400 mg daily for initial 8 weeks, then 200 mg daily; CHILD 6-12 mg/kg daily, every 72 hours in NEONATE up to 2 weeks old, every 48 hours in NEOANTE 2-4 weeks old, max. 400 mg daily; prevention of relapse of cryptococcal meningitis in AIDS patients after completion of primary therapy, 100-200 mg daily; coccidioidomycosis including meningitis, oral or by IV infusion, 200-400 mg daily; prevention of fungal infections in immunocompromised patients following cytotoxic chemotherapy or radiotherapy, oral or by IV infusion, 50-400 mg daily adjusted according to risk; CHILD according to extent and duration of neutropenia, 3-12 mg/kg daily, every 72 hours in NEONATE up to 2 weeks old, every 48 hours in NEONATE 2-4 weeks old, max. 400 mg daily

Proprietary Preparations
see section 12.2.

ITRACONAZOLE

This is a synthetic triazole having mechanism and antifungal spectrum of activity similar to those of fluconazole.
Indications: *see under Dose*
Cautions: absorption is impaired in AIDS, neutropenia and when gastric acidity is reduced; the drug should be administered at least two hours after antacid or a full meal; monitoring of liver function in prolonged therapy, dose adjustment in renal impairment, liver disease, risk of heart failure with high dose, drug should be discontinued if peripheral neuropathy;
Contra-indications: severe hepatic impairment, acute porphyria; pregnancy
Interactions: *see Appendix-2*
Side- effects: *see under fluconazole*; also heart failure, hypertriglyceridemia, hypertension, peripheral neuropathy; in prolonged therapy hypokalemia, edema, and hair loss; rhabdomyolysis is also in report
Dose: *oral*: oropharyngeal candidiasis, 100 mg daily, 200 mg daily in AIDS or neutropenia for 15 days; vulvovaginal candidiasis, 200 mg twice daily for 1 day; pityriasis versicolor, 200 mg daily for 7 days; tinea corporis and tinea cruris, 100 mg/d for 15 days or 200 mg/d for 7 days; tinea pedis and manuum, 100 mg daily for 30 days or 200 mg twice daily for 7 days; onychomycosis, 200 mg daily for 3 months; histoplasmosis, 200 mg 1-2 times daily; systemic aspergillosis, candidiasis and cryptococcosis including cryptococcal meningitis, histoplasmosis where other antifungal drugs inappropriate or ineffective, 200 mg once daily, IV infusion: 200 mg every 12 hours for 2 days, then 200 mg once daily for max. 12 days; maintenance in AIDS patients to prevent relapse of underlying fungal infection and prophylaxis in neutropenia when standard therapy inappropriate, 200 mg once daily

Proprietary Preparations
Itra *(Square),* Cap., 100 mg, Tk. 15.05/Cap.
Iconal *(Kemiko),* Cap., 100 mg, Tk. 15/Cap.
I-Zol *(Popular),* Cap., 100 mg, Tk. 15.06/Cap.

KETOCONAZOLE

Indications: systemic mycoses, serious chronic resistant mucocutaneous candidiasis, serious mycoses of gut not responsive to other therapy, chronic vaginal candidiasis not responsive to other therapy, dermatophytes infections not responsive to other therapy excluding infection of the toe nails, prophylaxis of mycoses in patients with

reduced immune responses
Cautions: *see notes above*; also monitoring for signs of liver disease during and after treatment; liver function tests before, during and after treatment; porphyria
Contra-indications: hepatic impairment, pregnancy, breast-feeding
Interactions: *see Appendix* -2
Side-effects: nausea, anorexia, vomiting, rashes, pruritus, hepatitis; gynaecomastia, decreased libido and potency in males, at high doses azoospermia has been reported; also hypertension, fluid retention, asymptomatic elevation of aminotransferase
Dose: *oral*: ADULT 200 mg once daily, increased to 400 mg if required; CHILD 3.3-6.6 mg/kg daily; duration of therapy: 5 days for candida vulvovaginitis, 2 weeks for candida esophagitis and 6-12 months for deep mycoses; prophylaxis and maintenance treatment in immunosuppressed patients, 200 mg daily

Proprietary Preparations
see section 12.2.

VORICONAZOLE

Indications: invasive aspergillosis, invasive fluconazole-resistant Candida spp. Including C krusei, serious infection caused by *Scedosporium spp., Fusarium spp.*
Cautions: monitoring of hepatic and renal function and skin cancer surveillance required; also see Notes above
Contraindications: acute porphyria
Interactions: *see Appendix-2*
***Si*de-effects:** nausea, vomiting, diarrhea, jaundice, edema, hypotension, chest pain, respiratory distress syndrome, headache, dizziness, anxiety, hallucination, paraesthesia, tremor, hypoglycemia, hematuria, blood disorders, acute renal failure, hypokalemia, visual disturbances; less commonly, hepatitis, cholecystitis, pancreatitis, arrhythmias, ataxia, nystagmus, adrenocortical insufficiency;
Dose: *oral*: ADULT and CHILD over 12 years, body-weight over 40 kg, 400 mg 12 hourly for 2 doses then reduced to 200 mg; body-weight under 40 kg, 200 mg 12 hourly for 2 doses then reduced to 100 mg;
IV infusion, 6 mg/kg 12 hourly for 2 doses then reduced to 4 mg/kg

Generic Preparation
Tablet, 200 mg; 50 mg; Syrup, 200 mg/5 ml

1.2.2 SYSTEMIC ANTIFUNGALS FOR MUCOCUTANEOUS INFECTIONS

(see section 12.2.2)

GRISEOFULVIN[ED]

This is a narrow-spectrum fungistatic drug given orally and is the choice of treatment for extensive and intractable fungal infections of the **Indications:** fungal infections of skin, hair, nails and scalp where topical therapy is inappropriate or failed
Cautions: may impair performance of skilled tasks, aggravation of systemic lupus erythematosus; breast-feeding, pregnancy should be avoided during therapy and for 1 month after treatment, men should not father children within 6 months of treatment
Contra-indications: severe liver disease, lupus erythematosus and related conditions, acute porphyria
Interactions: *see Appendix-2*
Side-effects: hepatotoxicity, photosensitivity, urticaria, erythematous rashes, mental confusion, peripheral neuritis, headache, nausea, vomiting, vertigo, gastric discomfort, augmentation of alcohol effects, transient macular edema
Dose: *oral*: 500 mg daily, in divided doses or as a single dose, in severe infection dose may be doubled; CHILD 10 mg/kg daily in divided doses or as a single dose

Proprietary Preparations
see section12.2

TERBINAFINE

Indications: fungal infections of the skin and nails; ringworm infections including tinea pedis, cruris and corporis
Cautions: pregnant and breast-feeding women; hepatic and renal impairment; psoriasis, autoimmune disease
Contra-indications: hypersensitivity
Interactions: *see Appendix-2*
Side-effects: gastrointestinal distress, mild abdominal pain, skin reactions (rash, urticaria), headache; rarely hepatotoxicity, severe neutropenia, Stevens-Johnson syndrome or toxic epidermal necrolysis may occur; very rarely, psychiatric disturbance, blood disorders
Dose: *oral*: onychomycosis of nails, 250 mg daily for 3 months; duration of oral therapy for ringworm infections is 2-6 weeks with local application of cream twice daily

Proprietary Preparation
see section12.2.

1.2.3 TOPICAL ANTIFUNGALS

Superficial fungal infections including dermatophytosis (ringworm), candidiasis, tinea versicolor, piedra, tinea nigra and fungal keratitis are treated successfully by topical antifungals with or without concomitant administration of systemic antifungal drugs. Topical administration of antifungal is usually not successful for mycoses of the nails (onychomycosis) and hair (tinea capitis) and not recommended for subcutaneous mycoses (sporotrichosis and chromomycosis). Besides the type of lesion and mechanism of drug's action, viscosity, hydrophobicity and acidity of the formulation are important determinants of the efficacy of topical agents in superficial mycoses. Because of the poor penetration of the topical drugs into hyperkeratotic lesions, removal of the thick keratin is a useful adjunct to therapy.
(see section 12.2.2)

CLOTRIMAZOLE[ED]

(see section 12.2.2& 6.2.2)

ECONAZOLE

(see section 12.2.2& 6.2.2)

MICONAZOLE[ED]

(see section 12.2.2)

NYSTATIN[ED]

(see section 12.2.2 & 6.2.2)

Indications: candidiasis of mouth, esophagus or intestinal tract, vaginal candidiasis, skin infection, perineal pruritus
Cautions: if irritation or sensitization develops, treatment should be discontinued, pregnancy
Contra-indications: hypersensitivity
Interactions: *see Appendix -2*
Side-effects: nausea, vomiting, diarrhea, local irritation or burning sensation may occur in few cases; rarely Stevens-Johnson syndrome
Dose: *oral*: intestinal candidiasis 500,000 units every 6 hours, doubled in severe infections; CHILD 100,000 units every 6 hour; prophylaxis, 1 million units once daily; NEONATE 100,000 units once daily

Proprietary Preparations
Candex*(Square),* Susp., 1 Lac IU/ ml, Tk. 22.73/12 ml
Canstat *(Jayson),* Susp., 1 Lac IU/ ml, Tk. 17.20/10ml
Fefun *(Amico),* Susp., 1 Lac IU/ ml, Tk. 21.00/12 ml
Fungistin *(Beximco),*Susp.,1 Lac IU/ml,Tk. 22.74/12 ml
Mycocin *(Ibn Sina),* Susp., 1 Lac IU/ ml, Tk. 21.00/12ml
Mycocin *(Ibn Sina),* Tab. , 5 Lac IU, Tk. 5.05/Tab.
Naf *(Opsonin),* Susp., 1 Lac IU/ ml, Tk. 15.39/12 ml
Nyst *(Somatec),* Susp., 1 Lac IU/ ml, Tk. 22.59/12 ml
Nystat *(Acme),* Susp., 1 Lac IU/ ml, Tk. 22.73/12 ml
Nystat *(Acme),* Tab., 5 Lac IU, Tk. 6.25/Tab.

Ornys *(Kemiko),* Susp., 1 Lac IU/ ml, Tk. 20.46/12 ml

TIOCONAZOLE

(see section 12.2.2 & 6.2.2)

Tioconazole, an imidazole, is used for the treatment of Candida vulvovaginitis. A single 4.6 g dose of ointment containing 6.5% drug is given at bedtime.

1.3 ANTIPROTOZOAL DRUGS

1.3.1 ANTIMALARIALS
1.3.2 AMEBICIDES
1.3.3 TRICHOMMONOCIDES
1.3.4 ANTIGIARDIAL DRUGS
1.3.5 LEISHMENIACIDES

1.3.1 ANTIMALARIA DRUGS

The patterns of clinically useful activity of the antimalaria drugs fall into three general categories. The first category of agents has activity against the asexual blood stages responsible for disease and are not reliably effective against primary or latent liver stages. These drugs are used to treat, or prevent, clinically symptomatic malaria. When used as chemoprophylaxis, they should be continued for several weeks after exposure, until parasites complete their intrahepatic stage of development and become susceptible to therapy. First category drugs are artemisinin and its derivatives **artemether** and **artesunate**, **chloroquine**, **mefloquine, pyrimethamine, quinine** and **quinidine, sulfadoxine and tetracycline**. The second category drugs, typified by atovaquone and proguanil, have expanded spectrum which target not only the asexual erythrocytic forms but also the primary liver stages *of P. falciparum*. Period for post exposure chemoprophylaxis with these drugs shortens to several days for this additional activity. The third category, currently exemplified solely by primaquine is effective against primary and latent liver stages as well as gametocytes.

CHEMOTHERAPY OF MALARIA

(see also Appendix-1)

Malaria transmitted by female anopheles mosquitoes is caused by four species of plasmodia: vivax, falciparum, ovale and malariae. The parasites causing fever in Bangladesh are mainly *P. vivax* which causes benign tertian malaria, and *P. falciparum* which causes more severe malignant tertian or cerebral malaria. Certain tissue forms of vivax (hypnozoites) persist in liver for many months and may cause relapse. Such latent forms are not generated by *P. falciparum*; however recurrence of its infection will result from persistent blood forms (schizontocides) in inadequately treated or untreated patients. Some blood forms (merozoits) develop into gametocytes which when ingested by the mosquito continue the parasites' life cycle in mosquito.

Chemoprophylaxis: As no antimalarial drug kills sporozoites, which initiate infection in humans, it is not truly possible to prevent infection. Drugs can only prevent the development of symptomatic malaria either by clinical suppression (keeping the parasite count in blood below threshold level of clinical attack) or by causal prophylaxis (destroying pre-erythrocytic intrahepatic forms of parasites).

Prophylaxis for infections with chloroquine-sensitive P. falciparum P. vivax. P. malariae, and *P. ovale*:

ADULT 500 mg of chloroquine phosphate (300 mg of base) weekly starting one week before entering an endemic area and continuing until 4 weeks after leaving; CHILD, 8.3 mg/kg of chloroquine phosphate (5 mg base per kg) taken orally by the same schedule; in pregnant women chloroquine be maintained in adult dose until delivery;

Prophylaxis for infections with chloroquine-resistant or multidrug-resistant strains of P. falciparum: *Regimens:*

ADULT & CHILD > 45 kg body weight: mefloquine 250 mg tablet weekly starting 1 week before entering an endemic area and ending 4 weeks after leaving;

pediatric doses taken by the same schedule are, CHILD weighing 5-9 kg 31.25 mg, 10-19 kg 62.5 mg, 20-30 kg 125 mg; and for those weighing 31-45 kg 187.5 mg; OR

ADULT doxycycline 100 mg daily; CHILD over 8 years of age, the dosage is 2 mg/kg given once daily, increasing up to the daily adult dose. Prophylaxis with doxycycline should begin 1 day before travel to an endemic area and end 4 weeks after leaving. Note: doxycycline use for malaria prophylaxis should not exceed 4 months; it should not be given to children less than 8 years of age or to pregnant women

OR

Proguanil hydrochloride with **chloroquine phosphate**: oral: proguanil, ADULT & CHILD > 10 years, 200 mg daily upon entry into an endemic area and continuing for 4 weeks after leaving; pediatric doses taken by the same schedule are as follows: CHILD < 2 years 50 mg; 2-6 years 100 mg; 7-10 years 150 mg, chloroquine phosphate, as the regimen outlined above for prophylaxis of chloroquine-sensitive plasmodia

Treatment of severe malarial infections

No single antimalarial is effective against all liver and intra-erythrocytic stages of the parasite life-cycle that may co-exist in the same patient, complete elimination of the infection, therefore, may require more than one drug. Treatment of P. falciparum in non-immune patients constitutes medical emergencies because they can progress rapidly to a fatal outcome. Chemotherapy should be initiated promptly and not await parasitological confirmation. Parenteral therapy with quinidine gluconate is advised for severely ill patients who cannot take oral medication; the regimen is identical for all species of plasmodium. Exchange transfusion may benefit some patients with parasitemias of 10% or more

Preferred regimen: ADULT & CHILD Quinidine gluconate intravenously with a loading dose of 10 mg of the salt per kg dissolved in 300 ml of normal saline and infused over 1 to 2 hours (maximum dose 600 mg of the salt) this is followed by continuous infusion at the rate of 0.02 mg of the salt per kg per minute until oral therapy with quinine sulfate is feasible. During administration of quinidine gluconate, blood pressure (for hypotension) and ECG (for widening of the QRS complex and lengthening of QT interval) should be monitored continuously and total blood glucose (for hypoglycemia) periodically; these complications, if severe, warrant discontinuation of the drug. Quinine sulfate can be substituted for quinidine gluconate once patients can take oral medication (see under Quinine); quinidine/quinine is usually given for 3 to 7 days, Adjunctive Therapy for optimal clinical response, any one of the following regimens should be used together with oral quinine sulfate therapy: Doxycycline: ADULT 100 mg orally every 8 hours for 7 days; CHILD > 8 years of age the dosage is 2 mg/kg, increasing up to the adult dose and given by same schedule; tetracycline may be substituted for doxycycline ADULT 250 mg every 6 hours for 7 days whereas the pediatric dosage is 5 mg/kg every 6 ours for 7 days (because the adverse effects on the bones and teeth, tetracycline should not be given to the children less than 8 years old or pregnant women; Pyrimethamine 75 mg + sulfadoxine 1.5 g one dose orally on the last day of quinine sulfate therapy.

