Chapter 9
MUSCULOSKELETAL AND JOINT DISEASES

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9.1 DRUGS USED IN RHEUMATIC DISORDERS AND GOUT

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9.1 DRUGS USED IN RHEUMATIC DISORDERS AND GOUT

Osteoarticular or muscular pain and gradually increasing deformity and loss of function of limbs characterize rheumatic diseases. Most rheumatic diseases require symptomatic treatment to relieve pain. In degenerative joint disorders or for soft tissue lesions, paracetamol should be used first. Paracetamol *(see sec. 7.5.2.1)* is often adequate to control mild to moderate pain. However, for severe pain, and for pain and stiffness associated with an inflammatory process (inflammatory rheumatic disease) a non-steroidal anti-inflammatory drug (NSAID) is indicated.

Steroids are useful for control of acute exacerbation of inflammatory arthritis, which are not being controlled easily with NSAIDs. A short sharp course of steroid is indicated in these cases. Intra-articular injections of long acting steroid preparations for local action on inflamed joints are also very useful in selected cases. Recent evidence has suggested that corticosteroids may also be able to reduce the rate of joint destruction in rheumatoid arthritis.

Drugs are available which affect the disease process itself and favourably influence the outcome. For rheumatoid arthritis the drugs currently available in Bangladesh include penicillamine, chloroquine, hydroxychloroquine, immunosuppressants (azathioprine, cyclosporin, cyclophosphamide, methotrexate and leflunomide), sulfasalazine - they are called disease modifying anti rheumatic drugs (DMARDs). Drugs that act on the disease process in psoriatic arthritis include azathioprine and methotrexate. For gout they include uricosuric drugs and allopurinol.

9.1.1 NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDs)

In single doses NSAIDs have analgesic activity comparable to that of paracetamol *(see section on paracetamol)*, but paracetamol is preferred, particularly in the elderly.

In regular full dosage NSAIDs have both lasting analgesic and anti-inflammatory effects, which make them particularly useful for the treatment of continuous or regular pain associated with inflammation. Therefore, NSAIDs are more appropriate than paracetamol in inflammatory arthritis (e.g. rheumatoid arthritis, juvenile chronic arthritis, ankylosing spondylitis) and in advanced osteoarthritis (osteoarthrosis). They are also of benefit in the less well defined conditions of back pain and soft-tissue disorders.

Choice: Differences in anti-inflammatory activity between different NSAIDs are small, but there is considerable variation in individual patient response. About 60% of patients will respond to any NSAID; of the others, those who do not respond to one may well respond to another. An analgesic effect should normally be obtained within a week, whereas an anti-inflammatory effect may not be achieved (or may not be clinically assessable) for up to three weeks. If appropriate responses are not obtained within these times, another NSAID should be tried. The main differences between NSAIDs are in the incidence and type of side effects. Before treatment is started the, prescriber should weigh efficacy against side-effects.

Ibuprofen has anti-inflammatory, analgesic and antipyretic properties. It has fewer side effects than other NSAIDs but its anti-inflammatory properties are weaker. It is suitable for conditions where there is mild to moderate pain with mild inflammation.

Ketoprofen has anti-inflammatory properties similar to ibuprofen and has more side effects.

Flurbiprofen has stronger anti-inflammatory effects than ibuprofen with more gastro-intestinal side effects.

Mefenamic acid has minor anti-inflammatory properties. Side-effects include diarrhoea and occasionally haemolytic anaemia.

Tolmetin is comparable to ibuprofen.

Naproxen is the first choice for conditions with moderate to severe inflammation associated with pain. It combines good efficacy with a low incidence of side effects (but more than ibuprofen). Naproxen is concentrated in synovial fluid, so it is advantageous for treating chronically inflamed joints.

Diclofenac has actions similar to that of naproxen. Its side effects are also similar to naproxen.

Aceclofenac, comparable to naproxen in its analgesic and anti-inflammatory properties, has a chondroprotective property, which may be useful for long term manage-ment of osteoarthritis. It is also effective in rheumatoid arthritis and ankylosing spondylitis. It is well tolerated, thus suitable for the elderly.

Oxaprozin has analgesic and anti-inflammatory properties making it an alternative treatment for rheumatic conditions.

Salsalate is comparable to naproxen in action with less gastrointestinal side-effects.

Sulindac is similar in tolerance to naproxen.

Etodolac is comparable in efficacy to naproxen with less tendency for gastric irritation.

Piroxicam, meloxicam and **tenoxicam** are similar in activity to naproxen. They have more gastro-intestinal side effects than ibuprofen. All of these drugs have long half-lives, and can be conveniently given in a once daily dose.

Indometacin has the strongest anti-inflammatory effect of all NSAIDs currently available in Bangladesh. But it also has a high incidence of side effects including gastro-intestinal disturbances, headache and dizziness. It should be the first drug for acute gout, severe rheumatoid arthritis and severe ankylosing spondilitis.

Acemetacin to inis the glycolic acid ester of indometacin. It is a pro-drug as it is converted to indometacin in the body. It has strong anti-inflammatory action and is more tolerable than indometacin.

In regular high dosage **aspirin** has about the same anti-inflammatory effect as other NSAIDs. The required dose for active inflammatory joint diseases is at least 3.6 g daily. Nausia, dyspepsia and gastrointestinal bleeding are common with any dose of aspirin, and are much higher with anti-inflammatory dose. Dizziness, tinnitus and deafness (salicylism) can occur with chronic aspirin ingestion.

Ketorolac is indicated for short-term treatment of moderate to severe painful conditions including post-operative pain.

Rofecoxib,Valdecoxib and Nime-sulide**,**all COX-2 inhibitors, have been withdrawn because of cardiovascular side effects.

Celecoxib, a COX-2 inhibitor is useful for long term use in chronic arthritis. It also has minimal side effects.

Note : All NSAIDs can produce severe upper gastrointestinal side effects including bleeding and perforation. Selective COX-2 inhibitors have lower risk of serious upper gastrointestinal side effects, but can produce serious cardiovascular side effects. Patients receiving a COX-2 inhibitor who have cardiovascular disease or ischaemic heart disease should be switched to alternative treatments as soon as possible.

Etoricoxib, a COX-2 inhibitor, is indicated for symptomatic relief of osteoarthritis, rheumatic arthritis and acute gout.

Cautions and Contraindications: NSAIDs should be used with caution in the elderly, in allergic disorders, during pregnancy and breast feeding, and in coagulative defects.

In patients with renal, hepatic or cardiac impairment caution is required since the use of NSAIDs may result in deterioration of renal function. In these conditions, the lowest effective dose should be used and renal function should be regularly monitored. Renal failure may be provoked by NSAIDs, especially in patients with pre-existing renal impairment. Rarely, NSAIDs may induce papillary necrosis or interstitial fibrosis which may lead to renal failure.