Other oral treatment regimens for infections with chloroquine-resistant P.vivax, and chloroquine-resistant or multidrug-resistant strains of P. falciparum: Mefloquine hydrochloride: ADULT 750 mg of the salt taken by mouth followed 12 hours later by 500 mg; the corresponding pediatric dose for children weighing less than 45 kg is 15 mg of the salt per kg followed 12 hours later by 10 mg of the salt per kg; the initial dose should be repeated only if vomiting occurs within the first hour ; Artesunate plus mefloquine hydrochloride: Artesunate given orally at

a dose of 4 mg/kg once on the first day and 2 mg/kg for next 4 days (total dose of 12 mg/kg is the same for adults and children) mefloquine is given once on the second day at the dose of 25 mg base per kg; Atovaquone and proguanil hydrochloride: ADULT 1 g atovaquone plus 400 mg proguanil hydrochloride orally once for 3 days; CHILD, weighing 11-20 kg is 250 mg atovaquone plus 100 mg proguanil hydrochloride; 21-30 kg, 500 mg atovaquone plus 200 mg proguanil hydrochloride; 31-40 kg, 750 mg atovaquone plus 300 mg proguanil hydrochloride, once daily for 3 days
Oral treatment of infections with P. vivax, P.malariae, P. Ovale, and chloroquine-sensitive P. falciparum: Chloroquine phosphate: see under Chloroquine;
Prevention of relapse: therapy with primaquine is started after the acute attack (about day 4), ADULT 26.3 mg (15 mg base) daily for 14 days; CHILD 0.53 mg/kg (0.3 mg base per kg) daily for 14 days; the same primaquine regimen also can be used during the last 2 weeks of chloroquine phosphate prophylaxis for individuals who have left areas endemic for P. vivax or P. ovale infection. Alternatively adults using chloroquine for prophylaxis against P .vivax or P. ovale may take 500 mg of chloroquine phosphate (300 mg base) together with 78.9 mg primaquine phosphate (45 mg base), weekly for 8 weeks starting after leaving an endemic area, for radical cure

ARTEMISININS

Artemisinin has three major semisynthetic derivatives in clinical use, **dihydroartemisinin, artemether and artesunate.** The short plasma $t_{1/2}$ of these drugs often leads to treatment failure when artimisinins are used as monotherapy. Combining an artemisinin derivative with a longer–lasting partner drug ensures sustained antimalarial activity.

ARTEMETHER

This lipid soluble analog of artemisinin is a potent blood schizontocides against all human malaria parasites but not effective against dormant hepatic forms. Artemether also exhibit antiparasitic activity against several other protozoa including *Leishmania* major and *Toxoplasma gondii* and against *schistosomes,* but not used clinically to treat these infections
Indications: treatment of severe malaria including infections due to chloroquine and multidrug-resistant strains of *P. falciparum*
Cautions: cardiac diseases
Contra-indications: first trimester of pregnancy
Interactions: *see Appendix -2*
Side-effects: headache, nausea, vomiting, abdominal pain, dizziness, tinnitus, neutropenia, elevated liver enzyme values; cardiotoxicity (after high dose); neurotoxicity in animal studies
Dose: treatment of P.falciparum malaria (in areas of quinine resistance), by IM inj. ADULT & CHILD > 6 month, loading dose of 3.2 mg/kg daily until patient can tolerate oral medication or to maximum 7 days; this is followed by a single dose of mefloquine 15 mg/kg (or 25 mg/kg) to affect a radical cure

Generic Preparation
Injection 80mg/ml

ARTEMETHER PLUS LUMEFANTRINE[ED]

(Tablet, artemether 20 mg with lumefantrine 120 mg)

Indications: treatment of acute uncomplicated malaria due to *Plasmodium falciparum* mixed infections including *P. falciparum* in areas with significant drug resistance
Cautions: ECG required before and during treatment in cardiac disorder including bradycardia, heart failure, history of arrhythmias, QT interval prolongation, electrolyte disturbances, concomitant administration of drugs that prolonged QT interval; patients unable to

take food require monitoring (greater risk of recrudescence); severe renal impairment or hepatic impairment, avoid in acute porphyria; dizziness may affect performance of skilled tasks (e.g. driving); pregnancy, breast-feeding

Contra-indications: family history of sudden death, congenital prolongation of QT interval, history of arrhythmias, of clinically relevant bradycardia, and of congestive heart failure accompanied by reduced left ventricular ejection fraction
Interactions: *see Appendix -2*

Side-effects: abdominal pain, anorexia, diarrhea, nausea and vomiting, headache, dizziness, sleep disorders; palpitations, arthralgia, myalgia; cough, asthenia, fatigue; pruritus, rash; *less commonly* ataxia, hypoesthesia, and clonus

Dose: *oral*: treatment of uncomplicated falciparum malaria, ADULT & CHILD > 12 years and body weight > 35 kg, initially 4 tablets followed by 5 doses of 4 tablets each after 8, 24, 36, 48 and 60 hours (total 24 tablets over 60 hours); CHILD body-weight 10-14 kg initially 1 tablet followed by 5 doses of 1 tablet each after 8, 24, 36, 48 and 60 hours (total 6 tablets over 60 hours); body-weight 15-24 kg initially 2 tablets followed by 5 doses of 2 tablet each after 8, 24, 36, 48 and 60 hours (total 12 tablets over 60 hours); body-weight 25-34 kg, initially 3 tablets followed by 5 doses of 3 tablet each after 8, 24, 36, 48 and 60 hours (total 18 tablets over 60 hours)

Proprietary Preparations
Arexel *(Jayson),* Tab. 20 mg + 120 mg, Tk. 17.06/Tab.
Artemet *(Incepta),* Tab. 20 mg + 120 mg, Tk. 20.00/Tab.
Coavlon *(ACI),* Tab. 20 mg + 120 mg,Tk. 20.08/Tab.
Lumertam *(Square),* Tab. 20 mg + 120 mg,Tk. 20.07/Tab.

ARTESUNATE[ED]

This water-soluble analog of artemisinin is useful for oral, IV, IM and rectal administration. The drug exhibits similar pharmacological profile like that of artemether (*see above).*
Indications: treatment of uncomplicated P. falciparum malaria in areas of multiple-drug resistance

Cautions: risk of recurrence if used alone in non-immune patients; also see under artemether

Contra-indications: first trimester of pregnancy
Interactions: *see Appendix-2*

Side-effects: headache, nausea, vomiting, abdominal pain, diarrhea, dizziness, tinnitus, neutropenia, elevated liver enzyme values; ECG abnormalities, including prolongation of QT interval; temporary suppression of reticulocyte response and induction of black-water fever, reported neurotoxicity-in animal studies
Dose: *oral*: treatment of *uncomplicated P. falciparum* malaria (in an areas of multiple-drug resistance), ADULT & CHILD > 6 months, 4 mg/kg daily for 3 days; a single dose of mefloquine 15 mg/kg (or 25 mg/kg,) is given on day 2 or 3 to affect a radical cure; if artesunate used alone, treatment should be continued for 7 days

Proprietary Preparation
Artex *(Jayson),* Tab. 50 mg, Tk. 12.05/Tab.

CHLOROQUINE[ED]

Chloroquine is highly effective against all the forms of blood schizontes and also moderately effective against gametocytes of *P. vivax, P. ovale and P. malariae* but not against those of *M. falciparum* and liver stage parasites. It has a fairly marked anti-inflammatory action and to some extent quinidine-like action on the heart. Chloroquine is rapidly and nearly completely absorbed from gut and has a tendency to accumulate in eye and liver. Chloroquine is cleared principally through kidneys both in unchanged form and as metabolite.

Chloroquine is used for the prophylaxis of malaria in areas of the world where the risk of chloroquine-resistant falciparum malaria is still low.

Indications: chemoprophylaxis and treatment of malaria *(see notes above)*; rheumatoid arthritis, lupus erythematosus, adjunct to metronidazole in extra-intestinal amebiasis

Cautions: impaired renal and hepatic functions **(**avoid concurrent therapy with hepatotoxic drugs**);** neurologic or hematologic disorders**,** G6PD deficiency**;** may aggravate myasthenia gravis**,** psoriasis;

Contra-indications: psoriasis, porphyria, retinal or visual field abnormalities, myopathy

Interactions: *see Appendix -2*
Side-effects: pruritus, anorexia, malaise, headache, nausea, vomiting, abdominal pain, diarrhea, blurring of vision, rashes, urticaria; rarely psychotic episodes, convulsions, depigmentation and loss of hair, impaired hearing, hemolysis in G-6PD deficient patients, agranulocytosis, exfoliative dermatitis, hypotension, QRS widening and T wave abnormalities in ECG; long-term administration of high doses for rheumatologic diseases can result in irreversible ototoxicity, retinopathy, myopathy and peripheral neuropathy; large IM inj. or rapid IV infusion can cause severe hypotension and respiratory and cardiac arrest
Dose: *oral*: *Treatment of non-falciparum malaria*, ADULT initial dose of 620 mg of base *then* a single dose of 310 mg of base after 6 to 8 hours *then* a single dose of 310 mg of base daily for 2 days (approximate total cumulative dose of 25 mg/kg of base);
CHILD initial dose of 10 mg base/kg then a single dose of 5 mg base /kg after 6-8 hours followed by single dose of 5 mg base/kg daily for 2 days; rheumatic disease, 150 mg base daily, max. 2.5 mg base/kg daily; CHILD up to 3 mg base/kg daily; *Prophylaxis of malaria,* started 1 week before entering endemic area and continued for 4 weeks after leaving, 310 mg once weekly; child up to 6 weeks body-weight under 4.5 kg, 25 mg once weekly; 6 weeks–6 months body-weight 4.5–8 kg, 50 mg once weekly; 6 months–1 year body-weight 8–11 kg, 75 mg once weekly; 1–3 years body-weight 11–15 kg, 100 mg once weekly; 3–4 years body-weight 15–16.5 kg, 125 mg once weekly; 4–8 years body-weight 16.5–25 kg, 150 mg once weekly (or 155 mg once weekly if tablets used); 8–13 years body-weight 25–45 kg, 225 mg once weekly (or 232.5 mg once weekly if tablets used); over 13 years, body-weight over 45 kg, adult dose

Proprietary Preparations
Avloquin *(ACI),* Syrup, 125 mg/5 ml, Tk. 14.87/60 ml; Tab. , 250 mg , Tk. 1.22/Tab.
Clit *(Hudson),* Syrup, 125mg/5ml, Tk.12.00/60 ml; Tab., 250mg, Tk.1.20/Tab.
Jasochlor *(Jayson),* Tab. , 250 mg, Tk. 1.21/Tab.; Syrup, 80 mg/5 ml, Tk.14.87/60ml
Malorin *(Albion),* Syrup, 80 mg/5 ml, Tk. 12.50/60 ml
Quinolex *(Globe),* Syrup, 80 mg/5 ml, Tk. 12.00/60 ml; Tab., 250 mg, Tk. 1.00/Tab.
Supraquin *(Supreme),* Syrup, 75 mg/5 ml, Tk. 14.40/60 ml; Tab., 250 mg, Tk.1.20/Tab.

MEFLOQUINE[ED]

Mefloquine, chemically related to quinine, is a highly effective blood schizontocides, particularly against mature trophozoite and schizont forms of malarial parasites. It is not effective against hepatic stages and mature gametocytes of P. falciparum or latent tissue forms of P. vivex. It is now used for prophylaxis and rarely for the treatment of falciparum malaria because of increased resistance. Better tolerated alternatives being available, it is not a preferred choice for the treatment of non-falciparum malaria as well. Only oral administration is recommended as parenteral use can cause severe local irritation. Mefloquine eliminates very slowly, allowing a single-dose treatment regimen.
Indications: prophylaxis of malaria in areas where there is a high risk of chloroquine-resistant falciparum malaria; *also see notes above*

Cautions: severe hepatic and renal impairment; traumatic brain injury; may impair fine motor skills like airplane piloting or car driving (may occur and persist up to several months after stopping the drug); patient counseling to discontinue mefloquine and to seek immediate medical attention if neuropsychiatric symptoms appear
Contra-indications: should not be used for treatment if it has been used for prophylaxis; epilepsy, psychiatric disorders and history thereof including depression or convulsions (for prophylaxis); cardiac arrhythmia and conduction defects; hypersensitivity to quinine; also not recommended for use in first trimester of pregnancy and in children weighing less than 5 kg and / or < 3 months
Interactions: *see Appendix -2*
Side-effects: *may occur and persist up to several months after discontinuation:* nausea, vomiting, diarrhea, abdominal pain, dizziness, loss of balance, headache, somnolence, sleep disorders; neuropsychiatric reactions like depression, (suicidal ideation and suicide reported), confusion, acute psychosis or seizures; tinnitus, vestibular disorders, visual disturbances, circulatory disorders, bradycardia, cardiac conduction disorders, muscle weakness, myalgia, arthralgia, rash, urticaria, pruritus, alopecia, asthenia, malaise, fatigue, fever, loss of appetite, leucopenia or leukocytosis, thrombocytopenia, aminotransferase elevation
Dose :*oral*: prophylaxis: starting 2–3 weeks before entering endemic area and continued for 4 weeks after leaving: ADULT and CHILD body-weight over 45 kg, 250 mg once weekly; body-weight 5–16 kg, 62.5 mg once weekly; body-weight 16–25 kg, 125 mg once weekly; body-weight 25–45 kg, 187.5 mg once weekly; for treatment, ADULT & CHILD 20 mg base/kg (max. 1.5 g) as a single or preferably in 2 divided doses 6-8 hours apart daily for 3 days; also *see Notes above*

Proprietary Preparation
Meflon *(ACI),* Tab. 250mg, Tk. 39.49/Tab.

PRIMAQUINE[ED]

Primaquine is highly effective against dormant liver forms of P. vivax and P. ovale. The drug is well absorbed orally and is rapidly metabolized into metabolites which have high potential for hemolysis. The metabolites are excreted in the urine.
Indications: radical cure of P. vivax and P. ovale malaria; with clindamycin an alternative to co-trimoxazole for pneumocystis carinii infection
Cautions: pregnancy (risk of neonatal hemolysis and methemoglobinemias in third trimester); breast-feeding, G-6PD deficiency *(see notes above),* diseases associated with granulocytopenia i.e. rheumatoid arthritis, lupus erythematosus
Contra-indications: hemolytic anemia
Interactions: *see Appendix -2*
Side-effects: anorexia, nausea, vomiting, jaundice, less commonly, mild diarrhea, methemoglobinemias, hemolytic anemia especially in G6PD deficiency, agranulocytosis, cardiac arrhythmia
Dose: *oral*: ADULT 15 mg daily for 14-21 days following a course of chloroquine; CHILD, over 6 months of age:
(specialist advice should be sought for children under 6 months of age); in *P. vivax* infection, 500 micrograms/kg (max. 30 mg) daily for 14 days, and for *P. ovale,* 250 micrograms/kg (max. 15 mg) daily for 14 days;
PREGNENCY: the radical cure with primaquine should be **postponed** until the pregnancy is over; instead chloroquine should be continued at a dose of 310 mg each week during the pregnancy

Proprietary Preparations
Jasoprim *(Jayson),* Tab.,15mg, Tk.1.26/Tab
Kanaprim, *(Globe),* Tab., 15 mg, Tk. 0.62/Tab.
P-Phos, *(Hudson),* Tab., 15mg, Tk. 0.62/Tab.
Remaquin *(ACI),* Tab., 15 mg, Tk.1.51/Tab.

PYRIMETHAMINE[ED]

Pyrimethamine is a slowly acting blood schizontocides and more potent than proguanil. Unlike proguanil it is not effective against hepatic forms of falciparum. At therapeutic doses, pyrimethamine cannot eradicate latent hepatic forms of P. vivax or gametocytes of any plasmodial species. Pyrimethamine also is effective against toxoplasma gondii. It is completely absorbed from gut and tends to accumulate in kidneys, lungs, liver and spleen. Pyrimethamine is cleared principally by renal route both as unchanged drug and as metabolites.
Indications: with sulfadoxine (not recommended in UK for the *prophylaxis)* for treatment of falciparum malaria with (or following) quinine; with sulfadiazine for treatment of toxoplasmosis in immunocompromised patients; also see Notes above
Cautions: renal or hepatic insufficiency, folate supplements required in pregnancy, breast-feeding (avoid use of other folate antagonists to infant; avoid breast-feeding during toxoplasmosis treatment); blood count monitoring required in prolonged therapy; history of seizures (avoid large loading doses)
Interactions: *see Appendix -2*
Side-effects: depression of hematopoiesis with prolonged treatment; nausea, vomiting, diarrhea; headache, dizziness, rashes; *less commonly* fever, abnormal skin pigmentation; *very rarely* colic, buccal ulceration, convulsions
Dose: *see Pyrimethamine with Sulfadoxine below*

Proprietary Preparations
see Pyrimethamine with Sulfadoxine below

PYRIMETHAMINE WITH SULFADOXINE[ED]

Indications: adjunct to quinine in the treatment of *P.falciparum* malaria

Cautions: *see under Pyrimethamine* and under Co-trimoxazole (section 1.1.8.); not recommended for prophylaxis because of severe side-effects on long-term use; (pyrimethamine, sulfonamides); possible teratogenic risk in *first trimester* (pyrimethamine a folate antagonist); in *third trimester* risk of neonatal hemolysis and methemoglobinemias; discontinue if cough or shortness of breath
Contra-indications: *see under Co-trimoxazole*; sulfonamide allergy
Interactions: *see Appendix -2*
Side-effects: *see under Pyrimethamine and under Co-trimoxazole (section 1.1.8.)*; pulmonary infiltrates (e.g. eosinophilic or allergic alveolitis) reported

Dose: *oral:* ADULT, pyrimethamine

75 mg with sulfadoxine 1.5 g as a single dose together with, or after, a course of quinine: CHILD, up to 4 years and body-weight over 5 kg, pyrimethamine 12.5 mg with sulfadoxine 250 mg; 5–6 years, pyrimethamine 25 mg with sulfadoxine 500 mg; 7–9 years, pyrimethamine 37.5 mg with sulfadoxine 750 mg; 10–14 years, pyrimethamine 50 mg with sulfadoxine 1 g; 14–18 years, pyrimethamine 75mg with sulfadoxine 1.5g

Proprietary Preparations
Malacide *(Square),* Tab., 500 mg+25 mg, Tk. 4.42/Tab.
Malex *(Ibn Sina),* Tab., 500 mg+25 mg,Tk. 4.10/Tab.
Sulfamin *(Jayson),* Tab., 500 mg+25 mg, Tk. 4.41/Tab.