NSAIDs are contraindicated in patients with active peptic ulceration. They should be avoided in patients with previous gastrointestinal bleeding or ulceration, and should be withdrawn if gastro-intestinal lesions develop. NSAIDs should also be used with caution in Crohn's disease or ulcerative colitis, as these conditions may be exasperated.They are also contra-indicated in patients with a history of hypersensitivity to any other NSAIDs - which include asthma, angio-oedema, urticaria or rhinitis.

NSAIDs can induce marked fluid retention and can induce or exacerbate hypertension. In severe heart failure, all NSAIDs are contra-indicated. Diclofenac and selective COX-2 inhibitors (celecoxib, etoricoxib) are contra-indicated in cerebrovascular disease, peripheral arterial disease, ischaemic heart disease and mild to severe heart failure. They should be used with caution in patients with a past history of cardiac failure, hypertension and in patients with oedema for any other reason. Other non-selective NSAIDs should be used with caution in hypertension, heart failure, ischaemic heart disease, peripheral arterial disease and cerebrovascular disease.

Interactions: *see Appendix-2.*

Side effects: There are considerable variations in severity and frequency of side effects of NSAIDs. Gastro-intestinal discomforts, diarrhoea, and occasionally bleeding and ulceration occur. The susceptibility to develop these side effects while using a specific NSAID varies from patient to patient. Taking these drugs with food or milk may minimize dyspepsia. Concomitant use of ranitidine or any other H_2 blocker is strongly recommended to counteract or minimize dyspepsia. Other side effects include hypersensitivity reactions (particularly rashes, bronchospasm and angioedema), headache, dizziness, vertigo, tinnitus, photosensitivity and haematuria. Blood disorders have also

occurred. Fluid retention may occur. Renal failure can be provoked by NSAIDs. Hepatic damage, alveolitis, pancreatitis, eye changes, Steven-Johnson syndrome and toxic epidermal necrolysis are other rare side-effects. Induction or exacerbation of colitis or Crohn's disease has been reported. Aseptic meningitis has been reported rarely with NSAIDs; patients with connective tissue disorders such as systemic lupus erythematosus may be especially susceptible.

Topical NSAIDs (e.g. ketoprofen, diclofenac, naproxen) may provide some relief of painful musculoskeletal conditions like sprain and sports injury.

Cautions: These preparations should be applied with gentle massage only. Contact with eyes, mucous membrane, and inflamed or broken skin should be avoided. If rash develops, their use must be discontinued. Hands should be washed immediately after use. Not to be used with occlusive dressings. Topical applications of large amounts may result in systemic absorption, resulting in adverse effects such as hypersensitivity and asthma. Photosensitivity may also develop; patients should be advised against excessive exposure to sunlight of areas treated with topical preparations.

ACECLOFENAC

Indications: pain and inflammation in osteoarthritis, rheumatoid arthritis and ankylosing spondylitis

Cautions: avoid in porphyria; *see notes above*

Interactions: *see Appendix-2*

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

Dose: 100 mg twice daily (reduce to 100 mg daily in hepatic impairment). Child not recommended

Proprietary Preparations

Ac PR *(Pacific),* Tab.100 mg, Tk. 3.01/Tab.
Acebid *(Beacon),* Tab. 100mg, Tk. 4/Tab.
Acecloben *(Benham),*Tab. 100mg,Tk. 3/Tab
Aceclofen *(Astra),* Tab, 100mg, Tk. 3/Tab.
Aceclofenac *(Albion),* Tab. 100mg, Tab. Tk. 2.50/Tab.
Acecol *(Ziska),* Tab., 100 mg, Tk. 2.00/Tab.
Acedol *(Concord),* Tab. 100mg, Tk. 3/Tab.
Acefenac *(General),* Tab. 100mg, Tk. 4/Tab.
Acelon *(Central),* Tab. 100mg, Tk. 3.00/Tab.
Acepro*(White Horse),*Tab.100mg,Tk.3/Tab.
Aclo *(Alco),* Tab. 100mg, Tk. 3.00/Tab.
Aclonac *(Pharmasia),*Tab.100mg,Tk. 3/Tab.
Aclopain *(RAK),* Tab.100mg, Tk. 4.00/Tab.
Alona *(Kemiko),* Tab. 100mg, Tk. 4.00/Tab.
Apeclo *(Apex),* Tab. 100 mg, Tk. 1.50/Tab.
Apitac *(Acme),* Tab.100mg, Tk. 4.00/Tab.
Aros *(Globe),* Tab., 100 mg, Tk. 3.00/Tab.
Avenac *(Radiant),* Tab. 100mg, Tk. 5/Tab.
Biosnac *(Bios Pharma),* Tab.100mg, Tk. 2.75/Tab.
Ceclofen *(Renata),* Tab. 100mg, Tk. 4/Tab.
Ceconac *(Hudson),* Tab., 100mg, Tk.3/Tab.
Celofen *(ACI),* Tab. 100mg, Tk. 4.00/Tab.
Clof *(Biopharma),* Tab. 100 mg, Tk. 4/Tab.
Clofenta *(Amico Lab),* Tab. 100mg, Tk. 3/Tab.
Clomak *(Maks),* Tab. 100mg, Tk. 4.00/Tab.
Ena *(Asiatic),* Tab. 100mg, Tk. 3.00/Tab.
Ezemove *(Globex),* Tab. 100mg, Tk. 4/Tab.
Fleco *(Ad-din),* Tab., 100mg, Tk. 2.50/Tab.
Flexi *(Square),* Tab. 100 mg, Tk. 4.00/Tab.
Flexivan*(NiproJMI),*Tab.100mg,Tk.4.00/Tab.
Hifenac *(Doctor TIMS),* Tab.100mg,Tk. 4/Tab.
Mervan *(Aristo),* Tab. 100mg, Tk. 4.00/Tab.
Movex *(Opsonin),* Tab.100mg, Tk. 3.01/Tab.
Noak *(Orion),* Tab. 100mg, Tk. 4.00/Tab.
Nofenac *(Drug Intl),* Tab. 100mg, Tk. 4/Tab.
Orcenac *(Organic),* Tab. 100mg, Tk. 4/Tab.
Ostoflex *(Somatec),* Tab. 100mg, Tk. 4/Tab.
Painex *(Chemist),* Tab., 100 mg, Tk. 4/Tab.
Painkil *(Veritas),* Tab. 100mg,Tk. 4.00/Tab.
Paino *(Eskayef),* Tab, 100 mg, Tk. 4.00/Tab.
Penac *(APC),* Tab.100mg, Tk. 3.00/Tab.
Polynac *(Leon),* Tab. 100mg, Tk. 4.00/Tab.
Preservin *(Ibn Sina),* Tab. 100mg, Tk. 4/Tab.
Qrip *(Sanofi),* Tab. 100mg, Tk. 4.00/Tab.
Repidor *(Rephco),* Tab. 100mg, Tk. 3/Tab.
Reservix *(Incepta),*Tab. 100mg,Tk. 4/Tab.
Rheunil *(Amulet),* Tab. 100 mg, Tk. 3/Tab.
Rumac *(Sonear),* Tab. 100mg, Tk. 4/Tab.
Syclofen *(MST),* Tab., 100 mg, TK. 3/Tab.
Ternilla *(Healthcare),* Tab. 100 mg, Tk. 5/Tab.
Vaxtin *(Novartis),* Tab. 100mg, Tk. 5.00/Tab.
Xyfen *(Supreme),* Tab. 100mg, Tk.4.00/Tab.
Zerodol *(Navana),* Tab.100mg, Tk.3.01/Tab.
Zolfin *(Beximco),* Tab. 100mg, Tk. 4.00/Tab.
Zolonac *(Sharif),* Tab. 100mg, Tk. 4.00/Tab.