QUININE[ED]

This is a rapidly acting, highly effective blood schizontocides of all four species of human malaria parasites. The drug is gametocidal against *P. vivax* and *P. ovale* but not against *P. falciparum* and neither active against dormant liver forms of any species. It has a depressant action on the heart, a mild oxytocic effect on the uterus in

pregnancy, a slight blocking action on neuromuscular junction and a weak antipyretic effect. Quinine is rapidly absorbed from gut and distributes widely in the body. Loading dose administration allows achievement of peak levels within a few hours. It is primarily metabolized in liver and excreted in urine.
Indications: first-line drug for treatment of severe, uncomplicated falciparum malaria in an area with documented chloroquine-resistant malaria, with clindamycin first-line therapy for babesial infections; nocturnal leg cramps
Cautions: great cautions required in patients with underlying cardiac abnormalities
(including atrial fibrillation, conduction defects, heart block), elderly, monitor ECG during parenteral treatment; monitor blood glucose and electrolyte during parenteral treatment; G6PD deficiency; renal and hepatic insufficiency require dose adjustment, therapy should be discontinued if signs of cinchonism, hemolysis or hypersensitivity; high doses are teratogenic in *first trimester*; but in malaria benefit of treatment considered to outweighs risk
Contra-indications: visual and auditory problems; hemoglobinuria; myasthenia gravis
Interactions: *see Appendix-2*
Side-effects: cinchonism, including tinnitus, headache, nausea, dizziness, flushing and visual disturbances, abdominal pain, blindness; hypersensitivity reactions including rashes, angioneurotic edema, bronchospasm; hematologic abnormalities like hemolysis particularly in G-6PD deficient patients, leucopenia, agranulocytosis, thrombocytopenia; may cause hypoglycemia, severe hypotension and ECG abnormalities like QT prolongation after rapid IV infusion, rarely black water fever that includes marked hemolysis and hemoglobinuria
Dose: ***treatment of falciparum malaria:*** *oral*: ADULT,600 mg of quinine salt every 8 hours for 5–7 days together with or followed by either doxycycline 200 mg once daily for 7 days *or* clindamycin 450 mg every 8 hours for 7 days; if the parasite is likely to be sensitive, pyrimethamine 75 mg with sulfadoxine 1.5 g as a single dose (instead of either clindamycin or doxycycline) together with, or after, a course of quinine 600 mg every 8 hours for 7 days; CHILD, 10 mg/kg (of quinine salt, max. 600 mg) every 8 hours for 7 days *together with or followed by* Clindamycin 7–13 mg/kg (max. 450 mg) every 8 hours for 7 days *or* in children over 12 years, doxycycline 200 mg once daily for 7 days
or if the parasite is likely to be sensitive, pyrimethamine with sulfadoxine as a single dose: up to 4 years and body-weight over 5 kg, pyrimethamine 12.5 mg with sulfadoxine 250 mg; 5–6 years, pyrimethamine 25 mg with sulfadoxine 500 mg; 7–9 years, pyrimethamine 37.5 mg with sulfadoxine 750 mg; 10–14 years, pyrimethamine 50 mg with sulfadoxine 1 g; 14–18 years, pyrimethamine 75 mg with sulfadoxine 1.5 g; IV quinine 20 mg/kg infuse over 4 hours, then10 mg/kg infuse over 4 hours, every 8-12 hourly followed by oral quinine;
In nocturnal leg cramps: 200–300 mg of quinine salt at bedtime for at least 4 weeks, if improvement, continue

Proprietary Preparations
Albiquin *(Albion),* Tab., 300 mg, Tk. 6.40/Tab.
Aloquin *(Alco),* Tab., 300 mg, Tk.3.40/Tab.
Jasoquin *(Jayson),* Inj., 300 mg/5 ml, Tk. 20.59/Amp. Tab., 300 mg, Tk.6.42/Tab.

1.3.2 ANTIAMEBIC DRUGS

Three morphologically identical but genetically distinct species of Entameba (i.e., *E histolytica, E dispar and E moshkovskii)* have been isolated, although only *E histolytica* is capable of causing amebiasis and requires treatment. The organism may be present in motile, invasive form, or as a cyst. The motile, invasive form causes dysentery associated with invasion of the intestinal wall, and rarely of the liver. The

cornerstone of antiamebic therapy is the **nitroimidazole** compound **metronidazole** or its analogs **tinidazole** and ornidazole. **Paromomycin** (an aminoglycoside antibiotic), **iodoquinol** and **diloxanide furoate** are used in antiamebic therapy as luminal agents to treat asymptomatic cyst passers and to treat patients of amebic colitis or amebic liver abscess for radical cure. **Nitazoxanide**, a drug used in the treatment of cryptosporidiosis and giardiasis, is also effective against *E histolytica.*

DILOXANIDE FUROATE

Diloxanide furoate is an effective luminal amebicide but is not active against tissue trophozoite. In the gut the drug is split into diloxanide and furoic acid. About 10% of diloxanide remains unabsorbed in the gut and exerts amebicidal effect.The absorbed portion is rapidly excreted in urine as glucoronide metabolite.

Indications: as adjunct to metronidazole or tinidazole in amebiasis for radical cure, chronic intestinal amebiasis in which only cyst and non-vegetative forms of E. histolytica are present in the feces

Contra-indications: pregnancy, breast-feeding

Side-effects: flatulence, vomiting, urticaria, pruritus.

Dose: *oral*: ADULT and CHILD 12-18 years, 500 mg every 8 hours for 10 days; CHILD over 25 kg, 20 mg/kg daily in 3 divided doses for 10 days; 1 month–12 years, 6.6 mg/kg 3 times daily for 10 days

Generic Preparation

Tablet, 500 mg,

METRONIDAZOLE[ED]

Metronidazole is effective against tropozoites of *E. histolytica*, *G. lamblia, T. vaginalis,* all anaerobic cocci and both anaerobic gram-negative bacilli, including Bacteroides species, and anaerobic spore-forming gram-positive bacilli. Non-sporulating gram-positive bacilli, aerobic and facultative anaerobic bacteria as well as the cysts of *E. histolytica* are not sensitive. The drug is completely and promptly absorbed after oral intake and with the exception of placenta, penetrates well into body tissues and fluids, including CSF, vaginal secretions, seminal fluids, and saliva and breast milk. It is eliminated in the urine largely as metabolites.

Indications: *see under Dose*

Cautions: disulfiram-like reaction with alcohol, repeated therapy requires leukocyte count before, during and after each course of treatment; pregnancy, lactation; great caution in patients with central nervous system disease, drug should be withdrawn if numbness or paraesthesia of the extremities occur

Contra-indications: first trimester pregnancy

Interactions: *see Appendix-2*

Side-effects: dry mouth, metallic taste, furred tongue, stomatitis, nausea, diarrhea, rashes; headache, dizziness, ataxia, erythema multiforme, darkening of urine, pruritus, urticaria, angioedema, anaphylaxis, abnormal liver function tests, hepatitis, jaundice, thrombocytopenia, aplastic anemia, myalgia, arthralgia, peripheral neuropathy in prolonged treatment, ataxia and transient epileptic seizures with high doses; dysuria, cystitis and a sense of pelvic pressure also have been reported

Dose: *urogenital trichomoniasis*, oral: ADULT 2 g as a single dose or 250 mg thrice daily or 375 mg twice daily for 7 days; CHILD 1-3 years 50 mg every 8 hours; 3-7 years 100 mg twice daily, 7-10 years 100 mg thrice daily; *amebiasis*, oral: ADULT 500-750 mg thrice daily for 10 days; CHILD 35-50 mg/kg/d in three divided doses for 10 days; *giardiasis*, oral: ADULT 250 mg thrice daily for 5 days; CHILD, 15 mg/kg thrice daily for 5 days;

anaerobic infections, IV infusion: ADULT 15 mg/ kg followed 6 hours later by 7.5 mg/kg every 6 hours for 7-10 days; CHILD 7.5 mg/kg every 8 hours; orally, ADULT 800 mg initially then 400-500 mg

every 8 hours; CHILD 7.5 mg/kg every 8 hours; rectally, 1g every 8 hours for 3 days, then 1g every 12 hours for 7-10 days; *leg ulcers and pressure sores*, orally: 400 mg every 8 hours for 7 days; *bacterial vaginosis*, orally: 400-500 mg twice daily for 5-7 days or 2 g as a single dose: *pelvic inflammatory disease*, orally, 400 mg twice daily for 14 days; *acute ulcerative gingivitis*, orally: ADULT 200-250 mg every 8 hours for 3 days; CHILD 1-3 years, 50 mg every 8 hours for 3 days; 3-7 years, 100 mg every 12 hours; 7-10 years, 100 mg every 8 hours; *acute dental infections,* oral: 200 mg every 8 hours for 3-7 days; *Helicobacter pylori eradication*, oral: 400 mg twice/thrice daily;

surgical prophylaxis, oral: 400 mg every 8 hours started 24 hours before surgery, then continued postoperatively by IV infusion or by rectum until oral administration can be resumed; CHILD 7.5 mg/kg every 8 hours; through rectum: 1 g every 8 hours; CHILD 5-10 years, 500 mg every 8 hours; IV infusion: 500 mg shortly before surgery then every 8 hours until oral administration can be started; CHILD 7.5 mg/kg every 8 hours

Proprietary Preparations

Amodis *(Square),* Susp, 200 mg/5 ml, Tk. 24.84/60 ml; Inj.(I.V infusion), 500 mg/100 ml, Tk. 53.40/100 ml; Tab. , 400 mg, Tk. 1.26/Tab.; 500 mg, Tk. 1.35/Tab.
Amotrex *(ACI),* Susp., 200 mg/5 ml, Tk. 29.81/60 ml; Tab. , 200 mg , Tk. 0.69/Tab.; 400 mg, Tk. 1.26/Tab.
Anamet *(Navana),* Tab., 400 mg, Tk. 1.14/ Tab.;Susp., 200 mg/5 ml,Tk.25.50/60 ml
Antipro *(Rangs),* Tab., 400 mg, Tk. 1.14/ Tab.; Suspn., 200mg/5ml, Tk. 25.00/60 ml
Apetryl *(APC),* Tab., 400 mg, Tk. 1.13/Tab.; Susp., 200 mg/5 ml, Tk. 20.00/60 ml
Bendazole *(Maks),* Susp.., 200 mg/5 ml, Tk. 25.70/60 ml;Tab. , 400 mg, Tk. 1.14/Tab.
Benmet *(Pacific),*Tab.,400 mg,Tk.0.86/Tab.
Biozyl *(Biopharma),* Tab. , 400 mg, Tk.1.00/Tab.; Inj.(I.V infusion), 500 mg/100 ml, Tk. 52.59/100 ml ; Susp., 200 mg/5 ml, Tk. 25.09/60 ml
Cedol *(Central),* Tab. , 400 mg, Tk.1/Tab.
Dirozyl *(Acme),* Supp., 500 mg, Tk. 12.05/Supp.;Tab., 200 mg, Tk. 0.67/Tab.;Tab., 400 mg, Tk. 1.26/Tab.;Inj.(I.V infusion), 500 mg/100 ml, Tk. 53.89/100 ml
Dysentrin *(Bios),* Tab. , 400 mg, Tk.1.00/Tab., ;Susp., 200 mg/5 ml, Tk. 22.00/60 ml
Filmet *(Beximco),* Tab. , 200 mg, Tk. 0.69/Tab.;DS Tab. , 800 mg, Tk. 2.01/Tab.;Susp.;200 mg/5 ml, Tk. 25.75/60 ml; Inj.(I.V infusion), 500 mg/100 ml, Tk. 53.88/100 ml ;Tab. , 400 mg, Tk. 1.26/Tab.
Flagyl *(Sanofi),* Tab., 200 mg, Tk. 0.67/Tab.; 400 mg, Tk. 1.26/Tab.; Inj. (IV infusion), 500 mg/100 ml, Tk. 85.22/100 ml ; Susp.. 200 mg/5 ml, Tk. 29.80/60 ml
Flamyd *(Incepta),* Tab. , 200 mg, Tk. 0.87/Tab.**;**, 500 mg , Tk. 1.52/Tab.**;**Gel, 0.75%, Tk. 50.00/30 gm ;Inj.(I.V infusion),, 500 mg/100 ml, Tk. 53.40/100 ml ;Susp., 200 mg/5 ml, Tk. 29.50/60 ml
Florazol *(Nipro JMI),* Tab. , 400 mg, Tk.1.14/ Tab.; Susp., 200 mg/5 ml, Tk.24.94/60 ml
G-Metronidazole *(Gonoshasthaya),* Inj.(I.V infusion),, 500 mg/100 ml, Tk. 48.00/100 ml; Tab. , 400 mg, Tk.1.00/Tab.
Kemet *(Kemiko),* Susp., 200 mg/5 ml, Tk. 25.75/60 ml;Tab. , 400 mg, Tk.1.12/Tab.
Kilpro *(Techno),* Tab. , 400 mg, Tk. 1.14/Tab.;Inj.(I.V infusion), 500 mg/100 ml, Tk. 64.00/100 ml
Klion *(Ambee),* Tab., 200 mg, Tk. 0.67/Tab.; Tab., 400 mg , Tk. 1.09/ Tab; Suspn. , 200 mg/5 ml , Tk. 25.75/60 ml
Librazol *(Libra),* Inj.(I.V infusion), 500 mg/100 ml, Tk. 49.76/100 ml
M-400 *(Pharmasia),*Tab.,400mg, Tk.1.14/Tab.
Mecozol *(Amico),* Susp., 200 mg/5 ml, Tk. 25.00/60 ml ;Tab. , 400 mg, Tk. 1.13/Tab.
Menilet *(Alco),* Tab. , 400 mg, Tk.1.01/Tab.
Menol *(Supreme),* Tab. , 400 mg, Tk. 1.14/ Tab.;Susp., 200 mg/5 ml, Tk. 25.75/60 ml
Metason *(Jayson),* Tab., 400 mg, Tk. 1.15/ Tab.;Susp., 200 mg/5 ml, Tk. 25.10/60 ml
Metco *(Eskayef),*Tab, 400 mg, Tk. 1.14/Tab;Inj.(I.V infusion), 500 mg/100 ml, Tk. 60.00/100 ml **;**Susp., 200 mg/5 ml, Tk. 25.12/60 ml
Metonid *(Popular),* Susp., 200 mg/5 ml, Tk. 25.24/60 ml ;Tab., 400 mg, Tk. 1.14/Tab.;Inj.(I.V infusion), 500 mg/100 ml, Tk. 52.79/100 ml
Metra *(Ad-din),* Tab., 400 mg, Tk. 1.05/Tab.; Suspn., 200mg/5ml, Tk. 24.00/60 ml
Metrion *(General),* Inj.(I.V infusion), 500 mg/100 ml, Tk. 80.00/100 ml; Susp., 200 mg/5 ml, Tk. 25.76/60 ml; Tab., 400 mg, Tk. 1.14/Tab.
Metro *(Opso Saline),* Inj.(I.V infusion), 500 mg/100 ml, Tk. 26.42/100 ml
Metro *(Ziska),* Tab., 400mg, Tk. 0.60/Tab.; Suspn., 200mg/5ml, Tk. 25.00/60ml

Metrobac *(Ziska),* Inj.(I.V infusion), 500 mg/100 ml, Tk. 53.00/100ml
Metron *(Leon),* Tab. , 400 mg, Tk.1.00/Tab.
Metronidazole *(Albion),* Tab. , 400 mg, Tk. 1.06/Tab. ; 200 mg, Tk. 0.67/Tab.
Metropill *(Medimet),* Tab., 200mg, Tk.0.60/Tab.; Tab., 400mg, Tk.1.10/Tab.
Metroson *(Hudson),* Tab., 400mg, Tk.1.05/Tab.
Metryl *(Opsonin),* Tab., 200 mg, Tk. 0.5/Tab.;400 mg, Tk. 0.95/Tab.; 500 mg, Tk. 1.16/Tab.; Inj.(I.V infusion), 500 mg/100 ml, Tk. 40.16/100 ml;Susp., 200 mg/5 ml, Tk. 22.18/60 ml
Metsina *(Ibn Sina),* Tab. , 200 mg, Tk. 0.63/Tab. ;, 400 mg, Tk. 1.15/Tab.;Susp., 200 mg/5 ml, Tk. 25.75/60 ml;Inj.(I.V infusion), 500 mg/100 ml, Tk. 75.00/100 ml
Mez *(Renata),* Inj.(I.V infusion), 500 mg/100 ml, Tk. 70.00/100 ml
Micogyl *(Globe),* Inj.,(I.V infusion), 500 mg/100ml, Tk. 53.41/100 ml; Tab., 400 mg, Tk. 1.00/Tab.
Nida *(Sonear),* Tab., 400 mg, Tk. 0.82/Tab.
Nidazyl *(Orion),* Tab. , 400 mg, Tk. 1.14/Tab.; Inj.(I.V infusion), 500 mg/100 ml, Tk. 52.20/100 ml ;Susp.., 200 mg/5 ml, Tk. 21.08/60 ml
Strazyl *(Asiatic),* Tab. , 400 mg, Tk.1.02/Tab. Tab., 500 mg, Tk. 1.19/Tab.
Varizil *(Drug Int.),* Tab. , 400 mg, Tk. 0.86/Tab.