ACEMETACIN

Indications: pain and inflammation in rheumatic disease and other musculo-skeletal disorders, postoperative analgesia

Cautions: *see* under indometacin and notes above; driving and performance of skilled activities may be affected due to dizziness

Contra-indications: *see notes above*

Proprietary Preparation
Tendonil *(Orion),* Cap., 60 mg, Tk. 8/Cap.

CELECOXIB

Indications: rheumatoid arthritis, advanced osteoarthritis, chronic musculoskeletal pain, post surgical and dental pain; adenomatus poliposis coli

Cautions: hypertension, liver failure, renal failure; *see notes above*

Contraindications: known hypersensitivity to this drug and sulfonamides; aspirin induced asthma, *see notes above*

Interactions: *see Appendix-2*

Side-effects: *see notes above;* headache and dyspepsia; rashes, gastrointestinal upset, headache, insomnia, abnormal liver function tests

Dose: rheumatoid arthritis, 100-200 mg twice a day; osteoarthritis, 100 mg twice a day; not recommended below 18 years as there is no clinical data available for this age group

Proprietary Preparations
Celenta *(Incepta),* Cap. 100 mg, Tk. 4.50/Cap.
Cox B *(Beximco),* Cap. 100 mg, Tk. 4.50/Cap; 200 mg, Tk. 8.00/Cap.
Coxib *(Alco),* Cap. 100 mg, Tk. 4.05/Cap.; 200 mg, Tk. 7.05/Cap.
Celeco *(Medimet),* Cap., 200mg, Tk.8.00/cap.; 100mg, Tk.4.50/Cap.
Celoxib *(Ziska),* Cap., 100mg, Tk. 4.50/Cap

DEXIBRUPOFEN

Indications: mild to moderate pain and inflammation associated with osteoarthritis and other musculoskeletal disorders; dysmenorrhoea and dental pain

Caution, Contra-indications and Side-effects: *see notes above*

Dose: 600-900 mg daily in 3 divided doses; max. 1.2g daily; max. single dose 400 mg

Proprietary Preparations
Artoflex*(Opsonin),* Tab., 300 mg , Tk. 3.02/Tab.; Tab., 400 mg, Tk. 3.77/Tb.
Dexibu *(General),* Tab. , 200 mg, Tk. 3.01/Tab.;Tab. , 400 mg, Tk. 5.02/Tab.;Tab., 300 mg, Tk. 4.02/Tab.
Dexibuprofen *(Albion),* Tab., 300 mg, Tk.4.00/Tab.
Dexifen *(Beximco),* Susp.,100 mg/ 5ml, Tk. 40.00/100 ml ;Tab. , 300 mg, Tk. 4.00/Tab. Tab. , 400 mg, Tk. 5.00/Tab.
Dexpro *(Orion),* Tab., 300 mg, Tk. 4.02/Tab.; Tab. , 400 mg, Tk. 5.02/Tab.
Dip *(Alco),* Tab., 200 mg, Tk. 3.00/Tab. ; Tab. , 400 mg, Tk. 5.00/Tab.
Fendex *(Asiatic),* Tab., 300 mg, Tk. 4.00/Tab.; Tab. , 400 mg, Tk. 5.00/Tab.
Flamex-DX *(ACI),* Tab. , 200 mg , Tk. 3.01/Tab. ;Tab. , 300 mg , Tk. 4.02/Tab.; Tab., 400 mg , Tk. 5.02/Tab.
Inflam *(Sanofi),* Susp.,100 mg/5 ml, Tk. 33.70/100 ml ;Tab., 300 mg, Tk. 4.02/Tab.;, Tab., 400 mg, Tk. 5.02/Tab.
Purifen *(Incepta),* Tab., 200 mg, Tk. 3/Tab.; Susp., 2 gm/100 ml , Tk. 40/100 ml ;Tab., 300mg, Tk. 4/Tab.; Tab., 400 mg, Tk. 5/Tab.
Xflam *(Square),* Tab., 300 mg, Tk. 4.01/Tab.; Tab., 400 mg, Tk. 5.01/Tab.
Xibu *(RAK),* Tab., 300 mg, Tk. 4.00/Tab.

DEXKETOPROFEN

Indications: short term treatment of mild to moderate pain and inflammation including dysmenorrhoea

Caution, Contra-indications and Side-effects: *see notes above*

Dose: 12.5 mg every 4-6 hours or 25 mg every 8 hours; max. 75 mg daily; ELDERLY initially max. 50 mg daily; CHILD not recommended

Proprietary Preparations
Actidex *(Incepta),* Tab. 25 mg, Tk. 4.00/Tab
Keto-D *(Acme),* Tab. 25 mg, Tk. 4.01/Tab.

DICLOFENAC POTASSIUM

Indications: pain and inflammation in rheumatic disease and other musculo-skeletal disorders; acute gout; post-operative pain; migraine

Caution, Contra-indications and Side-effects: *see notes above*

Dose: rheumatic disease, musculoskeletal disorders, acute gout, postoperative pain, 75-150 mg in 2-3 divided doses; CHILD over 14 years, 75-100 mg in 2-3 divided doses

Migraine, 50 mg at onset, repeated after 2 hours if necessary, then after 4-6 hours; max. 200 mg daily; CHILD not recommended

Proprietary Preparations

Cataflam *(Novartis),* Tab.,25 mg, Tk. 4/Tab., 50 mg, Tk. 6.50/Tab.
Intafenac K *(Incepta),*Tab. 50 mg,Tk. 3/Tab.
Kalinac *(Square),* Tab. 50 mg, Tk. 4.01/Tab.
Nopain *(Drug Int.),* Tab., 25 mg, Tk. 2/Tab

DICLOFENAC SODIUM

(*see also 8.1.4.2)*

Indications: acute post-traumatic musculoskeletal pain, rheumatoid arthritis (including JCA), advanced osteoarthritis, acute gout, dysmenorrhoea, and post-operative pain

Cautions, Contraindications and Side-effects: suppositories may cause rectal irritation;*see notes above*

Interactions: *see Appendix-2*

Dose:*by mouth*, 75-150 mg in 2 to 3 divided doses, preferably after meals. Dispersible preparations may be taken dissolved in water for rapid control of pain (for short period only). Slow release (SR) preparations, 100 mg once daily after meals (for management of chronic painful or inflammatory conditions)