ORNIDAZOLE

Ornidazole is a 5-nitroimidazole and has therapeutic profile similar to that of metronidazole. It is readily absorbed from GIT and undergoes hepatic metabolism to be eliminated in urine.
Indications: treatment of susceptible protozoal infections and treatment and prophylaxis of anaerobic bacterial infections

Cautions: *see under metronidazole*; also blood dyscrasia; doses should be reduced in patients with severe liver disease

Interactions: *see Appendix-2*

Side-effects: *see under metronidazole*

Dose: *IV infusion: severe amoebic dysentery and amoebic liver abscess*: 0.5 to 1 gm initially, followed by 500mg every 12 hours for 3 to 6 days;

oral: amebiasis: ADULT: 500 mg twice daily for 5-10 days; CHILD : 25 mg/kg daily 500mg as a single dose 5-10 days; *giardiasis*, ADULT:1 or 1.5 g as a single daily dose for 1 or 2 days; CHILD : 500mg as a single dose; *trichomoniasis*, a single dose of 1.5 g or 1 gm together with 500 mg vaginally; 5 day course of 500 mg twice daily are also used, (sexual partners should be treated concomitantly)

Proprietary Preparations
Ornid *(Drug Int.),* Tab., 500 mg, Tk. 7/Tab.
Ornil *(Opsonin),* Tab., 500 mg, Tk. 4.91/Tab.
Ornizol*(Alco),* Tab., 500 mg, Tk. 6.00/Tab.
Robic *(Square),* Tab., 500 mg, Tk. 6.53/Tab.
Troniz *(Unimed),* Tab., 500 mg, Tk. 6.50/Tab.
Xynor *(Beximco),* Tab., 500 mg, Tk. 6.50/Tab.

SECNIDAZOLE

Indications: it is used in the treatment of amebiasis, and has also been tried in giardiasis, and trichomoniasis.

Cautions, Contraindications & Side-effect: *see under Metronidazole*

Dose: *oral*: *giardiasis:* ADULT, single dose of 2g; CHILD, 30mg/kg; *invasive hepatic amebiasis* ADULT, 1.5g single dose or in divided doses for 5 days

Proprietary Preparations
Pronil *(Acme),* Tab., 500 mg, Tk. 8.63/Tab; DS Tab., 1gm, Tk. 16.06/Tab.
Secnidal *(Sanofi),* DS Tab., 1gm, Tk. 25.38/Tab.
Secnizol *(Incepta),* DS Tab., 1 gm, Tk. 16.00/Tab.
Secnid *(Square),* DS Tab.,1 gm, Tk. 16.06/Tab.;Susp .; 500 mg, Tk. 25.10/10 ml
Sezol *(ACI),* DS Tab., 1 gm, Tk. 17.00/Tab.

TINIDAZOLE

Tinidazole is similar to metronidazole and has a longer duration of activity. It is excreted mainly unchanged in urine.

Indications: *see under Dose*

Cautions: *see under Metronidazole*; also avoid breast-feeding during and for 3 days after stopping treatment

Contra-indications: acute porphyria; also *see under Metronidazole*

Interactions: *see Appendix-2*

Side-effects: *see under Metronidazole*
Dose: *oral*: *intestinal amebiasis*: ADULT and CHILD 12-18 years, 2 g daily in a single dose for 3 days, CHILD, 1 month-12 years, 50-60 mg/kg (max. 2 g) once daily for 3 days; *hepatic amebiasis:* ADULT and CHILD 12-18 years, 1.5-2 g once daily for 3-6 days, CHILD, 1 month-12 years, 50–60 mg/kg (max. 2 g) once daily for 5 days; *giardiasis* and *trichomoniasis*, , ADULT and CHILD 12-18 years, 2 g as a single dose (repeat once if required) , CHILD 1 month–12 years single dose of 50–75 mg/kg (max. 2 g) (repeat once if necessary)
anaerobic infections, oral: treatment, 2 g initially then 1 g daily for minimum 5-6 days; prophylaxis 2 g as a single dose; by slow IV infusion: treatment, 800 mg daily, prophylaxis, 1600 mg as a single dose;
bacterial vaginosis and *acute ulcerative gingivitis*, 2 g as a single dose;
abdominal surgery prophylaxis, a single 2 g dose approximately 12 hours before surgery; CHILD 50-60 mg/kg/d.

Proprietary Preparations
Tinizol DS *(Beacon),* Tab. , 1 gm, Tk. 5.70/Tab.
Tinidazole *(Popular),* Inj.,(IV Infusion) 0.40% Tk. 120.00/100 ml
T-Zol *(Popular),* Tab. 1 gm, Tk. 5.73/Tab.; 500 mg, Tk. 2.76/Tab.

1.3.3. DRUGS FOR TRICHOMONIASIS

Trichomoniasis is a sexually transmitted disease (vaginitis in women and uncommonly, urethritis in men) caused by the flagellated proptozoan, Trichomonas vaginalis. Infection with Trichomonas has been associated with an increased risk of acquiring HIV infection. Metronidazole and its analogs remain the drugs of choice for the treatment of trichomoniasis. However, treatment failures due to metronidazole-resistant organisms are becoming more frequent.

1.3.4 ANTIGIARDIAL DRUGS

Giardiasis, caused by the flagellated protozoan Giardia lamblia, can be successfully treated by metronidazole and related nitroimidazoles like tinidazole and scenidazole. Other than these, paromomycin and nitazoxanide are also used for clinical cure.

NITAZOXANIDE

Nitazoxanide is a synthetic broad-spectrum antiparasitic agent and is effective against a number of prorozoans and intestinal helminths. Nitazoxanide and its active metabolite tizoxanide are active against G intestinalis, E histolytica, T vaginalis and against intestinal helminths: Hymenolopis nana, T trichiuria, A lumbricoides, A duodenale, E vermicularis, S stercoralis. Following oral administration, it is rapidly hydrolyzed into active metabolite tizoxanide which excretes out in urine, faces and bile.
Indications: treatment of G intestinalis infections and treatment of diarrhea caused by cryptosporidia

Cautions: pregnancy, breast-feeding; greenish discoloration of urine

Interactions: *see Appendix-2*

Side-effects: GI disturbances: abdominal pain, nausea, vomiting, iarrhea; headache; rarely, fever, malaise, pruritus, dizziness, rhinitis

Dose: *oral*: ADULT, 500 mg twice daily for 3 days; CHILD, 12-47 months, 100 mg twice daily for 3 days; 4-11 years, 200 mg twice daily for 3 days

Proprietary Preparations
Adnix *(Alco),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tab., 500 mg, Tk. 10.00/Tab.
Adonid *(Rephco),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml; Tab. 500 mg, Tk. 10.00/Tab.
Albizox *(Albion),* Susp., 100 mg/ 5 ml, Tk. 50.00/60 ml
Alinix *(Healthcare),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml; Tab. 500 mg, Tk. 10.00/Tab.

Antizoa *(RAK),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tab. 500 mg, Tk. 10.00/Tab.
Atinid *(Biopharma),* Susp., 100 mg/ 5 ml, Tk. 35.13/30 ml; Tk. 50.19/60 ml; Tab. 500 mg, Tk. 10.04/Tab.
Dianide *(General),* Susp., 100 mg/ 5 ml, Tk. 50.19/60 ml; Tk. 35.14/30 ml; Tab. 500 mg, Tk. 10.04/Tab.
Diar *(ACI),* Susp., 100 mg/ 5 ml, Tk. 35.13/30 ml; Tk. 50.19/60 ml; Tab., 500mg, Tk.10.04/Tab.
Nidor *(Pharmasia),* Susp., 100 mg/ 5 ml, Tk. 50.00/60 ml; Tab., 500 mg, Tk. 10.04/Tab.
Nidozox *(Acme),* Susp., 100 mg/ 5 ml, Tk. 40/30 ml; Tab., 500 mg, Tk. 10.04/Tab.
Nitalet *(Amulet),* Tab., 500 mg, Tk. 10.00/Tab.
Nitanid *(Drug Intl),* Susp., 100 mg/ 5 ml, Tk. 50.00/60 ml; Tab., 500 mg, Tk. 10.00/Tab.
Nitasis *(Navana),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml
Nitasol *(Ibn Sina),* Susp., 100 mg/ 5 ml, Tk. 36.00/30 ml; Tk. 50.00/60 ml; Tab., 500 mg, Tk. 11.00/Tab.
Nitax *(Delta),* Tab., 500 mg, Tk. 8.00/Tab.
Nitaxen *(Leon),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; 500 mg, Tk. 10.00/Tab.
Nitaxide *(Beximco),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml; Tab. 500 mg, Tk. 10.00/Tab.
Nitazet *(Organic),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml; Tab., 500 mg, Tk. 10.00/Tab.
Nitazox *(Incepta),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml; Tab., 500 mg, Tk. 10.00/Tab.
Nitide *(Nipro JMI),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml; Tab., 500mg , Tk. 10.00/Tab.
Nitoxin *(Aristo),* Susp., 100 mg/ 5 ml, Tk. 50.00/60 ml; Tk. 36.00/30 ml; Tab., 500 mg, Tk. 10.00/Tab.
Nixar *(Sharif),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tab. 500 mg, Tk. 10.00/Tab.
Nizox *(Somatec),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tab., 500 mg, Tk. 10.03/Tab.
Ntz *(Asiatic),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml
Tazonid *(Popular),* Susp., 100 mg/ 5 ml, Tk. 32.12/30 ml; Tab., 500 mg, Tk. 10.04/Tab.
Toza *(Eskayef),* Susp., 100 mg/ 5 ml, Tk. 35.00/30 ml; Tk. 50.00/60 ml; 500 mg, Tk. 10.00/Tab.
Xanita *(Renata),* Susp., 100 mg/ 5 ml, Tk. 40.00/30 ml; Tk. 58.00/60 ml; Tab., 500 mg, Tk. 10.04/Tab.
Zoana *(Orion),* Susp., 100 mg/ 5 ml, Tk. 35.13/32 ml; Tk. 50.19/62 ml; Tab., 500 mg, Tk. 10.04/Tab.
Zox *(Square),* Susp., 100 mg/ 5 ml, Tk. 35.14/30 ml; Tk. 50.20/60 ml; Tab., 500 mg, Tk. 10.04/Tab.
Zoxan *(Opsonin),* Susp., 100 mg/ 5 ml, Tk. 26.41/30 ml; Tk. 37.74/60 ml; Tab., 500 mg, Tk. 7.55/Tab.
Proxa-A *(Ad-din),* Tab., 500 mg, Tk. 9.00/Tab.; Susp. , 100 mg/5 ml, Tk. 35/30 ml
Xanide *(Globe),* Susp. , 100 mg/5 ml, Tk. 50/60 ml; Tk. 35/30 ml; Tab., 500 mg, Tk. 10/Tab.
Zonan *(MST),* Susp. , 100 mg/5 ml, Tk. 35/30 ml; Tk.50/60 ml ; Tab., 500 mg, Tk. 10/Tab.

1.3.5 DRUGS FOR LEISHMANIASIS

(see section 1.2)

Leishmaniasis is a complex vector-borne zoonosis caused by ~20 different species of obligate intramacrophage protozoa of the genus Leishmania. There are several clinical types of leishmaniasis: a simple skin infection in the form of mucocutaneous ulcers of the mucus membranes which may heal spontaneously; and a visceral form ("kala-azar"). In kala-azar, the parasite spreads through the blood stream and causes hepatomegaly, splenomegaly, anemia and intermittent fever.

The classic therapy for all species of Leishmania is pentavalent antimony (sodium antimony gluconate, sodium stibogluconate). As an alternative, liposomal amphotericin B is a highly effective agent for visceral leishmaniasis and currently drug of choice in antimony-resistant disease. Pentamidine isetionate can be also used in antimony-resistant leishmaniasis. Other drugs include **paromomycin**, parenterally for visceral disease and topical formulation for cutaneous form, and the orally active agent **miltefosine,** both for visceral and cutaneous diseases.

SODIUM STIBOGLUCONATE [ED]

This pentavalent antimonial is effective against cutaneous as well as visceral leishmaniasis (kala-azar). It is rapidly absorbed after parenteral (IM or IV inj.) administration and exhibits two phase-elimination, i.e. with short (about 2 hours) and long (> 24 hours) half-life.
Indications: leishmaniasis

Cautions: renal and hepatic impairment, pregnancy; protein-rich diet should be provided through out treatment period, iron and other nutritional deficiencies and intercurrent infections required to be corrected; monitoring of cardiac, renal and hepatic functions, dose reduction or withdrawal of therapy if any abnormality; IV injections must be given slowly over 5 minutes (to reduce the risk of local thrombosis) and stopped if coughing or substernal pain; treatment of mucocutaneous leishmaniasis may induce severe inflammation around the lesions (may be life-threatening if pharyngeal or tracheal involvement, may require corticosteroid); heart disease (withdraw if conduction disturbance occurs); monitor ECG before and during treatment; predisposition to QT interval prolongation, concomitant use with drugs that prolong the QT interval
Contra-indication: significant renal impairment
Interactions: *see Appendix -2*
Side-effects: anorexia, nausea, vomiting, abdominal pain; ECG changes; headache, lethargy, myalgia; raised liver enzymes; coughing and substernal pain; rarely anaphylaxis; and also reported, fever, sweating, flashing, vertigo, bleeding from nose and gum, jaundice, rash; pain and thrombosis on IV administration, intramuscular injection also painful
Dose: *visceral leishmaniasis*: IM or IV inj. (injection should be filtered immediately before administration using a filter of 5 microns or less), ADULT and CHILD, 20 mg/kg/d for 28 days; *cutaneous leishmaniasis*: except L. aethiopica, *L. braziliensis, L. amazonensis,* by intralesional inj. ADULT and CHILD 100-300 mg into base of lesion, repeated if required, once or twice at intervals of 1-2 days; by IM inj. ADULT and CHILD 10-20 mg/kg daily until a few days after clinical cure and negative slit-skin smear; in cutaneous lesion due to, L. braziliensis and L. amazonensis, dose is 20 mg/kg daily; *mucocutaneous leishmaniasis due to L. braziliensis*: IM inj. ADULT and CHILD 20 mg/kg daily until negative slit-skin smear or for at least 4 weeks; if relapse or unresponsive treatment with pentamidine isetionate or amphotericin B

Generic Preparation
Injection, 100 mg/ml

MILTEFOSIN[ED]

Indications: visceral and cutaneous leishmaniasis,
Cautions: pregnancy and breastfeeding
Side-effects:nausea and vomiting,
Contra-indication: pregnancy
Dose: ADULT- >25kg: 100mg/day, twice a day, for 28days;<25kg: 50mg/day, twice a day, for 28 days.
Proprietary Preparation
Miltefos *(Popular),* Cap., 10 mg, Tk. 60.23/Cap.; 50 mg, Tk. 160.60/Cap.

1.4 ANTIVIRAL DRUGS

Antiviral agents, similar to the antibacterials, are most active when viruses are replicating. An important difficulty in antiviral chemotherapy is that a substantial amount of viral multiplication has often taken place before symptoms appear. Apart from primary infection, viral illness is often the consequence of reactivation of latent virus in the body. In both cases immunocompromised patients suffer severe illness. Antiviral drugs inhibit virus replication in different ways: by directly acting on virus-specific proteins and by modulating host immune system. The first category drugs are: **aciclovir, cidofovir, famciclovir, idoxuridine, valaciclovir, adefovir Dipivoxil, entecavir, telbivudine, tenofovir disoproxil, amantadine, rimantadine, oseltamivir, zanamavir, lamivudine,**

zidovudine, didanosine, zalcitabine, stavudine, ganciclovir, tribavirine. The second category includes **interferons** and **inosine pranobex**. A third category is emerging with the introduction of anti-HIV drug maraviroc that inhibits HIV-replication by blocking a host protein.

1.4.1 DRUGS FOR HERPES VIRUS INFECTIONS

1.4.1.1 DRUGS FOR HERPES SIMPLEX AND VARICELLA-ZOSTER INFECTIONS

Herpes Infection of the mouth, lips and eye is generally associated with herpes virus serotype 1 (HSV-1) and genital infection is most often associated with HSV-2 and also with HSV-1. Mild infection of the eye (ocular herpes) and of the lips (herpes labialis) in immunocompetent individuals is treated with a topical antiviral whereas severe infection, neonatal herpes, infection in immunocompromised individuals, and primary or recurrent genital herpes infection requires administration of systemic antiviral drug. Treatment should start as early as possible and usually within 5 days of the appearance.

Varicella-zoster infection (chicken pox) in healthy children between 1 month and 12 years is usually mild and does not require treatment. Antiviral treatment is recommended in immunocompromised patients and those at special risk of cardiovascular or pulmonary disease or chronic skin disorder. In such cases, an antiviral is given for 10 days with at least 7 days of parenteral treatment. Besides, regardless of immune status and the use of any immunoglobulins, neonates with chicken pox should be treated with a parenteral antiviral. Pregnant women with severe chicken pox are at risk of complications, particularly varicella pneumonia.

Specialist advice should be sought for systematic treatment of herpes simplex and varicella-zoster infection in pregnancy.

ACICLOVIR[ED]

(Acyclovir)

Indications: herpes simplex encephalitis, primary and recurrent genital herpes, herpes simplex skin infections, including initial and recurrent labial and genital herpes (as a cream), disseminated varicella-zoster in immunocompromised patients, neonatal herpes simplex infection

Cautions: maintain adequate hydration; renal impairment requires dose reduction; pregnancy, breast-feeding, the ophthalmic ointment causes a mild transient stinging sensation and a diffuse superficial punctate keratopathy which clears when the drug is stopped

Contra-indications: hypersensitivity
Interactions: *see Appendix-2*

Side-effects: rashes, gastrointestinal disturbances; rises in bilirubin and liver enzymes, increases in blood urea and creatinine, decreases in hematological indices, headache, neurological reactions, dizziness; also confusion, hallucinations, agitation, tremors, somnolence, psychosis, convulsions and coma; extravasation of intravenous infusion fluid may cause severe local inflammation sometimes leading to ulceration

Dose: *by mouth* Herpes simplex *(treatment)* 200 mg (400 mg in the immunocompromised or if absorption is impaired) 5 times daily, usually for 5 days; CHILD under 2 years, half of adult dose, over 2 years, adult dose

Herpes simplex *(prevention or recurrence)* 200mg 4 times daily or 400mg twice daily possibly reduced to 200 mg 2 or 3 times daily and interrupted every 6-12 months

Herpes simplex *(prophylaxis)* in the immunocompromised, 200-400mg 4

times daily; CHILD under 2 years, half of adult dose, over 2 years, adult dose; Varicella and herpes zoster *(treatment)* ADULTS 800mg 5 times daily for 7 days; CHILD 20 mg/kg (max. 800 mg) 4 times daily; 2-5 years 400mg 4 times daily over 6 years, 800 mg 4 times daily

By intravenous infusion (treatment of herpes simplex in the immunocompromised, severe initial genital herpes, and varicella-zoster) 5mg/kg every 8 hours usually for 5 days, doubled to 10 mg/kg every 8 hours in varicella-zoster in the immunocompromised and in simplex encephalitis (usually given for 10 days in encephalitis); prophylaxis of herpes simplex in the immunocompromised, 5mg/kg every 8 hours

NEONATE: up to 3 months, herpes simplex, 10mg/kg every 8 hours usually for ten days; CHILD 3 months-12 years; herpes simplex or varicella-zoster, 250 mg/m^2 every 8 hours usually for 5 days, doubled to 500 mg/m^2 every 8 hours for varicella-zoster in the immunocompromised and in simplex encephalitis (given for 10 days in encephalitis)
(see sec.10.2.3&12.2.3.)

Proprietary Preparations
Acerux *(Opsonin),* Tab., 200 mg, Tk. 10.56/Tab.; 400 mg, Tk.16.54/Tab.; Susp., 200 mg/5ml, Tk. 110.38/70ml.; Inj., (IV Infusion), 250 mg/vial, Tk. 300.75/Vial
Acyvir *(Aristo),* Inj. (IV Infusion) 250mg/Vial, Tk. 300.00/vial; 500mg/Vial, Tk. 600.00/vial
Clovir *(Ibn Sina),* Tab., 200 mg, Tk. 14.00/Tab.; 400 mg, Tk. 22.00/Tab.;
Novirax *(Drug Intl),* Tab., 200 mg, Tk. 14.00/Tab.;
Virux *(Square),* Susp., 200 mg/5 ml, Tk. 125.47/ 70 ml; Tab., 200 mg, Tk. 14.06/Tab.; 400 mg, Tk. 22.08/Tab.
Xovir *(Beacon),* Inj. (IV Infusion), 250 mg/vial, Tk. 400/Tab.; 500 mg/Vial, Tk. 700/Vial
Virunil *(Globe),* Inj. (IV Infusion),, 250 mg/vial, Tk. 400/50 ml

VALACICLOVIR

Indications: *see under acyclovir*; also prevention of cytomegalovirus (CMV) disease following solid organ transplantation when valganciclovir or ganciclovir cannot be used
Cautions, Contra-indications: *see under acyclovir*
Interactions: *see Appendix -2*

Side-effects: *see under acyclovir*; neurological reactions more frequent in high doses

Dose: *oral*: Herpes simplex *(treatment)* 500 mg twice daily for 5 days (1 g twice daily in immunocompromised or HIV patients); CHILD under 2 years, half of adult dose, over 2 years, adult dose

Herpes labialis, treatment, ADULT and CHILD over 12 years, 2 g 12 hourly

Herpes simplex, suppression, 500 mg daily in 1-2 divided doses in immunocompromised or HIV patients, 500mg twice daily; herpes zoster treatment, 1 g three times daily for 7 days
Prevention of CMV disease following solid organ transplantation, 2 g 4 times daily usually for 90 days

Proprietary Preparations
Alaclov *(ACI),* Tab., 500mg , Tk. 40.15/Tab.
Revira *(Square),* Tab., 1 gm, Tk.75.00/Tab., 500 mg , Tk. 40.15/Tab.
Valovir *(Incepta),* Tab., 1 mg, Tk. 75.00/Tab; 500 mg, Tk. 40.00/Tab.

1.4.1.2 DRUGS FOR CYTOMEGALOVIRUS (CMV) INFECTIONS

GANCICLOVIR
(see section 10.2.3)

Indications: life-threatening or sight-threatening CMV infections in immunocompromised patients only; prevention of CMV disease during immunosuppressive therapy following organ transplantation; local treatment of CMV retinitis; congenital cytomegalovirus infection of the CNS
Cautions: history of cytopenia; radiotherapy; ensure adequate hydration during intravenous administration; infuse into vein with adequate flow preferably using plastic cannula; children , renal insufficiency,potential carcinogen and teratogen

Contra-indications: hypersensitivity to valganciclovir, ganciclovir, aciclovir, or valaciclovir; abnormally low hemoglobin, neutrophil, or platelet counts; pregnancy, breast-feeding (until 72 hours after last dose)
Interactions: *see Appendix -2*
Side-effects: leucopenia, thrombocytopenia; GI disturbances, hepatic dysfunction, peripheral neuropathy, depression, anxiety, confusion, anorexia, night sweats; myalgia, arthralgia; macular edema, retinal detachment, vitreous floaters, pruritus,disturbances in hearing and vision, and alopecia
Dose: *IV infusion*: initially 5 mg/kg every 12 hours for 14–21 days for treatment or for 7–14 days for prevention; maintenance (for patients at risk of relapse of retinitis) 6 mg/kg daily on 5 days per week *or* 5 mg/kg daily until adequate recovery of immunity; if retinitis progresses initial induction treatment may be repeated; *Maintenance treatment in AIDS patients* where retinitis stable (following at least 3 weeks of intravenous ganciclovir), *oral:* 1g 3 times daily with food or 500mg 6 times daily with food in renal impairment; CHILD, 1 month–18 years initially (induction) 5 mg/kg every 12 hours for 14–21 days for treatment or for 7–14 days for prevention; maintenance (for patients at risk of relapse of retinitis), 6 mg/kg daily on 5 days per week*or* 5 mg/kg daily until adequate recovery of immunity; if retinitis progresses initial induction treatment may be repeated;
Congenital cytomegalovirus infection of the CNS: *IV infusion*: NEONATE, 6 mg/kg every 12 hours for 6 weeks

Proprietary Preparation
Cymevene [I] *(Roche),* Inj. (IV infusion) 500mg/Vial, Tk. 6,516.70/Vial

1.4.2.1 DRUGS FOR VIRAL HEPATITIS

Use of drugs for treatment and/or prophylaxis of viral heapatitis demands advice of a specialist. The management of acute viral hepatitis is largely symptomatic. Chronic hepatitis is maily due to infections caused by hepatitis B (HVB) and hepatitis C (HCV) viruses and a number of

drugs are available for treating those infections.

Treatment of Chronic hepatitis: In contrast to hepatitis C which is supposed to be curable in all affected individual, hepatitis B is capable of establishing lifelong chronic infection in ~10% of patients. Blood is the main source of infection and spread may follow transfusion of infected blood or blood products or result from injections with contaminated needle (most common among parenteral drug abusers who share needles). Products such as albumin solution and gammaglobulins, which are pasteurized, are wholly free of risk. Patients with chronic HBV may develop active hepatitis that can lead to fibrosis and cirrhosis and all such individuals have a greatly increased incidence of hepatocellular carcinoma.

Interferon (IFN) alone or in combination with ribavirin can cure patients with chronic infection but is associated with high rates of side effects, often leading to premature treatment withdrawal. Drugs like entecavir, adefovir dipivoxil, lamivudine, and telbivudine and tenofovir disoproxil with potent anti-HBV activity are much better tolerated than IFN-containing regimens but are not usually curative. Tenofovir disoproxil or its combination with either emtricitabine or lamivudine may be used with other antiretrovirals in patients who require treatment for both HIV and chronic hepatitis B.

ADEFOVIR DIPIVOXIL

Indication: chronic hepatitis B infection with either compensated liver disease with evidence of viral replication and histologically documented active liver inflammation and fibrosis or decomposed liver disease

Cautions: monitor renal function in every 3 months, more frequently in renal

Impairment and in patient receiving nephrotoxic drugs ; monitor liver function and viral and serological markers for hepatitis B every 6 months; discontinue if deterioration in liver function, hepatic steatosis, progressive hepatomegaly or unexplained lactic acidosis; pregnancy

Contraindication: breast feeding

Side-effects: abdominal pain, nausea, vomiting, dyspepsia, flatulence, diarrhoea, asthenia, headache, renal failure; hypophosphatemia

Dose: ADULT over 18 years, 10mg/day

Proprietary Preparations

Antiva *(Square),* Tab. 10 mg, Tk. 35.14/Tab.
Adfovir *(Sun),* Tab. 10 mg, Tk. 25.10/Tab.
Infovir *(Incepta),* Tab. 10 mg, Tk. 35.00/Tab.

ENTECAVIR

This is a guanosine nucleoside analog with selective toxicity against HBV polymerase.

Indications: treatment of chronic HBV infection with active viral replication and either evidence of persistence elevations in serum aminotransferases or histologically active disease

Caution: monitoring of hepatic function every 3 months and viral and serological markers for HBV infection every 3-6 months during treatment (monitoring continued for at least 1 year after discontinuation), therapy discontinue if detoriation in liver function, hepatic steatosis, progressive hepatomegaly or unexplained lactic acidosis; dose reduction if GFR < 50 ml/min/1.73^2; pregnancy and breast-feeding

Interactions: *see Appendix-2*

Side-effects: headache, fatigue, dizziness, nausea, vomiting, dyspepsia, diarrhea, raised serum amylase and lipase; less commonly, thrombocytopenia, rash, alopecia

Dose: *oral*: adult over 18 years: not previously treated with nucleoside analogue, 500 micrograms once daily, lamivudine-resistant chronic hepatitis B, 1 mg once daily

Proprietary Preparations

Barcavir *(Incepta),* Tab., 0.5 mg, Tk. 48/Tab.; 1 mg, Tk. 90.00/Tab.
Cavir *(Square),* Tab., 0.5 mg, Tk. 48/Tab.; 1 mg , Tk. 90.00/Tab.
Caviral *(Beacon),* Tab., 0.5 mg, Tk. 60/Tab.
Encavir *(Popular),* Tab., 0.5 mg, Tk. 65.25/Tab.; 1 mg Tk. 120.45/Tab.
Entavir *(Drug int.)*Tab., 1 mg, Tk. 90/Tab;. 0.5 mg, Tk. 45.00/Tab.;
Entavir *(Opsonin),* Tab., 1 mg, Tk. 79.47/Tab.; 0.5 mg, Tk. 42.38/Tab.
Enteca *(Renata),* Tab., 0.5 mg, Tk. 48/Tab.
Genevir*(General),*Tab., 0.5 mg,Tk. 48/Tab. Tab. 1 mg, Tk. 90/Tab.
Tecavir *(Aristo),* Tab., 0.5 mg, Tk. 48.00/Tab.; 1 mg, Tk. 90.00/Tab.
Teviral *(ACI),* Tab., 5 mg, Tk. 48.18/Tab.; 1 mg ,Tk. 90/Tab.
Vir *(Acme),* Tab., 0.5 mg, Tk. 48.00/Tab.
Virenta *(Eskayef),* Tab., 0.5 mg, Tk. 48/Tab.

INTERFERONS (IFNs)

IFNs possess antiviral, immunomo-dulatory and antiproliferative activities. Most animal viruses are inhibited by IFNs, although many DNA viruses are relatively insensitive. IFNs alfa-2a and alfa-2b are most effective in patients with high serum transaminase concentrations and active hepatitis on biopsy, who have not acquired infection at birth and those who are HIV-negative. A response to interferon is characterized by an increase in serum aminotransferases after 6-8 weeks of therapy. Great care is necessary, therefore, in treating patients with cirrhosis as liver failure may be induced. Treatment is generally unsuccessful in those infected at birth and in immunodeficient patients.

INTERFERON ALFA

Indications: IFN alfa-2a and alfa 2b: **c**hronic hepatitis B and chronic hepatitis C ideally in combination with ribavirin; chronic myelogenous and hairy cell leukemia, follicular lymphoma, adjunct to surgery in malignant melanoma;
IFN alfa-2a: AIDS-related Kaposi's sarcoma, progressive cutaneous T-cell lymphoma

IFN alfa-2b: lymph or liver metastases of carcinoid tumor, maintenance of remission in multiple myeloma

Cautions: *see notes above*; monitoring of lipid profile

Contra-indications: avoid injections containing benzyl alcohol in neonates

Interactions: *see Appendix-2*

Side-effects: an influenza like syndrome (endogenously produced interferon may cause symptoms in influenza infection), fatigue and depression which disappear on lowering the dose; other effects are anorexia, convulsions, hypotension, hypertension, cardiac dysrhythmias and bone marrow depression; also reported nephrotoxicity, hepatotoxicity and severe hypertriglyceridemia

Dose*: see section 14.2.4***.**

Hepatitis B: IFN-2b, 5-10 mU in ADULT and 6 mU/m^2 in CHILD thrice weekly for 4-6 weeks,Hepatitis C: 3 mU thrice weekly

Proprietary Preparations

see section14.2.4

1.4.2.2 DRUGS FOR INFLUENZA AND RESPIRATORY SYNCYTIAL VIRUS

Over the past several years, there has been increasing concern about the possibility of new influenza pandemics, steaming from severe outbreaks of H5N1 avian influenza and the novel 2009 influenza A H1N1, thought to be of swine origin. Amantadine, rimantadine, oseltamivir and zanamavir are considered to be effective anti-influenza agents. However, these drugs are not a substitute for vaccination, which remains the most effective way of prophylaxis.

AMANTADINE HYDROCHLORIDE

Indications: prevention and treatment of influenza A virus infections, Parkinson's disease

Cautions: renal and hepatic insufficiency, congestive heart failure, confused or hallucinatory states, elderly, gradual withdrawal required in Parkinson's disease

Contra-indications: pregnancy, breast-feeding, epilepsy, gastric ulceration, and severe renal impairment

Side-effects: anorexia, nausea, nervousness, difficulty in concentrating, light headedness, hallucination, dizziness, convulsions, blurred vision, edema

Dose: *oral*: Influenza A, ADULT & CHILD > 10 years, treatment 100 mg daily for 4-5 days; prophylaxis, 100 mg daily usually for 6 weeks or with influenza vaccination for 2-3 weeks after vaccination; Parkinson's disease, 100 mg/d initially then increased after 1 week to 100 mg twice daily (max. 400 mg/d), ELDERLY 100 mg daily

Generic Preparations

Capsule, 100 mg; Syrup, 50 mg/5 ml

OSELTAMIVIR[ED]

Formulated as the prodrug oseltamivir phosphate, after oral administration metabolizes into oseltamivir carboxylate which is selectively effective against influenza virus A and B. Food does not interfere with bioavailability of active drug and reduces the risk of GI intolerance. Because of the need of metabolism into active form, which may not be proper in children particularly in neonates, this drug is not recommended for use under 1 year of age unless there is a pandemic.

Indications: *see under Dose.*

Caution: dose adjustment required in renal insufficiency; pregnancy, breast-feeding; *also see notes above*

Interactions: *see Appendix-2*

Dose: prevention of influenza (should be started within 48 hours of exposure): ADULT and CHILD over 13 years, 75 mg once daily for 10 days for post-exposure prophylaxis and for upto 6 weeks during an endemic;

Treatment of influenza: ADULT and CHILD over 13 years, 75 mg 12 hourly for 5 days

Proprietary Preparations
G-Oseltamivir*(Gonoshasthaya),* Susp, 30 mg/25ml, Tk. 350.00/25 ml; Cap. 75 mg, Tk.75.00/Cap.
Oseflu *(Beximco),* Cap. 75 mg, Tk. 150.00/Tab.
Oselta *(Popular),* Susp.1.2 gm/100 ml, Tk. 642.42/25 ml; Cap. 75 mg, Tk. 150.57/Tab.