By rectum in suppositories, 50 mg once to thrice a daily

By injections, 75 mg once or twice daily by IM injections into gluteal muscles for not more than 3 days. IV injections can be administered (in hospital settings, for post operative pain relief), 75 mg dissolved in 100 ml **Normal Saline** by slow infusion over 60 minutes, repeated in 4 to 6 hours if necessary

Maximum total daily dose by any or a combination of routes is 150 mg

CHILD 1-12 years, for JCA, can be given by mouth or by rectum 1-3 mg/kg daily in divided doses (as 25 mg tablets or 12.5 mg suppositories)

Proprietary Preparations

A-Fenac *(Acme),* Gel, 1%, Tk. 13.05/10 gm; Supp., 12.5 mg, Tk. 8.04/Supp.; Supp, 50mg, Tk. 14.06/Supp.; Tab., 25 mg, Tk. 0.55/Tab.; 50 mg, Tk. 0.84/Tab.**;**Tab., 50 mg, Tk. 3.00/Tab.; Tab., 100 mg, Tk. 3.00/Tab.
A-Fenac *(Acme),* Inj., 75 mg/3 ml, Tk.14.06/3ml amp.
Anodyne *(Ibn Sina),* Gel, 1%, Tk. 13.00/10 gm; SR Cap., 100 mg, Tk. 3.25/Cap.; Tab. 50 mg, Tk. 1.00/Tab.
Apain *(Kemiko),* TR Cap. ,100 mg, Tk. 3/Cap.
Apnac *(Supreme),* Tab. , 50mg, Tk. 4.01/Tab.
Beonac *(Benham),* Tab., 50 mg, Tk. 0.80/Tab.
C-fenac *(Chemist),* Inj., 3 ml, Tk. 37.10/3 ml amp.; Tab., 50 mg, Tk. 0.30/Tab.
Clofenac *(Square),* Tab. , 50 mg, Tk. 4.00/Tab. ;Gel, 1%, Tk. 12.95/10 gm**;** Inj., 75 mg /3 ml, Tk. 15.05/Amp. ;SR Tab. , 100 mg, Tk. 4.00/Tab.; Supp., 12.5 mg, Tk. 9.03/Supp. Supp , 100 mg, Tk. 20.00/Supp.;, 25 mg, Tk. 12.05/Supp. ; Supp., 50 mg, Tk. 15.05/Supp.; Tab., 25 mg, Tk. 1.00/Tab. ; Tab., 50 mg, Tk. 1.50/Tab.; TR Cap., 100 mg, Tk. 4.00/Cap.
Clonac *(Somatec),* TR Cap. , 100 mg, Tk. 3.01/Cap.
DFC *(Amulet),* Tab. , 100 mg, Tk. 2.50/Tab.
Diclofen *(Opsonin),* Gel, 1%, Tk. 9.74/10 gm;Inj., 75 mg/3ml, Tk. 11.32/Amp.;SR Tab., 100 mg, Tk. 2.26/Tab.; Tab., 25 mg, Tk. 0.39/Tab.; 50 mg, Tk. 0.66/Tab.Supp 100 mg, Tk. 15.04/Supp., ; 12.5 mg, Tk. 6.79/Supp;25 mg, Tk. 9.06/Supp.; 50 mg, Tk. 7.55/Supp.;
Diclofenac *(Albion),* Gel, 1%, Tk. 12.96/10 gm ;Tab. , 100 mg, Tk. 3.00/Tab. ; 50 mg, Tk. 0.50/Tab. ;TR Cap. , 100 mg, Tk. 3.00/Cap.
Diclon *(Central),* SR Cap. , 100 mg , Tk. 3.00/Cap. ;Tab. , 50 mg, Tk. 0.85/Tab.
Diclonac *(Ziska),* Tab. , 50mg, Tk. 0.83/Tab.; Inj., 75mg/3ml, Tk. 8.50/3ml Amp. ; TR Cap., 100mg, Tk. 3.00/Cap.
Diclorex *(Medimet),* Inj., 75mg, Tk.9.50/3 ml Amp.; Retard Tab., 100mg, Tk.3.00/Tab.; Tab., 25mg, Tk.0.54/Tab.; 50mg, Tk.0.70/Tab
Difenac *(Rephco),* CR Cap. , 100 mg, Tk. 2.50/Cap. ; Tab., 50 mg, Tk. 0.90/Tab.
Dinac *(Navana),* TR Cap., 100 mg, Tk. 2.00/Cap.
Dix-TR *(Apex),* SR Cap. , 100 mg, Tk. 1.50/Cap.
Erdon *(Aristo),* Gel , 1%, Tk. 12.90/10 gm ; Supp., 50 mg, Tk. 15.00/Supp.; TR Cap., 100 mg, Tk. 3.00/Cap.

G-Diclofenac *(Gonoshasthaya),* Inj, 75 mg/3ml, Tk. 9.00/Amp.;Tab. , 50 mg, Tk. 0.60/Tab.
Genac *(Globe),* Inj., 75 mg /3 ml, Tk. 14.00/3ml Amp.; Tab., 50 mg, Tk. 0.80/Tab.
Hi-fenac *(Hudson),* Tab., 50mg, Tk.0.50/Tab.; TR Cap., 100mg, Tk.3.00/Tab.
Hitflam *(Ambee),* Tab., 50 mg , Tk.0.84/ Tab; Gel, 10 mg/ gm, Tk. 12.95/1 gm; Inj., 75 mg/3 ml, Tk. 7.62 /3 ml amp; SR Tab., 100 mg , Tk.3.05/ Tab
Intafenac *(Incepta),* Inj., 75 mg/3 ml, Tk. 9.50/Amp. ;Tab. , 50 mg, Tk. 0.75/Tab.
Jefenac *(Ad-din),* TR Cap., 100mg, Tk. 3.00/Cap.; Supp., 12.5 mg, Tk. 7.50/Supp; Supp., 50 mg, Tk. 12.00/Supp.; Tab., 50mg, Tk.0.60/Tab.; Gel,0.01 gm/gm, Tk.12.90/10gm
Locopain *(Asiatic),* Tab., 50 mg, Tk. 0.40/Tab.;TR Cap., 100 mg, Tk. 3.00/Cap.
Makfena *(Maks),* TR Cap., 100 mg, Tk. 3.00/Cap.
Megafen *(Jayson),* Inj, 75 mg/3 ml, Tk. 10.15/Amp. Tab. , 100 mg, Tk. 3.02/Tab. ;50 mg, Tk. 0.81/Tab.
Mobifen *(ACI),* Tab. , 50 mg, Tk. 0.88/Tab.
Moov *(Astra),* SR Capsule, 100 mg, Tk. 2.50/Cap.
Movonac *(Sharif),* Tab., 50 mg, Tk. 0.80/Tab.; TR Tab., 100 mg, Tk. 3.00/Cap.
Nab *(Bios),* Tab. , 50 mg, Tk. 0.78/Tab. ; 50 mg, Tk. 0.78/Tab. ;TR Cap. , 100 mg , Tk. 2.95/Cap. ; TR Cap. 100 mg, Tk.2.95/Cap.
Nasida *(Delta),* SR Cap. , 100 mg, Tk. 1.50/Cap.
Nopain *(Drug Int.),* Tab. , 50 mg, Tk. 4.00/Tab.
Novarin *(Amico),* Gel, 1%, Tk. 12.90/10 gm; Tk.26.00/20 gm; SR Cap., 100 mg, Tk. 2.50/Cap.; Tab., 50 mg, Tk. 0.51/Tab.
Orafen *(Rangs),* SR Tab.,100mg,Tk. 3/Tab.
Orfenac *(Orion),* Tab., 50 mg, Tk. 0.80/Tab.; TR Cap., 100 mg, Tk. 3.01/Cap.
Orgafen *(Organic),* TR Cap. , 100 mg, Tk. 3.00/Cap.
Panfre *(Pacific),* SR Cap., 100 mg, Tk. 2.26/Cap.
Penac *(APC),* Tab., 50 mg, Tk. 0.75/Tab.; TR Cap., 100 mg, Tk. 3.00/Cap.
Profenac *(Popular),* Gel, 1%, Tk. 12.95/10gm;Inj., 75 mg/3 ml, Tk. 9.54/Amp.
Proladin *(Alco),* Tab., 50 mg, Tk.0.75/Tab.; TR Cap. , 100 mg, Tk. 3.00/Cap.
Ronac *(General),* Inj., 75 mg/3 ml , Tk. 15.00/Amp
Ultrafen *(Beximco),* Inj., 75 mg/3 ml, Tk. 15.00/Amp ;SR Tab. , 100 mg, Tk. 3.00/Tab.; Supp., 12.50 mg, Tk. 9.00/Supp.; 50 mg, Tk. 15.00/Supp. **;**Tab. 25 mg, Tk. 0.54/Tab.; 50 mg, Tk. 0.83/Tab.
Velofen *(Leon),* TR Cap.,100 mg,Tk. 3/Cap.
Volcan *(Biopharma),* SR Tab. , 100 mg, Tk. 3.01/Tab. ; Tab. , 50 mg, Tk. 0.80/Tab., TR Cap. , 100 mg, Tk. 3.01/Cap
Voligel *(Beximco),* Gel, 1%, Tk. 97.00/50 gm
Volmax *(Eskayef),* SR Cap, 100 mg , Tk. 3.00/Cap.
Voltalin *(Novartis),* Inj., 75 mg/3 ml, Tk. 110.00/3 ml amp.
Voltalin *(Novartis),* SR Tab. , 100 mg, Tk. 15.00/Tab.SR Tab. , 75 mg, Tk. 11.00/Tab.**;**Supp., 12.5 mg, Tk. 26.00/Supp.**;** 50 mg, Tk. 50.00/Supp.;Tab. , 25 mg, Tk. 4.00/Tab.;. Inj., 75 mg/3 ml, Tk. 22.00/Amp
Voltalin Forte *(Novartis),* Tab., 50 mg, Tk. 7.00/Tab.
Voltid *(Pharmasia),* Gel, 1%, Tk.12.95/10 gm ; SR Cap. , 100 mg, Tk. 3.02/Cap. ;Tab., 50 mg, Tk. 0.60/Tab.

Diclofena 75 mg + Lidocaine 20 mg/2ml
A-Fenac Plus *(Acme),* Inj., Tk. 14.06/2 ml Amp.
Anodyne Plus *(Ibn Sina),* Inj., , Tk. 12.00/2 ml Amp.
Apain Plus *(Kemiko),* Inj., Tk. 15.00/2 ml Amp.
Arthrpfen Plus *(Healthcare),* Inj., Tk. 23.00/2 ml Amp.
C-fenac plus *(Chemist),* Inj., Tk. 11.90/2 ml Amp.
Clofenac Plus *(Square),* Inj., Tk.15.05/2 ml Amp.
Diclofen Plus *(Opsonin),* Inj., , Tk. 11.32/2 ml Amp.
Diclonac plus *(Ziska),* Inj., Tk. 9.50/2ml Amp.
Difenac Plus *(Rephco),* Inj., Tk. 10.00/2 ml Amp.
Dix Plus *(Apex),* Inj., 7 Tk. 9.50/2 ml Amp.
Erdon Plus *(Aristo),* Inj., Tk. 15.00/2 ml Amp.
Genac- plus *(Globe),* Inj., Tk. 15.00/2 ml Amp.
Intafenac Plus *(Incepta),* Inj., Tk. 9.50/2 ml Amp.
Megafen Plus *(Jayson),* Inj., , Tk. 15.00/2 ml Amp.
Mobifen Plus *(ACI),* Inj.,, Tk. 9.54/2 ml Amp.
Orafen plus *(Rangs),* Inj., Tk. 15.00/2 ml Amp.
Orfenac Plus *(Orion),* Inj.,Tk. 9.03/2 ml Amp.
Profenac L *(Popular),* Inj., Tk. 9.54/2 ml Amp.
Ultrafen Extra *(Beximco),* Inj., Tk. 15.00/2 ml Amp.

Misoprostol + Diclofenac Sodium
Misoclo *(General),* Tab., 20 mg + 50 mg, Tk. 10.04/Tab.
Misoclo *(General),* Tab., 20 mg + 75 mg, Tk. 11.04/Tab.
Nopain Extra *(Drug Int.),* Tab. , 200 mcg + 75 mg, Tk. 11.00/Tab.
Novarin Plus *(Amico Lab),* Tab. , 200 mcg + 75 mg, Tk. 6.00/Tab.

Diclofenac free acid
Voltlin D*(Novartis),* Tab, 50mg mg, Tk.6.50/Tab
Clofenac DT *(Square),* Tab. 50mg, Tk.2.00/Tab.

ETODOLAC

Indications: pain and inflammation in rheumatoid arthritis and osteoarthritis

Cautions: avoid in severe renal impairment, *see notes above*

Contra-indication: *see notes above*

Side-effects: pyrexia, tremor, palpitation, dyspnoea, confusion, fatigue, paraesthesia, dysuria and pruritus; *see notes above;*

Dose: ADULT over 18 years, 300-600 mg daily in 1-2 divided doses

Proprietary Preparations

Panodin *(Square),* SR Tab. , 600 mg, Tk. 15.05/Tab.
Edopain *(Incepta),* Cap. , 300 mg , Tk. 8.00/Cap.; ER Tab. , 600 mg, Tk. 18.00/Tab.
Edolac *(Opsonin),* Cap., 300 mg, Tk. 6.04/Cap.; ER Tab., 600 mg, Tk. 13.59/Tab.
Etogesic *(Acme),* SR Tab. , 600 mg, Tk. 15.00/Tab.