RIBAVIRIN

Indications: sever respiratory syncytial virus bronchiolitis in infants and children; in combination with peginterferon alfa or interferon alfa for chronic hepatitis B and C in patients without liver dcompensation and who have fibrosis or high inflammatory activity or for relapse following previous response to interferon alfa

Cautions: specific cautions for inhalation therapy: maintenance of standard supportive respiratory and fluid management; close monitoring of electrolytes and inhalation equipment for drug precipitation; pregnant women (and those planning pregnancy) should avoid exposure to aerosol

Specific cautions for oral therapy: pregnancy be excluded before treatment; effective contraception essential during treatment and for 6 months after treatment in women and in men; routine monthly pregnancy test recommended; condoms must be used if partner of male patient is pregnant (ribavirin excreted in semen); renal impairment; cardiac disease (assessment including ECG recommended before and during treatment, discontinue if deterioration); gout; determine full blood count, platelets, electrolytes, serum creatinine, liver function tests and uric acid before starting treatment and then on weeks 2 and 4 of treatment, then as indicated clinically, adjust dose if adverse reactions or laboratory abnormalities develop

Contra-indications: pregnancy, breast-feeding;

Specific contraindications for oral treatment: Severe cardiac disease, including unstable or uncontrolled cardiac disease in previous 6 months; haemoglobinopathies; severe debilitating medical conditions; severe hepatic dysfunction or decompensated cirrhosis; autoimmune disease (including autoimmune hepatitis); history of severe psychiatric condition

Interactions: *see Appendix -2*

Side-effects: specific for inhalation therapy: Worsening respiration, bacterial pneumonia and pneumothorax reported; rarely non-specific anemia and hemolysis

specific side-effects for oral therapy: hemolytic anemia; also reported (in combination with peginterferon alfa or interferon alfa) nausea, vomiting, dry mouth, stomatitis, glossitis, dyspepsia, abdominal pain, gastritis, peptic ulcer, flatulence, diarrhoea, constipation, pancreatitis, anorexia, weight loss; chest pain, tachycardia, syncope, flushing; dyspnea, cough, rhinitis, pharyngitis, interstitial pneumonitis; sleep disturbances, asthenia, impaired concentration and memory, irritability, aggression, anxiety, depression, dizziness, tremor, hypertonia, myalgia, arthralgia, arthralgia, paraesthesia, peripheral neuropathy, influenza-like symptoms, headache; thyroid disorders, menstrual disturbances, reduced libido, impotence; rash, pruritus, urticaria, photosensitivity, alopecia, dry skin; taste disturbance, eye changes including blurred vision, tinnitus; neutropenia, thrombocytopenia, aplastic anemia, lymphadenopathy, hyperuricemia

Dose: respiratory syncytial virus bronchitis in infants and children: by aerosol inhalation or nebulization of a solution containing 20mg/ml for 12-18 hours for at least 3 days, maximum 7 days; chronic hepatitis C (in combination with interferon alfa or peginterferon alfa): ADULT over 18 years body weight under 75 kg, 400mg in morning and 600mg in the evening; body-weight 75 kg and over, 600mg twice daily

Proprietary Preparation
Celbarin *(Incepta),* Cap. 200 mg,Tk.35/Cap.
Copeg *(Beacon),* Cap. 200 mg, Tk.35.13/Cap.

1.4.4 DRUGS FOR HUMAN IMMUNODEFICIENCY VIRUS (HIV) INFECTION

Currently available drugs provide suppressive therapy for HIV infection rather than a curative one. The goal of therapy is to reduce plasma viral load through suppression of replication as much as possible for as long as possible and expected outcome of initial therapy in a previously untreated patient is an undetectable viral load (plasma HIV RNA <50 copies /ml) within 24 weeks of treatment initiation. **Principles of Antiretroviral therapy (ART):** Analogous to the anti-tuberculosis treatment strategy, current standard of care is to use three drugs simultaneously for the entire duration of treatment, primarily to circumvent the problem of emergence of resistant virus that is seen to be developed with single antiretroviral drug (ARD). Treatment is initiated with 2 nucleoside reverse transcriptase inhibitors (NRTIs) and a non-nucleoside reverse transcriptase inhibitor (NNRTI). Regimens containing 2 NRTIs and a boosted protease inhibitor (PI) are used for patients with resistance to first-line regimens, or with psychiatric illness and in women wishing to become pregnant. Triple drug ART may be switched to a single boosted PI therapy in fully suppressed infection (plasma HIV RNA <50 copies /ml) and in closely monitored highly treatment-adherent patients.
Standard recommendation is to start ART in all those with a CD4 T-lymphocyte count of ≤ 350 cells/ mm^3. However, increasing evidence supports the clinical benefit and cost effectiveness of starting treatment at higher CD4 count (≤ 500 cells/ mm^3).
ART for pregnant women aims to reduce the risk of toxicity to the fetus, to minimize the viral load and disease progression in the mother and to prevent transmission of infection to the neonates.
Prophylactic ART is recommended following exposure to HIV-contaminated material and following potential sexual exposure to HIV.
Patients requiring treatmet for both HIV- and chronic HCV-infection should have therapy with antivirals effective against both viruses.
Cautions: Metabolic effects associated with antiretroviral treatment include fat redistribution, insulin resistance, and dyslipidemia; (collectively termed **lipodystrophy syndrome**); fat redistribution (with loss of subcutaneous fat, increased abdominal fat, 'buffalo hump' and breast enlargement) is associated with regimens containing **protease inhibitors** and **nucleoside reverse transcriptase inhibitors**; the usual risk factors for cardiovascular disease should be taken into account before starting antiretroviral therapy and patients should be advised about lifestyle changes to reduce their cardiovascular risk; plasma lipids and blood glucose should be measured before starting antiretroviral therapy, after 3–6 months of treatment, and then annually; reports of **osteonecrosis** in patients with advanced HIV disease or following long-term exposure to combination ART; improvement in immune function as a result of antiretroviral treatment may provoke a marked inflammatory reaction against residual opportunistic organisms; these reactions may occur within the first few weeks or months of initiating treatment; reports of **autoimmune disorders** (such as Graves' disease) many months after initiation of treatment.

1.4.4.1 NUCLEOSIDE AND NUCLEOTIDE REVERSE TRANSCRIPTASE INHIBITORS

HIV replicates by converting its single-stranded RNA into double-stranded DNA which is incorporated into host DNA. This crucial conversion, the reverse of the normal cellular transcription of nucleic acids, is accomplished by the enzyme reverse transcriptase, inhibition of which results in suppression of viral replication. All but one of the drugs are nucleosides; the sole exception tenofovir is a nucleotide analog. These drugs inhibit both HIV-1, HIV-2 and several have broad-spectrum activity against other viruses: emtricitabine, lamivudine and tenofovir disoproxil are active against HBV and the last one also against herpes viruses.

ABACAVIR[ED]

This reverse transcriptase inhibitor is a guanosine analog with excellent oral bioavailability (>80%) that is independent of food intake. Its elimination involves metabolism by the enzyme alcohol dehydrogenase.

Indications: treatment of HIV-infection in combination with other antiretroviral drugs

Cautions: *see Notes above*; also potentially fatal hypersensitivity syndrome mostly linked with HLA-B*5701 allele; test for that allele before use; counsel patient about how to recognize hypersensitivity and to seek immediate medical attention if symptoms develop ; heavily loaded HIV-infection (> 100 000 copies/ml); patients with chronic hepatic B and C, hepatic impairment, lactic acidosis; patients at high risk of cardiovascular disease; alcoholic patients;

Contraindications: history of hypersensitivity

Interactions: *see Appendix-2*

Side-effects: fatal hypersensitivity characterized by fever, rash, abdominal pain and other GI complaints, cough, phengitis, dyspnea, sore throat, acute respiratory distress syndrome, myalgia, headache, paraesthesia, mouth ulceration, edema, hypotension, renal failure; rarely myolysis

Dose: *oral*: ADULT, 600 mg in 1-2 doses; CHILD, 3 months-12 years, 8 mg/kg 12 hourly adjusted to body weight (max. 600 mg)

Generic Preparations

(Tablet, Abacavir 300 + Lamivudine 150 + Zidovudine 300)

LAMIVUDINE[ED]

Indications: HIV infection in combination with at least two other antiretroviral drugs, chronic hepatitis B infection

Cautions: see Notes above; also pregnancy, breast-feeding, renal and hepatic impairment; monitoring of hepatic function is required, drug should be discontinued if deterioration, hepatic steatosis, hepatomegaly or unexplained lactic acidosis

Contraindications: breast-feeding

Side-effects: tiredness, respiratory tract infections, throat discomfort, headache, abdominal discomfort, nausea, vomiting, diarrhea, hypersensitivity reactions, peripheral neuropathy, lactic acidosis, raised liver enzymes and serum amylase, rarely pancreatitis

Dose: *oral*: HIV infection in combination with other antiretroviral drugs, 150 mg every 12 hours or 300 mg once daily; INFANT < 1 month 2 mg/kg twice daily; CHILD 3 months-12 years 4 mg/kg every 12 hours; max. 300 mg daily; chronic hepatitis B, ADULT 100 mg daily

Proprietary Preparations

Lamivudine

Lamidin *(Eskayef),* Tab. 100 mg, Tk. 25.30/Tab.
Hepavir *(Square),* Tab. 100 mg, Tk. 25.10/Tab.
Lamivir *(Incepta),* Tab. 100 mg, Tk. 25/Tab.
Avilam *(Beximco),* Tab. 100 mg, Tk. 25/Tab.

Lamivudine + Zidovudine
Diavix *(Beximco),* Tab.150 mg + 300 mg, Tk. 45.00/Tab.
Lamivudine + Zidovudine + Nevirapine
Triovix *(Beximco),* Tab.150 mg + 300 mg + 200 mg, Tk. 70.00/Tab.

TENOFOVIR DISOPROXIL[ED]

Indications: HIV infection in combination with other antiretroviral drugs; chronic hepatitis B infection with *either* compensated liver disease *or* decompensated liver disease
Cautions : *see notes above*; also test renal function and serum phosphate before treatment, then every 4 weeks (more frequently if at increased risk of renal impairment) for 1 year and then every 3 months, interrupt treatment if renal function deteriorates or serum phosphate decreases; concomitant or recent use of nephrotoxic drugs; for use in chronic hepatitis B, monitor liver function tests every 3 months and viral markers for hepatitis B every 3–6 months during treatment (continue monitoring for at least 1 year after discontinuation, recurrent hepatitis may occur on discontinuation): If a dose is more than 12 hours late, the missed dose should not be taken and the next dose should be taken at the normal time
Interactions: *see Appendix -2*
Side-effects: *see notes above*; also hypophosphatemia; *rarely* renal failure, proximal renal tubulopathy, nephrogenic diabetes insipidus; reduced bone density
Dose: *oral*: ADULT, over 18 years, 245 mg once daily; CHILD 2–18 years: HIV infection in combination with other ARDs when first-line NRTIs cannot be used because of resistance or contra-indications,
CHILD 2–18 years, 6.5 mg/kg (max. 245 mg) once daily *or* Body-weight 17–22 kg 123 mg once daily body-weight 22–28 kg 163 mg once daily; body-weight 28–35 kg 204 mg once daily; body-weight over 35 kg 245 mg once daily Chronic hepatitis B infection with compensated liver disease (with evidence of viral replication, and histology of active liver inflammation or fibrosis): Child 12–18 years, body-weight > 35 kg 245 mg once daily

Proprietary Preparation
Becovir *(Beacon),* Tab. 300 mg, Tk. 85/Tab.
Foviral *(ACI),* Tab. 300 mg , Tk. 85/Tab.
Proxivir *(Square),* Tab. 300 mg, Tk. 85/Tab.
Tafovir *(Popular),* Tab. 300 mg, Tk. 85/Tab.
Tenoviral *(Opsonin),* Tab. 300 mg, Tk. 63.91/Tab.
Tenvira *(Aristo),* Tab. 300mg, Tk. 85/Tab.
T-Fovir *(Drug Int.),* Tab. 300 mg, Tk.85/Tab.
Vironil *(Unimed),* Tab. 300 mg, Tk. 95/Tab.
Xynovir *(Incepta),* Tab. 300 mg, Tk. 85/Tab.

ZIDOVUDINE[ED]

Indications: HIV infection in combination with other antiretroviral drugs, alone for prevention of maternal-fetal HIV transmission; AIDS or AIDS-related complex, to reduce the frequency of opportunistic infections and for prolonging survival
Cautions: *see under lamivudine*; also hematological disorders, vitamin B12 deficiency; associated with higher risk of lipoatrophy
Contra-indications: abnormally low neutrophil counts or hemoglobin concentration, neonates with hyperbilirubinemia requiring treatment other than phototherapy, or with raised transaminase
Interactions*: seeAppendix-2*
Side-effects: anemia, leucopenia, neutropenia, nausea, vomiting, abdominal discomfort, diarrhea, taste disturbance, pancreatitis, liver disorders including fatty change and raised bilirubin and liver enzyme, chest pain, dyspnea, cough, influenza-like symptoms, headache, fever, neuropathy, convulsions, dizziness, anxiety, depression, asthenia, myopathy, pancytopenia, thrombocytopenia, hypersensitivity reactions, pigmentation of nails, skin and mucosa
Dose: *oral*: ADULT 500-600 mg daily in 2-3 divided doses; INFANT < 4 weeks 4 mg/kg twice daily; CHILD > 3 months 180-360 mg/m2 daily in 3-4 divided doses; max. 200 mg every 6 hours; patients temporarily unable to take zidovudine by mouth, by IV infusion over

1 hour 1-2 mg/kg every 4 hours (approximating to 1.5-3 mg/kg every 4 hours by mouth) usually for not more than 2 weeks; CHILD 80-160 mg/m2 every 6 hours (120 mg/m2 every 6 hours approximates to 180 mg/m2 every 6 hours by mouth); prevention of maternal-fetal HIV transmission, oral, between 14 and 34 weeks of gestation, 100 mg 5 times daily, IV during labor, 2 mg/kg over 1 hour, then 1 mg/kg/h by continuous infusion, followed by syrup to neonate from birth through 6 weeks of age, 2 mg/kg every 6 hours

Proprietary Preparation
(For co-formulation with abacavir and lamivudine see under abacavir and that with lamivudine see under lamivudine)

ZALCITABINE

Indications: advanced HIV infection in combination with other antiretroviral drugs
Cautions: *see notes above;* also peripheral neuropathy *(see below);* pancreatitis (monitor serum amylase in those with history of elevated serum amylase); cardiomyopathy, history of congestive cardiac failure; hepatotoxicity (potentially life threatening lactic acidosis with hepatomegaly reported); pregnancy (women of childbearing age should use effective contraception during treatment); renal impairment

PERIPHERAL NEUROPATHY: discontinue immediately if peripheral neuropathy develops characterized by numbness and burning dysaesthesia possibly followed by sharp shooting pains or severe continuous burning and potentially irreversible pain; extreme caution and close monitoring required in those at risk of peripheral neuropathy (especially those with low CD4 cell count for whom risk is greater)

PANCREATITIS: discontinue permanently if clinical pancreatitis develops; suspend if raised serum amylase associated with glucose intolerance rising triglyceride, decreasing serum calcium or other signs of impending pancreatitis until pancreatitis excluded

Contraindications: peripheral neuropathy; breast-feeding

Interactions: *see Appendix-2*

Side-effects: peripheral neuropathy (discontinue immediately); oral ulcers, nausea, vomiting, dysphagia, anorexia, diarrhoea, abdominal pain, constipation; pharyngitis; headache, dizziness; myalgia, arthralgia; rash, pruritus, sweating, weight loss, fatigue, fever, rigors, chest pain, anemia, leucopenia, neutropenia, thrombocytopenia, disorders of liver function; less frequently pancreatitis, esophageal ulcers (suspend treatment if no response to treatment for specific organisms), jaundice and hepatocellular damage; other less frequent side-effects include taste disturbances, tachycardia, cardiomyopathy, asthenia, tremor, movement disorders, mood changes, hearing and visual disturbances, hyperuricemia and renal disorders

Dose: 750 micrograms 3 times daily; ELDERLY and CHILD under 13 years, not recommended (safety and efficacy not established)

Generic Preparation
Tablet, 75 micrograms; 750 microgarms

1.4.4.2 NON-NUCLEOSIDE REVERSE TRANSCRIPTASE INHIBITORS

EFAVIRENZ[ED]

Indications: HIV infection in combination with other antiretroviral drugs
Cautions: see notes above; also hepatic impairment; severe renal impairment; pregnancy and breast-feeding; elderly; history of mental illness or substance abuse; patient on other hepatotoxic drug needs monitoring of liver function; discontinue if severe rash with blistering, desquamation, mucosal involvement or fever;

Contra-indications: porphyria, pregnancy
Interactions : *see Appendix-2*
Side-effects: rash, usually in the first 2 weeks,; Stevens-Johnson syndrome; headache, dizziness, insomnia, abnormal dreams, fatigue, impaired concentration (administration at bed time in the first 2-4 weeks reduces CNS effects); nausea, less frequently vomiting, diarrhea, hepatitis, depression, anxiety, psychosis, amnesia, ataxia, stupor, vertigo, also reported raised serum cholesterol, elevated liver enzymes (especially if seropositive for hepatitis B and C), pancreatitis
Dose: *oral*: HIV infection in combination with other antiretroviral drugs, ADULT 600 mg once daily; CHILD, 3-18 years: body weight 13-15 kg 200 mg once daily; body weight 15-20 kg 250 mg once daily; body weight 20-25 kg 300 mg once daily; body weight 25-32 kg 350 mg once daily; body weight 33-40 kg 400 mg once daily; body weight 40 kg and over adult dose

Proprietary Preparation
Avifanz *(Beximco),* Tab. 600 mg, Tk. 200/Tab.