ETORICOXIB

Indications: pain and inflammation in osteoarthritis, rheumatoid arthritis and acute gout
Cautions: monitor blood pressure, breast-feeding, *see notes above*
Contra-indications: uncontrolled hypertension, inflammatory bowel diseases, *see notes above*
Interactions: *see Appendix-2*
Side effects: dry mouth, taste disturbance, mouth ulcers, flatulence, constipation, chest pain, paraesthesia, myalgia, *see notes above*
Dose: osteoarthritis, ADULT and ADO-LESCENT over 16 years, 60mg once daily. Rheumatoid arthritis, ADULT and ADOLESCENT over 16 years, 90mg once daily. Acute gout, ADULT and ADOLESCENT over 16 years, 120mg once daily

Proprietary Preparations

Algirex *(Ibn Sina),* Tab., 120 mg, Tk. 14.25/Tab.; 60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.
Aroxia *(Ad-din),* Tab., 120mg, Tk. 10.00/Tab.; 60mg , Tk. 6.00 /Tab.; 90mg , Tk. 8.00/Tab.
Artorix *(Asiatic),* Tab., 120 mg, Tk. 14.00/Tab.; 60 mg, Tk. 7.00/Tab;. 90 mg, Tk. 12.00/Tab.
Cox-E *(Popular),* Tab., 120 mg, Tk. 14.00/Tab. 60 mg, Tk. 7.00/Tab. 90 mg, Tk. 12.00/Tab.
Coxet *(Pacific),* Tab., 120 mg, Tk. 10.53/Tab.; 90 mg, 30's, Tk. 9.02/Tab.
Coxetori *(Amulet),* Tab., 60 mg, , Tk. 7.00/Tab.
Coxfree *(Kemiko),* Tab., 120 mg, Tk. 14.00/Tab.;60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.
Coxia *(ACI),* Tab., 120 mg , 20s, Tk. 14.05/Tab.; 60 mg, Tk. 7.03/Tab.; 90 mg Tk. 12.05/Tab.
Coxitor *(Beacon),* Tab., 60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.
Ecox *(Alco),* Tab., 120 mg, Tk. 14.00/Tab. ;60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.
Eflam *(Apex),* Tab., 120 mg, Tk. 14.00/Tab.; 60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.
Eroflam *(Orion),* Tab., 60 mg, Tk. 7.00/Tab.; Tab., 90 mg, Tk. 12.00/Tab.
Eto *(Delta),* Tab., 120 mg, Tk. 12.00/Tab. ;60 mg, Tk. 7.00/Tab. ;90 mg, Tk. 10.00/Tab.
Etocox *(General),* Tab., 120 mg, Tk.14.05/ Tab.; Tab., 60 mg, Tk. 7.03/Tab.;90 mg, Tk. 12.05/Tab.
Etoflam *(RAK),* Tab., 120 mg, Tk. 14.00/Tab.; 60 mg, Tk. 7.00/Tab.;90 mg, Tk. 12.00/Tab.
Etoricoxib *(Albion),* Tab., 120 mg, , Tk. 14.00/Tab.; Tab., 60 mg, Tk. 7.00/Tab.; Tab., 90 m, Tk. 12.00/Tab.
Etoriflex *(Somatec),* Tab., 60 mg, 30, Tk. 7.00/Tab. ;Tab., 90 mg, 30, Tk. 12.00/Tab.
Etorix *(Eskayef),* Tab., 120 mg , Tk. 14.00/Tab.; 60 mg, Tk. 7.00/Tab;. 90 mg, Tk. 12.00/Tab.
Etoxib *(Globe),* Tab., 60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.; 120 mg, Tk. 14 / Tab.
Etrib *(Nipro JMI),* Tab., 60 mg, Tk. 7.00/Tab;90 mg, Tk. 12.00/Tab.
Oricox *(Incepta),* Tab., 120 mg, Tk. 14/Tab.; 60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.
Oxetori *(Amulet),* Tab., 120 mg, Tk. 14/Tab.
Retoz *(MST),* Tab., 90 mg, Tk. 12/Tab.
Ribox *(Beximco),* Tab., 120 mg, Tk. 14/Tab.; 60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 12.00/Tab.
Rito *(Opsonin),* Tab., 120 mg, Tk. 10.56/Tab.; 60 mg, Tk. 5.29/Tab.;90 mg, Tk. 9.06/Tab.
Setorib *(Acme),* Tab., 120 mg, Tk. 14.06/Tab.;Tab., 60 mg, Tk. 7.02/Tab.;Tab., 90 mg, Tk. 12.05/Tab.
Tory *(Square),* Tab.,120 mg, Tk. 14.06/Tab.; 60 mg, Tk.7.02/Tab.; Tab., 90 mg, Tk. 12.05/Tab.

Vargus *(Novartis),* Tab., 120 mg Tk. 17.00/Tab; 60 mg, Tk. 9.00/Tab. ;90 mg, Tk. 15.00/Tab.
X Dol *(Concord),* Tab., 120 mg, Tk. 14.00/Tab.; 60 mg, Tk. 7.00/Tab.**;** Tab., 90 mg, Tk. 12.00/Tab.
Xibra *(Aristo),* Tab., 120mg, Tk. 14.00/Tab.; 60 mg, Tk. 7.00/Tab.; 90 mg, Tk. 2.00/Tab.

FLURBIPROFEN

Indications: mild to moderate pain and inflammation in rheumatic disease and musculoskeletal disorders; dysmeno-rrhoea; migraine; sore throat; post-operative analgesia

Caution, Contra-indications and Side-effects: stomatitis; less commonly fatigue, paraesthesia, confusion and hallucination, *see notes above*

Dose: ADULT and CHILD over 12 years, 150-200 mg in 2-4 divided doses, max. 300 mg daily

Proprietary Preparation
Urbifen *(General),*Tab., 50mg Tk.5.02/Tab

IBUPROFEN[ED]

Indication: pain and inflammation in rheumatic diseases including juvenile chronic arthritis (JCA) and other musculoskeletal disorders; mild to moderate pain including dysmenorrhoea; fever and pain in children

Interactions: *see Appendix-2 (NSAIDs)*

Cautions; Contraindications; Side effects: *see notes above*

Dose: 1.2 to 1.6 g daily in 3-4 divided doses preferably after food; maximum dose permitted is 2.4 g daily; maintenance dose of 0.6-1.2 g daily may be adequate. CHILD 20 mg/kg daily in divided doses; maximal dose allowed is 40 mg/kg; not recommended for children under 7 kg