NEVIRAPINE [ED

Indications: HIV infection in combination with other antiretroviral drugs; prevention of maternal-fetal HIV transmission
Cautions: *see notes above*; also hepatic impairment (chronic hepatitis B or C); severe renal impairment; pregnancy and breast-feeding; high CD4 cell count;
close liver function monitoring required during first 18 weeks; monitor before treatment then every 2 weeks for 2 months then after 1 month and then regularly; monitor closely for skin reactions during first 18 weeks discontinue permanently if abnormalities in liver function tests accompanied by hypersensitivity reaction; Counseling: patients should be told how to recognize hypersensitivity reactions and advised to discontinue treatment and seek immediate medical attention if severe skin reaction, hypersensitivity reactions, or symptoms of hepatitis develop
Contra-indications: acute porphyria; post-exposure prophylaxis
Interactions: *see Appendix-2*
Side-effects: rash including Stevens-Johnson syndrome and rarely, toxic epidermal necrolysis; hepatitis and jaundice reported; nausea, vomiting, abdominal pain, diarrhea, headache, drowsiness, fatigue, fever; hypersensitivity reactions (may involve hepatic reactions and rash) anaphylaxis, angioedema, urticaria, also reported
Dose: *oral*: HIV infection in combination with other antiretroviral drugs, ADULT, 200 mg once daily of 'immediate-release' preparation for first 14 days then (if no rash present) 200 mg twice daily of 'immediate-release' preparation or 400 mg once daily of modified-release preparation; CHILD, 1 month–3 years 150–200 mg/m^2 (max. 200 mg) once daily of 'immediate-release' preparation for first 14 days, then (if no rash present) 150–200 mg/m^2 (max. 200 mg) twice daily *or* 300–400 mg/m^2 (max. 400 mg) once daily of 'immediate-release' preparation; 3–18 years 150–200 mg/m^2 (max. 200 mg) once daily of 'immediate-release' preparation for first 14 days, *then* (if no rash present after initial dose titration)150–200 mg/m^2 (max. 200 mg) twice daily of 'immediate-release' preparation *prevention of maternal-fetal HIV transmission,* 200 mg orally as a single dose to the woman at onset of labor followed by a 2 mg/kg oral dose to the neonate within 3 days after delivery
***Note*:** Initial dose titration using 'immediate-release' preparation should not exceed 28 days; if rash not resolved within 28 days, alternative treatment should be sought; If a dose is more than 8 hours late with the 'immediate-release' preparation (or more than 12 hours late with the modified-release preparation), the missed dose should not be taken and the next dose should be taken at the usual time

Proprietary Preparation
(*For co-formulation with lamivudine and zidovudine see under lamivudine)*

1.4.4.3 PROTEASE INHIBITORS

These drugs prevent proteolytic cleavage of HIV precursor polypeptides that includes essential structural and enzymatic (reverse transcriptase, protease, integrase) components of the virus resulting in prevention of metamorphosis of the virus particles into their mature infectious form. These drugs have broadly similar therapeutic effects and include atazanavir, darunavir, indinavir, nelfinavir, ritronavir, saquinavir, lopinavir etc. Dyslipidemia is associated with antiretroviral treatment, particularly with protease inhibitors. Protease inhibitors (and some nucleoside reverse transcriptase inhibitors) are associated with insulin resistance and hyperglycemia of the protease inhibitors, atazanavir and darunavir may be less likely to cause dyslipidemia, while saquinavir and atazanavir may be less likely to impair glucose tolerance

Cautions: associated with hyperglycaemia and insulin resistance, should be used with caution in diabetes, in patients with hemophilia who may be at increased risk of bleeding, and

Contra-indications: acute porphyria, hepatic impairment, in patients with chronic hepatitis B or C (increased risk of hepatic side-effects)

Side-effects: include GI disturbances (including diarrhea, nausea, vomiting, abdominal pain, flatulence), anorexia, hepatic dysfunction, pancreatitis; blood disorders including anemia, neutropenia, and thrombocytopenia; sleep disturbances, fatigue, headache, dizziness, paraesthesia, myalgia, myositis, rhabdomyolysis; taste disturbances; rash, pruritus, Stevens-Johnson syndrome, hypersensitivity reactions including anaphylaxis; see also Notes above for lipodystrophy and metabolic effects and osteonecrosis.

INDINAVIR[ED]

Indications: HIV infection in combination with nucleoside reverse transcriptase inhibitors and usually with low-dose ritonavir

Cautions: *see notes above*; also hepatic impairment; adequate hydration, at least 2 L daily to reduce risk of nephrolithiasis (more frequent in children; may require interruption or discontinuation) ; solubility decreases at higher p^H, antacids or other buffering agents should not be taken at the same time; hemophilia; pregnancy and breast-feeding; metabolism of many drugs inhibited if administered concomitantly

Interactions: *see Appendix-2*

Side-effects: nausea, vomiting, diarrhea, abdominal discomfort, dyspepsia, flatulence pancreatitis, dry mouth, taste disturbances; headache, dizziness, insomnia; myalgia, myositis, rhabdomyolysis, asthenia, paraesthesia; hyperglycemia: anaphylactoid reactions, rash (including Stevens-Johnson syndrome), pruritus, dry skin, hyperpigmentation, alopecia, paronychia; interstitial nephritis, nephrolithiasis, dysuria, hematuria, crystalluria, proteinuria, pyuria (in children), hepatitis, transient hyperbilirubinemia; blood disorders including neutropenia, hemolytic anemia; lipodystrophy

Dose: *oral*: HIV infection, in combination with two NRTIs and low-dose ritonavir booster, ADULT, indinavir 800 mg and ritonavir 100 mg both twice daily; in combination with two NRTIs but without ritonavir booster ADULT, 800 mg every 8 hours; CHILD & ADOLESCENT 4-17 years 500 mg/m^2 every 8 hours (maximum 800 mg every 8 hours); CHILD < 4 years safety and efficacy not established

Generic Preparation

Capsule, 200 mg,

NELFINAVIR[ED]

Indications: HIV infection in combination with other antiretroviral drugs

Cautions: *see notes above*; also hepatic and renal impairment, diabetes mellitus,

hemophilia, pregnancy and breast-feeding
Interactions: *see Appendix -2*
Side-effects: diarrhea, nausea, vomiting, flatulence, abdominal pain; rash; reports of elevated creatinine kinase, hepatitis and pancreatitis, neutropenia, hypersensitivity reactions including bronchospasm, fever, pruritus and facial edema, lipodystrophy and metabolic effects
Dose : *oral:* HIV infection in combination with other antiretroviral drugs, ADULT 1.25 g twice daily or 750 mg 3 times daily; CHILD, 3-13 years, initially 50-55mg/kg twice daily (max 1.25g twice daily) or 25-30mg/kg 3 times daily (max.750 mg 3 times daily)

Proprietary Preparation
Avifix *(Beximco),* Tab. 250 mg, Tk. 45.00/Tab

SAQUINAVIR[ED]

Indications: HIV infection in combination with other antiretroviral drugs and usually with low-dose ritonavir
Cautions: *see notes above;* also monitor ECG before starting treatment and then on day 3 or 4 of treatment, discontinue if QT interval over 480 milliseconds, if QT interval more than 20 milliseconds above baseline, or if prolongation of PR interval, patients should be told how to recognize signs of arrhythmia and advised to seek medical attention if symptoms such as palpitation or syncope develop; concomitant use of garlic reduces plasma concentration; hepatic and renal impairment; diabetes mellitus; hemophilia; pregnancy and breast-feeding;
Contra-indications: severe hepatic impairment; predisposition to cardiac arrhythmias (including congenital QT prolongation, bradycardia, history of symptomatic arrhythmias, heart failure with reduced left ventricular ejection fraction, electrolyte disturbances, concomitant use of drugs that prolong QT or PR interval);
Interactions*: see Appendix-2*
Side-effects: *see notes above;* also diarrhea, buccal and mucosal ulceration, abdominal discomfort, nausea, vomiting, headache, peripheral neuropathy, paraesthesia, dizziness, insomnia, mood changes, ataxia, musculoskeletal pain, asthenia; fever, pruritus, rash and other skin eruptions, rarely Stevens-Johnson syndrome; other rare adverse effects include thrombocytopenia and blood disorders, seizures, liver damage, pancreatitis and nephrolithiasis, elevated creatinine kinase, raised liver enzymes and neutropenia, when used in combination therapy, lipodystrophy and metabolic effects
Dose: *oral:* HIV infection in combination with nucleoside reverse transcriptase inhibitors and with low-dose ritonavir booster, ADULT, previously treated with ART, saquinavir 1 g and ritonavir 100 mg both twice daily and not previously treated with ART, 500 mg 12 hourly for 7 days then 1 g 12 hourly ; without ritonavir booster, ADULT 1.2 g every 8 hours after meal; CHILD < 16 years safety and efficacy not established

Generic Preparation
Tablet, 500 mg

1.4.4.4 INTEGRASE INHIBITORS

HIV-retrovirus DNA remains in the host cell nucleus for a prolonged period of inactivity or latency because of its ability of chromosomal integration through activity of the viral integrase enzyme. Raltegravir inhibits this enzyme and prevents the formation of covalent bonds between host and virus DNA.

RALTEGRAVIR

Indications: HIV infection in combination with other antiretroviral drugs
Cautions: myopathy or rhabdomyolysis; chronic hepatitis B or C; psychiatric illness; discontinue if severe rash or rash with fever, malaise, arthralgia, myalgia, blistering, mouth ulceration, conjunctivitis, angioedema, hepatitis, or eosinophilia; severe hepatic impairment, pregnancy, breast-feeding
Interactions: *see Appendix -2*

Side-effects: GI disturbances, abdominal pain, flatulence, hypertriglyceridemia, dizziness, headache, depression, insomnia, abnormal dreams, hyperactivity, asthenia, rash (including Stevens-Johnson syndrome); *less commonly,* gastritis, hepatitis, pancreatitis, dry mouth, taste disturbances, pain on swallowing, peptic ulcer, constipation, rectal bleeding, lipodystrophy, palpitation, ventricular extrasystoles, bradycardia, hypertension, flushing, chest pain, edema, dysphonia, epistaxis, nasal congestion, drowsiness, anxiety, appetite changes, confusion, impaired memory and attention, suicidal ideation, pyrexia, chills, carpal tunnel syndrome, tremor, peripheral neuropathy, erectile dysfunction, gynaecomastia, menopausal symptoms, osteopenia, renal failure, nocturia, polydipsia, anemia, thrombocytopenia, neutropenia, arthralgia, myalgia, rhabdomyolysis, visual disturbances, tinnitus, gingivitis, glossitis, acne, pruritus, hyperhidrosis, dry skin, skin papilloma, alopecia;
Dose: *oral*: ADULT, 400 mg twice daily; CHILD, 2–18 years:(in combination with other antiretroviral drugs for HIV infection resistant to multiple antiretrovirals): body-weight 12–14 kg 75 mg twice daily; body-weight 14–20 kg 100 mg twice daily; body-weight 20–28 kg 150 mg twice daily; body-weight 28–40 kg 200 mg twice daily; body-weight over 40 kg 300 mg twice daily

Generic Preparation
Tablet, 400 mg

1.4.4.5 ENTRY INHIBITORS

Entry inhibitor drugs prevent entry into host cell of the retrovirus in two different ways: inhibiting fusion of viral cell membranes mediated by gp41 and CD4 interactions (enfuvirtide) and blocking host cell CCR5 receptor to block binding of viral gp 120 (maraviroc).

ENFUVIRTIDE

Indications: HIV infection in combination with other antiretroviral drugs for resistant infection or for patients intolerant to other antiretroviral regimens
Cautions: discontinue immediately if any signs or symptoms of systemic hypersensitivity develop and do not rechallenge; patients should be told how to recognize signs of hypersensitivity, and advised to discontinue treatment and seek immediate medical attention if symptoms develop; hepatic impairment, chronic hepatitis B or C; pregnancy and breast-feeding
Interactions: *see Appendix -2*
Side-effects injection-site reactions; pancreatitis, gastro-esophageal reflux disease, anorexia, weight loss; hypertriglyceridemia; peripheral neuropathy, asthenia, tremor, anxiety, nightmares, impaired concentration, vertigo; pneumonia, sinusitis, influenza-like illness; diabetes mellitus; hematuria; renal calculi, lymphadenopathy; myalgia; conjunctivitis; dry skin, acne, erythema, skin papilloma; *less commonly* hypersensitivity reactions, including rash, fever, nausea, vomiting, chills, rigors, low blood pressure, respiratory distress, glomerulonephritis, and raised liver enzymes reported;
Dose: *subcutaneous injection*: reconstitute with 1.1 mL water for Injections and allow to stand (for up to 45 minutes) to dissolve; do **not** shake or invert vial;
ADULT, 90 mg twice daily; CHILD, 6–16 years 2 mg/kg (max. 90 mg) twice daily, 16–18 years 90 mg twice daily

GenericPreparation
Injection, 90 mg/ml

MARAVIROC

Indications: HIV infected adults in combination with other antiretroviral drugs previously treated with antiretrovirals who have base line evidence of predominantly CCR5-tropic virus

Cautions: cardiovascular disease; hepatic impairment, chronic hepatitis B or C; pregnancy, breast-feeding
Interactions: *see Appendix -2*
Side-effects: GI disturbances; depression, insomnia, malaise, headache, anemia, rash; *less commonly,* seizures, renal failure, proteinuria, myositis; *rarely* hepatitis, angina, pancytopenia, granulocytopenia, Stevens-Johnson syndrome, toxic epidermal necrolysis; also reported hypersensitivity reactions including rash, fever, eosinophilia, and hepatic reactions;
Dose: oral: ADULT, over 18 years, 300 mg twice daily

Generic Preparation
Tablet, 150 mg,

1.5 ANTHELMINTICS

Anthelmintic are drugs that act either locally within the gut to cause expulsion of worms from GI tract, or systemically against helminths residing outside GI tract. Worms pathogenic for humans can be classified into roundworms (nematodes) and two types of flatworms, flukes (trematodes) and tapeworms (cestodes). Though helminths have complex life-cycles, drug resistance has not yet proved to be a clinical problem, but it is in animals on continuous chemoprophylaxis. The use of drugs in helminthiasis needs to be combined with personal hygienic measures to break the cycle of autoinfection or re-infection. Social and educational measures and interventions are highly important for the success of any large scale anthelminthic program. The commonest parasites encountered in Bangladesh are: roundworms, hookworms, thread worms, strongyloides, tapeworms and filarial worms.

1.5.1 DRUGS FOR NEMATODE INFECTIONS

Major nematode parasites of humans include the soil-transmitted helminthes (STHs, referred sometimes as “geohelminths”) and the filarial nematodes. As STH worm burdens are higher in school-aged children than in any other single group, school-based administration of broad-spectrum anthelmintics on a periodic and frequent basis is practiced in many developing countries including Bangladesh. The prevalent STH infections in our country are ascariasis (roundworm), trichiuriasis (whipworm), and hookworm infection. The drugs most widely employed for reducing morbidity are the benzimidazole anthelmintics, either albendazole or mebendazole.

1.5.1.1 ASCARICIDES: DRUGS FOR COMMON ROUNDWORMS

The preferred agents are the benzimidazoles, mebendazole and albendazole and the board-spectrum drug pyrantel pamoate. Levamisol is an alternate choice.

1.5.1.2 DRUGS FOR HOOKWORMS (ANCYLOSTOMIASIS, NECATORIASIS)

Hookworms (Ancylostomiasis) are located in the upper small intestine and suck blood from their point of attachment; anemia may thereby be produced. Effective treatment needs not only expulsion of the worms but treatment of the anemia. Albendazole is the drug of first choice against both species and mebendazole is the next. Dog and cat hookworm larvae may enter human skin where they produce slowly extending itching tracks usually on the foot (cutaneous larva migrans or creeping eruption). Single tracks can be treated with topical thiabendazole and multiple infections respond to oral ivermectin, albendazole or thiabendazole

1.5.1.3 DRUGS FOR THREADWORMS/ PINWORMS

The adult threadworms do not live for longer than 6 weeks. Adult female worms lay ova on the perianal skin which causes pruritus; scratching the area then leads to ova being transmitted on fingers to the mouth, often via food eaten with unwashed hands. Pruritus in the perianal, perineal region can be severe, scratching may cause secondary infection. Mebendazole is the drug of choice. Albendazole and pyrantel pamoate also are highly effective.

1.5.1.4 DRUGS FOR DWARF THREAD-WORMS (STRONGYLOIDIASIS)

Strongyloides stercoralis also called Drawf threadworm is capable to complete its life-cycle within human host. It lives in the gut and produce larvae, which penetrate the gut wall and invade the tissues, setting up a cycle of auto-infection. Ivermectin is the treatment of choice for chronic *Strongyloides* infection. Albendazole is an alternative.

1.5.1.5 DRUGS FOR WHIPWORMS (TRICHURIASIS)

Although rarely causes serious complication heavy Trichuris burdens in children can lead to colitis, dysentery syndrome and rectal prolapse. Mebendazole and albendazole are the most effective drugs.