Proprietary Preparations
Advel *(Opsonin),* Susp., 100 mg/5 ml ; Tk. 25.35/100 ml;Tab., 400 mg**,** Tk. 1.08/Tab.
Alflam *(Albion),* Tab. , 400 mg , Tk.1.42/Tab.
Anaflam *(Asiatic),* Tab. , 400 mg, Tk. 1.43/Tab.
Arafa *(Hudson),* Tab., 400mg, Tk.1.00/Tab.
Bufen *(Drug Int),* SR Cap. , 300 mg, Tk. 4.05/Cap.
Flamex *(ACI),* SR Cap. , 300 mg , Tk. 4.00/Cap;. Tab. , 400 mg , Tk. 1.43/Tab.
Flamex*(ACI),* Susp., 100 mg/5 ml; Tk. 33.71/100ml
Flampen *(Alco),* Tab. , 400 mg, Tk. 1.30.Tab.
G-Ibuprofen *(Gonoshasthaya),* Tab., 400 mg**,** TK. 1.20/Tab.
Ibuprofen *(Albion),* Susp., 100 mg/5 ml, Tk.18.56/100 ml
Iburex *(Medimet),* Tab., 200mg, Tk.0.80/Tab.
Iburex *(Medimet),* Tab., 400mg, Tk.1.20/Tab.
Inflam *(Sanofi),* Tab., 400 mg, Tk. 1.42/Tab. ; Tab., 200 mg, Tk. 0.88/Tab.
Inflam-D *(Sanofi),* Tab., 200mg, Tk. 3.01/Tab.
Neurofen *(Globe),* Tab., 400 mg, Tk. 1.00/Tab.
Opsofen *(Opsonin),* Tab., 200 mg, Tk. 0.66/Tab.
Profen *(Acme),* Tab., 400 mg, Tk. 1.42/Tab.;Susp., 100 mg/5 ml ,Tk. 11.40/60 ml; Tk. 33.70/100 ml
Reumafen *(Beximco)*Susp., 100 mg/5 ml Tk. 33.71/100 ml ;Tab. , 200 mg, Tk. 1.40/Tab.; Tab. , 200 mg, Tk. 0.88/Tab.
Tab., 200 mg , Tk. 0.88/Tab.

INDOMETACIN

Indications: pain and moderate to severe inflammation in rheumatic diseases and other musculoskeletal disorders; acute gout, acute frozen shoulder, acute de Queirvain's disease of the wrist; dysmenorrhoea; closure of ductus arteriosus

Cautions & Contraindications: epilepsy, parkinsonism, psychiatric disturbances; dizziness may affect skilled task (e.g. driving); during prolonged therapy ophthalmic and blood examinations are particularly advisable; avoid rectal administration in proctitis and haemorrhoids, *see notes above*

Interactions: *see Appendix-2*

Side-effects: frequently gastrointestinal disturbances including diarrhoea, headache, dizziness and light headedness; gastrointestinal ulceration and bleeding; rarely, drowsiness, confusion, insomnia, convul-sions, psychiatric disturbance, blood disorders (particularly thrombocyto-penia);

suppositories may cause rectal irritation and occasional bleeding, *see notes above*

Dose: *by mouth,* rheumatic disease, 50-200 mg daily in divided doses, with food; CHILD not recommended. Acute gout, 150-200 mg daily in divided doses. Dysmenorrhoea, up to 75 mg daily

By rectum, in suppositories, 100 mg once or twice daily - not more than 3 days; total daily dose (suppositories alone or combined oral and suppository) max. 200 mg; CHILD not recommended

Proprietary Preparations

Imet *(Pacific),* Cap., 25 mg, Tk. 0.75/Cap.; SR Cap., 75 mg, Tk. 3.01/Cap.
Indo-A *(Acme),* Supp., 100 mg, Tk.7.02/Supp.
Indo *(Asiatic),* Cap., 25 mg, Tk. 0.60/Cap.
Indomet *(Opsonin),* Supp., 100 mg, Tk. 5.28/Supp.; Cap., 25 mg, Tk. 0.75/Cap.; SR Cap., 75 mg, Tk. 3.01/Cap.
Indomethacin *(Albion),* Cap., 25 mg, Tk. 0.60/Cap.
Indorex *(Medimet),* Cap. 25 mg, Tk. 1.00/Cap.
Indoxyl *(Jayson),* Cap., 25 mg, Tk. 0.63/Cap.
Reuma *(Aristo),* Cap., 25 mg, Tk. 1.00/Cap.; SR Cap., 75 mg, Tk. 4.00/Cap.; Supp., 100 mg, Tk. 9.00/Supp.
Servimeta *(Novartis),* Cap.,25 mg, Tk. 1.80/Cap.

KETOPROFEN

Indications: pain and mild inflammation in rheumatic diseases and other musculoskeletal disorders; after orthopaedic surgery; acute gout; dysmenorrhoea

Cautions; Contraindications; Side-effects: pain may occur at injection site (with occasional tissue damage); suppositories may cause rectal irritation; *see notes above*

Interactions: *see Appendix-2*

Dose: *by mouth*, in rheumatic disease, 100-200 mg in 2 divided doses with food; in pain and dysmenorrhoea 50 mg up to 3 times a day; CHILD not recommended

By rectum (in suppositories), rheumatic disease, 100 mg at bedtime; combined oral and rectal treatment, maximum total daily dose 200 mg; CHILD not recommended

By deep intramascular injection into the gluteal muscle, 50-100 mg every 6 hours (maximum 200 mg in 24 hours) for up to 3 days; CHILD not recommended

Proprietary Preparations

Kefen *(Techno),* Inj., 100 mg/2 ml , Tk. 15.00/amp.
Keto-A *(Acme),* Supp., 100 mg, Tk. 12.05/Supp.;Tab., 100 mg, Tk. 5.52/Tab.; 50 mg, Tk. 3.51/Tab.;Inj., 100 mg/ 2ml , Tk. 19.58/amp
Ketoprofen *(Albion),* Tab. , 100 mg, Tk. 6.00/Tab.; Tab. , 50 mg, Tk. 3.50/ Tab.
Ketron *(ACI),* SR Cap. , 100 mg , Tk. 7.03/Cap.
Keto-SR *(Hudson),* Cap. 100 mg, Tk. 7.00/Cap.
Kop *(Square),* Inj. , 100 mg/2 ml, Tk. 20.07/amp; Gel, 25 mg/gm, Tk. 58.21/20 gm SR Cap. , 100 mg, Tk. 7.02/Cap.; SR Cap. , 200 mg, Tk.10.04/Cap.;Tab. , 50 mg, Tk. 3.51/Tab.
Kynol *(Eskayef),* TR Cap., 100 mg, Tk 7.00/Cap. ;TR Cap., 200 mg, Tk. 10.00/Cap.
Orket *(Orion),* Inj., 100 mg/2 ml, Tk. 15.06/amp.
Profenid *(Sanofi),* CR Cap.,100 mg, Tk. 11.00/Cap.; CR Cap., 200 mg, Tk. 20.00/Cap.; Gel, 25 mg/gm, Tk. 120/30 gm
Inj., 100 mg/2 ml, Tk. 50.00/Amp. ;Tab., 100 mg, Tk. 9.00/Tab.;
Profenid-E *(Sanofi),* E.R Tab., 50 mg, Tk. 6.00/Tab.
TOP *(Biopharma),* Tab. , 100 mg, Tk. 6.02/Tab.; 50 mg, Tk. 3.51/Tab.
Topain *(Sonear),* Tab., 50 mg, Tk. 4.10/Tab.
Xynofen *(Beximco),* SR Cap., 100 mg, Tk. 7.54/Cap.