ALBENDAZOLE[ED]

Albendazole, a broad-spectrum benzimidazole carbamate has antihelminthic activity similar to that of mebendazole (see also under mebendazole) and is more effective against strongyloidiasis, cystic hydatid disease caused by Echinococcus granulosus and neurocysticercosis caused by larval forms of Taenia solium. Certain microsporidial species that cause intestinal infections in AIDS patients respond partially or completely. The drug also has some efficacy against anaerobic protozoa such as Trichomonus vaginalis and Giardia lamblia

Indications: *see under Dose*

Cautions: liver disease; monitoring of liver function and for bone marrow toxicities required in prolong use; in neurocysticercosis sought neurologist / neurosurgeon advice

Contra-indications: pregnancy

Interactions: *see Appendix-2*

Side-effects: gastrointestinal disturbances, headache, dizziness, changes in liver enzymes

Dose: *oral*: *roundworm & hookworm infections:* ADULT & CHILD > 2 years 400 mg as a single dose; *threadworm infections* 400 mg as a single dose for 3 days, repeated after 3 weeks if necessary; *echinococcus granulosus (cystic hydatid disease): adjunct in surgical treatment*: *pre-surgery*, 800 mg daily in divided doses for 28 days followed by 14 tablet-free days, cycle repeated once before surgery; *post-surgery*, 800 mg daily in divided doses for 28 days followed by 14 tablet-free days, cycle repeated once; as *primary*

treatment in inoperable cases, ADULT > 60 kg, 800 mg daily in divided doses for 28 days followed by 14 tablet-free days, may be given up to 3 cycles; for *alveolar echinococcosis caused by E multilocularis*, above drug treatment needs to be continued for months or years; *neurocysticercosis* , ADULT > 60 kg 800 mg daily in 2 divided doses for 8-30 days, ADULT < 60 kg 15 mg/kg, max. 800 mg/d in 2 divided doses for 8-30 days; *cutaneous larva migrans,* 400 mg as a single dose; *intestinal capillariasis,* 200-400 mg twice daily for 10 days; *trichinosis,* 200-400 mg twice daily for 15 days; *Strongyloides stercoralis,* as an alternative to ivermectin, 400 mg twice daily for 3 days, repeated after 3 weeks if necessary

Proprietary Preparations

Abentel *(Aristo),* Tab. 400 mg, Tk 5.00/Tab.
Adze *(Kemiko),* Tab. 400 mg, Tk. 4.00/Tab.
Ah *(Drug Intl),* Susp., 200mg/5ml, Tk.15/10 ml; Tab. 400 mg, Tk. 3.50/Tab.
Alba *(Navana),*Tab. 400 mg, Tk. 4/Tab.
Albamax DS *(Ziska),* Tab., 400 mg, Tk. 3.80/Tab.
Albazole DS *(Central),*Tab. 400 mg,Tk. 4/Tab.
Alben *(Eskayef),* Susp. 200mg/5ml, Tk. 20/10 ml; Tab. 400 mg, Tk. 5.00/Tab.
Albendazole *(Albion),* Susp., 200 mg/5ml, Tk. 15.00/5 ml; Tab. 400 mg, Tk. 4.00/Tab.
Albendol *(Globex),* Tab. 400 mg , Tk. 3.50/Tab.
Albrex *(Medimet),* Tab., 400 mg, Tk.3.50/Tab.
Alda DS *(Supreme),* Tab. 400mg, Tk. 3.50/Tab.; Susp. 200 mg/5ml, Tk. 15/10ml
Alentin DS *(Renata),* Tab. 400 mg, Tk. 3.35/Tab.
Aldaben *(Ad-din),* Susp., 200mg/5ml, Tk. 15.00/10ml; DS Tab., 400mg, Tk. 4.00/Tab.
Al-DS *(Globe),* Tab., 400 mg , Tk. 3.80/Tab.
Almex 400 *(Square),* Tab. 400 mg, Tk. 5.00/Tab.; Susp., 200 mg/5 ml, Tk. 18/10 ml
Alphin DS *(Beximco),* Tab. 400 mg, Tk.5/Tab.
Alzed *(General),* Tab. 400 mg, Tk. 3.31/Tab.
Alzen *(Sonear),* Tab. 400 mg, Tk. 3.90/Tab.
Anbendazole *(Popular),* Tab. 400mg, Tk. 4.01/Tab.
Asiben *(Asiatic),* Susp., Tk. 14/10 ml; Tab. 400 mg, Tk. 3.80/Tab.
Azole *(Biopharma),* Susp., 200mg/5ml, Tk. 18/10 ml; Tab. 400 mg, Tk. 5/Tab.
Ben-A *(Acme),* Susp., 200mg/5ml, Tk. 20.00/10 ml; Tab. 400 mg, Tk. 5/Tab.
Chuben *(Alco),* Tab. 400 mg, Tk. 3.85/Tab.
Elmin *(Jayson),* Tab. 400 mg, Tk. 3.31/Tab.
Estazol *(Ibn Sina),* Tab. 400 mg, Tk. 4/Tab.; Susp., 200mg/5 ml, Tk. 20/10 ml
Exworm *(Leon),* Susp., 200mg/5ml , Tk. 15.00/10ml;Tab. 400 mg, Tk. 4.00/Tab.
G-Albendazole *(Gonoshasthaya),* Tab. 400 mg, Tk. 3.25/Tab.
H-ben *(Hudson),* Tab., 400mg, Tk.3.60/Tab.
Luban-DS *(Rephco),* Tab. 400mg, Tk. 3.30/Tab.
Makzol *(Maks),* Tab. 400 mg, Tk. 4.00/Tab.
Nematox DS *(Chemist),* Tab. , 400 mg, Tk. 3.54/Tab.
Nt-par *(Rangs),* Suspn., 200 mg / 5 ml, Tk. 15.00/10 ml ; Tab., 400mg, Tk. 4.00/Tab.
Q ben DS *(Concord),*Tab. 400 mg, Tk. 4/Tab.
Sintel *(ACI),*Susp., 200mg/5ml, Tk. 20/10ml; Tab. 400mg, Tk. 5.00/Tab.
Triben *(Ambee),* Susp., 200 mg / 5 ml , Tk. 13.97/10ml; Tab., 400 mg , Tk. 3.35 /Tab
Verben *(Astra),*Tab. 400 mg, Tk.4.00/Tab.
Vermid *(Somatec),* Tab. 400 mg, Tk. 5/Tab.
Vermikil *(Nipro JMI),* Susp., 200mg/5ml , Tk. 15.06/10 ml; Tab. 400 mg, Tk. 3.52/Tab.
Zoben *(Amico),* Susp., 200mg/5ml, Tk. 14.00/10ml; Tab. 400 mg, Tk. 3.00/Tab.

LEVAMISOLE[ED]

Indications: ascariasis, hookworm and mixed ascariasis with hookworm infections, as an adjunct with fluorouracil after surgical resection in patients with Dukes stage C colon cancer
Cautions: pregnancy, concomitant alcohol
Contra-indications: severe liver and kidney disease, breast-feeding
Interactions: *see Appendix-2*
Side-effects: abdominal pain, nausea, vomiting, headache, dizziness, disulfiram-like adverse effects when taken concomitantly with alcohol
Dose: *oral*: ADULT & CHILD > 12 years 2.5 mg/kg, CHILD 5-12 years 80 mg and 1-4 years 40 mg as a single dose, in severe hookworm infection second dose in 3-7 day

Proprietary Preparations

Altex *(Albion),* Syrup, 40 mg/5 ml , Tk. 12.00/30ml
Asitrax *(Asiatic),* Syrup, 40 mg/5 ml , Tk. 8.00/15 ml; Tk. 12.00/30 ml
Biotrex *(Biopharma),* Syrup, 40 mg/5 ml , Tk. 15.00/30 ml ;Tk. 8.03/15 ml
Etrax *(ACI),* Syrup, 40 mg/5 ml, Tk. 24.00/30 ml ;Tab. 40 mg, Tk. 1.00/Tab.

G-Levamisole *(Gonoshasthaya),* Syrup, 40 mg/5 ml , Tk. 9.50/30 ml
Neotrax *(Acme),* Syrup, 40 mg/5 ml, Tk. 70.26/460 ml; Tk. 18.00/30 ml
Neo-Trax *(Acme),* Tab., 40 mg, Tk. 0.43/Tab.
Vermicom *(Opsonin),* Syrup, 40mg/5ml, Tk.6.98/30 ml

MEBENDAZOLE[ED]

Mebendazole, the prototype benzimidazole carbamate, is a broad-spectrum, synthetic benzimidazole antihelminthic, and is highly effective in ascariasis, intestinal capillariasis, enterobiasis, trichiuriasis and hookworm (both Ankylostoma duodenale and Necator americanus) infection as single or mixed infections. The drug is active against both larval and adult stage of nematodes and is ovicidal for ascaris, hookworm and Trichuris. Immobilization and death of susceptible gastrointestinal parasites occur slowly, and their elimination from gut may not be complete until a few days after treatment. The drug also is active against intestinal stages of Trichinella spiralis. Mebendazole has poor oral bioavailability and undergoes first-pass hepatic metabolism.
Indications: *see under Dose*
Cautions: pregnancy, lactation
Interactions: *see Appendix -2*
Side-effects: rarely abdominal pain, diarrhea; *rarely* hepatitis, convulsions, dizziness, neutropenia, urticaria, alopecia, rash including Stevens-Johnson syndrome and toxic epidermal necrolysis
Dose: *oral: pinworms/ threadworms (enterobiasis)*, ADULT & CHILD > 6 months, 100 mg as a single dose; repeat dose at 2 and 4 weeks if necessary ; *roundworm* (Ascaris lumbricoides), *hookworm* (Ankylostoma duodenale, Necator americanus), *whipworm* (Trichuris trichiura) and *Trichostrogylus infections,* ADULT & CHILD > 2 years, 100 mg twice daily for 3 days or 500 mg as a single dose, may be repeated in 2-3 weeks, CHILD < < 2 years single dose administration not allowed; *intestinal capillariasis,* 400 mg/d in divided doses for 21 or more days; *trichinosis,* 600 mg initially, increasing stepwise over 3 days to 1200-1500 mg daily in 3 divided doses for 10 days

Proprietary Preparations
Ermox *(Square),* Susp100 mg/5 ml, Tk. 18.34/30 ml ; Tab., 100 mg, Tk. 1.15/Tab.
G-Mebendazole *(Gonoshasthaya),* Tab., 100mg, Tk.0.70/Tab.; 500 mg, Tk. 1.30/Tab.
Helben *(Ad-din),* Suspn.,100 mg/5 ml, Tk. 14.80/30 ml
Mebrex *(Medimet),* Tab., 100 mg, Tk. 0.74/Tab.; Susp., 5 mg/5 ml, Tk. 14.83/30 ml
Misole *(Albion),* Susp., 100 mg/5 ml, Tk. 14.83/30ml
Panamox *(Jayson),* Tab., 100 mg, Tk. 0.74/ Tab.; Susp., 100 mg/5 ml, Tk.14.75/30 ml
Solas *(Opsonin),* Tab., 100 mg, Tk. 0.86/ Tab.;Susp., 100 mg/5 ml, Tk. 13.68/30 ml

PYRANTEL PAMOATE

This broad-spectrum antihelminthic is directed against pinworm, roundworm and hookworm infections. Pyrantel is a depolarizing neuromuscular blocker and acts by opening nonselective cation channels thus inducing marked, persistent activation of nicotinic acetylcholine receptor, which results in spastic paralysis of the worm. The drug is poorly absorbed from gut that contributes to its selective action on gastrointestinal nematodes.
Indications: roundworm (*Ascaris lumbricoides),* pinworm (*Enterobius vermicularis*), hookworm (*Ankylostoma duodenale),* trichostrongyliasis and trichinosis infections
Cautions: impaired liver function, pregnancy, lactation
Interactions: *see Appendix -2*
Side-effects: anorexia, nausea, vomiting, abdominal pain, headache, dizziness, drowsiness, insomnia, rashes and raised SGOT levels
Dose: *oral*: 10 mg/kg in a single dose (for hookworm same dose is repeated on 3 successive days and for trichinosis treatment for 5 days)

Proprietary Preparations
Melphin *(Beximco),* Susp., 50 mg/ml, Tk. 16.05/10 ml

Delentin *(Renata),* Susp., 50 mg/ml, Tk. 16.05/10 ml
Minisol *(Albion),* Susp., 50 mg/ml, Tk. 12.00/30 ml

1.5.1.6 DRUGS FOR LYMPHATIC FILARIASIS (WUCHERIA INFECTIONS)

In lymphatic filariasis (LF) host reaction to the adult worm initially causes lymphatic inflammation that can progress through stages of lymphatic obstruction and secondary attacks of bacterial cellulitis leading to lymphedema manifested by hydrocele and elephantiasis. Global program recommends that all at-risk individuals be treated once yearly orally with two drug combination: **Diethylcarbamazine** (DEC) and **Albendazole** (most countries) or DEC and ivermectin (parts of sub-Saharan Africa, Yemen).

DIETHYL CARBAMAZINE[ED]

This synthetic piperazine derivative is a filaricidal drug and acts possibly by pertubing arachidonic acid metabolism in both microfilariae and host endothelial cells with resulting vasoconstriction and aggregation of host platelets and granulocytes around membrane-damaged parasites. Microfilarial forms of susceptible filarial species such as *W. bancrofti, B. malayi and L. loa* are mostly affected. The drug causes microfilariae of *O. volvulus* to disappear from skin but does not kill microfilariae in nodules that contain the adult female worms and the microfilariae of W. bancrofti in a hydrocele, despite penetration into the fluid. Adult worms of L. loa and probably adult *W. bancrofti* and *B. malayi* also are susceptible but not adult O. volvulus. **Diethylcarbamazine** may also affect specific immune and inflammatory responses of the host. It is rapidly absorbed from gut and equilibrates with all tissues except fat.
Indications: lymphatic filariasis, treatment and prophylaxis of loiasis in temporary residents in endemic areas, visceral larva migrans
Cautions: in heavy infections there may be febrile reaction, and in heavy Loa loa infection there is a small risk of encephalopathy, in such case treatment must be given under careful in-patient supervision and stopped at the first sign of cerebral involvement; renal impairment requires dose reduction, cardiac disorders
Contra-indications: pregnancy, infants, elderly, debilitated patients
Interactions: *see Appendix -2*
Side-effects: fever, headache, anorexia, malaise, urticaria, vomiting, asthmatic attacks following the first dose are due to products of destruction of the parasite, microencephalitis, reversible proteinuria
Dose: *oral*:1 mg/kg on the first day, then increased gradually > 3 days to 6 mg/kg daily in divided doses and maintained for 21 days; *loiasis prophylaxis,* 300 mg weekly for as long as exposure occurs

Proprietory Preparation
Filazine *(Hudson),* Tab. 100 mg, Tk. 1.30/Tab.

IVERMECTIN

Ivermectin, an analog of the insecticide abamectin, is used to control and treat a wide range of infections caused by parasitic nematodes and arthropods (insects, ticks, mites) that infect livestock and domestic animals. It has proven efficacy in ascariasis, strogyloidosis, cutaneous larva migrans and lymphatic filariasis. Pinworm and whipworm infections are variably responsive and hookworm infection is unresponsive.
Indications: *see under Dose*
Cautions, Contra-indications: pregnancy; mass treatment withheld from pregnant women, children < 15 kg body weight and in the seriously ill
Interactions: *see Appendix -2*
Side-effects: in LF therapy, Mazzotti-like reaction to dying microfilariae: usually mild itching and swollen, tender lymph nodes; rarely, rarely abdominal pain, diarrhea; *rarely* severe reactions including high fever, tachycardia, hypotension, prostration, dizziness, headache, arthralgia, myalgia, diarrhea,

edema and in patients with high parasite burdens, encephalopathies; mild ocular irritation, somnolence, transient eosinophilia, raised liver enzymes also are reported

Dose: *oral*: *control of LF(* in combination with albendazole 400 mg), 200 micrograms/kg as a single annual dose for at least 5 years; *treatment of: onchocerciasi (O volvulus), ascariasis, trichuriasis,enterobiasis, strogyloidiasis,* ADULT & CHILD ≥ 5 years, 150-200 microgm/kg, single dose; *cutaneous larva migrans,* 200 micrograms/kg single dose; *treatment of hyperkeratotic scabies,* 200 micrograms/kg in combination with topical drugs

Proprietary Preparations

Ivactin *(Aristo),* Tab., 3mg, Tk. 6.00/Tab.
Scabo *(Delta),* Tab., 6 mg, Tk. 5.00/Tab.

1.5.2 DRUGS FOR CESTODE INFECTIONS

1.5.2.1 DRUGS FOR TAPEWORMS (TAENIASIS: BEEF AND PORK TAPEWORMS)
1.5.2.2 DRUGS FOR HYDATID DISEASE

1.5.2.1 DRUGS FOR TAPEWORMS

Beef tapeworm (Taenia saginata) rarely produces serious infection and is preventable by cooking beef at 60^0 C for > 5 minutes. Praziquantel is the first choice whereas niclosomide stands next. Taenia solium or pork tapeworm causes two types of infections: the intestinal form caused by the adult worm and the far more dangerous systemic form of cysticercosis, which usually co-exist, caused by the invasive larval form of the parasite. Invasion of the brain is common and dangerous: epilepsy, meningitis and raised intracranial pressure may ensue. **Albendazole** is choice of treatment for cysticercosis (treatment of neurocysticercosis demands supports of neurologist/ neurosurgeon), and niclosomide is preferred for intestinal infection.

1.5.2.2 DRUGS FOR HYDATID DISEASE (ECHINOCOCCOSIS)

Echinococcus granulosus produces unilocular, slowly growing cyst usually in liver and lung whereas E multilocularis causes multilocular invasive cysts also in the same organs. The disease may remain asymptomatic: cysts are frequently found on routine chest X-rays. Rupture of a cyst is associated with formation of localized or generalized secondary echinococcosis.

Asymptomatic patients do not always require treatment. Surgical treatment remains the method of choice in many situations. Albendazole is used in conjunction with surgery to reduce the risk of recurrence or as primary treatment in inoperable cases. Alveolar echinococcosis due to *E. multilocularis* is usually fatal if untreated. Surgical removal with albendazole cover is the treatment of choice, but where effective surgery is impossible, repeated cycles of albendazole (for a year or more) may help. Careful monitoring of liver function is particularly important during drug treatment.