KETOROLAC

(see also 8.1.4.2)

Indications: short term management of moderate to severe acute postoperative pain

Cautions: reduce dose in elderly and in those weighing less than 50 kg; reduce dose and monitor in mild renal impairment; hepatic failure, cardiac impairment, cardiac decompensation, hypertension; peptic ulcer

Contraindications: history of hypersensitivity to aspirin, angioedema, asthma, complete or partial syndrome of nasal polyp; haemorrhagic diathesis, confirmed or suspected cerebro-vascular bleeding, moderate to severe renal

impairment; pregnancy and breast-feeding

Interactions:*see Appendix-2*

Side-effects: allergic reactions (including anaphylaxis), fluid retention, abdominal discomfort, dyspepsia, peptic ulceration, gastrointestinal bleeding, pancreatitis; mental and sensory changes, psychotic reactions, convulsions; palpitation, hypertension, bradycardia; purpura, thrombocytopenia, prolonged bleeding time; dyspnoea, pulmonary oedema; postoperative wound haemorrhage, haematoma, epistaxis; pain at injection site

Dose: *by mouth,* 10 mg every 4-6 hours (ELDERLY every 6-8 hours), max. dose 40 mg daily; max. duration of treatment 7 days

By intramuscular or intravenous injections over not less than 16 seconds, initially 30 mg, then 10-30 mg every 4-6 hours when required (every 2 hours in initial postoperative period. Max. dose 90 mg daily (ELDERLY and patients weighing less than 50 kg, max. 60 mg daily); max. duration of treatment 2 days; CHILD under 16 years, not recommended

Proprietary Preparations

Acupain *(Beacon),* Inj., 30 mg/ml, Tk. 55.20/amp.; Tab., 10 mg, Tk.10.00/Tab.
Analac *(Ziska),* Tab., 10 mg, Tk. 10.00/Tab.; Nasal Spray, 157.5 mg/1 ml, Tk. 120.00/5 ml; Inj., 30 mg/1 ml, Tk. 10.00/1 ml Amp.; 60 mg/2 ml, Tk. 96.00/2ml Amp.
Angesic *(White Horse),* Tab., 10 mg, Tk. 10.00/Tab.
Apilac *(APC),* Tab., 10 mg, Tk. 6.67/Tab.
Arolak *(Ambee) ,* Inj. , 30 mg/ml , Tk. 55.21/ml Amp; 10 mg/ml , Tk. 30.12/ml Amp; Tab., 10 mg , Tk. 10.04/Tab;
Emodol *(Jayson*Tab.,10 mg, Tk. 10.15/Tab;Inj., 30 mg/ml, Tk. 50.19/amp.
Etolac *(Ibn Sina),* Inj., 30 mg/ml, Tk. 55.21/amp.;60 mg/2 ml, Tk. 100.00/amp.;Tab. 10 mg, Tk. 10.50/Tab.
Etorac *(Incepta),* Inj., 30 mg/ml, Tk. 55.00/amp.; 60 mg/2 ml, Tk. 95.00/amp.; Tab.,10 mg, Tk. 10.00/Tab.
Kelac *(Chemist),* Tab., 10 mg, Tk. 10.00/Tab.; Inj., 30 mg, Tk. 50.00/ml Amp.
Kenodol *(Rangs),* Tab., 10mg, Tk. 12.00/Tab.; Inj., 30mg/ml, Tk. 50.00/ml Amp.
Ket *(Delta),* Inj., 30 mg/ml, Tk. 55.00/amp. ; Tab. , 10 mg, Tk. 10.00/Tab.
Keteks *(RAK),* Tab., 10 mg, Tk. 12.00/Tab.; Inj., 30 mg/ml, Tk. 55.0/amp.; 60 mg/2 ml, Tk. 95.0/amp.
Ketoact *(Leon),* Inj., 30 mg/ml, Tk. 55.00/amp.; Tab. , 10 mg, Tk. 10.00/Tab.
Ketobe *(Benham),* Tab. , 10 mg, Tk. 9.93/Tab.
Ketofast*(Veritas),* Inj., 60 mg/2 ml , Tk. 55.00/amp.;Tab., 10 mg, Tk. 12.00/Tab.
Ketofenac *(Doctor TIMS)* Tab.,10 mg,Tk. 10.00/Tab.
Ketoflex *(Somatec),* Tab. , 10 mg, Tk. 10.03/Tab.
Ketogate *(Pharmacil),* Inj., 30 mg/ml, Tk. 75.00/amp.
Ketolab *(Labaid),* Tab. , 10 mg, Tk. 12/Tab.
Ketonic *(Eskayef),* Tab, 10 mg, Tk. 10/Tab.; Inj., 30 mg/ml, Tk. 55.00/amp. ; 60 mg/2 ml, Tk. 95.00/amp.
Ketoprix *(Sharif),*Tab., 10 mg, Tk. 10.00/Tab.
Ketorin *(Orion),* Inj., 30 mg/1 ml, Tk. 55.00/amp.;Tab. ,10 mg, Tk. 10.04/Tab.
Ketoroz *(Astra),*Inj., 20 mg/ml, Tk. 55.00/amp.;Tab., 10 mg, Tk. 10.00/Tab.
Ketromin *(Pacific),* Tab., 10 mg, Tk.7.52/Tab.
Kflam *(Apex),* Inj., 30 mg/ml, Tk. 55.00/amp.; Tab. , 10 mg, Tk. 7.00/Tab.
Knil *(Rephco),* Tab. , 10 mg, Tk. 10.00/Tab.; Inj., 30 mg/ml, Tk. 60.00/amp. ; 60 mg/2 ml, Tk. 95.00/amp.
Korac *(Albion),* Tab. , 10 mg, Tk. 10.00/Tab.
KPR *(Central),* Tab. , 10 mg, Tk. 10.00/Tab.
Lacor *(Ad-din),* Tab., 10 mg, Tk. 9.00/Tab.
Lopadol *(Popular)*Inj., 30 mg/ml, Tk. 55.21/amp.; Inj., 60 mg/2 ml, Tk. 95.36/amp; Tab., 10 mg, Tk. 10.04/Tab.
Maxdol *(Concord),*Tab., 10 mg, Tk.10.00/Tab.
Minolac *(ACI),* Inj.,10 mg/ml , Tk. 33.00/amp.; Inj.,30 mg/ml , Tk. 55.21/amp.;60 mg/2 ml , Tk. 95.36/amp. Tab. , 10 mg, Tk. 10.40/Tab.
Ofpain *(Kemiko)*Tab. , 10 mg, Tk. 10.00/Tab.; Inj., 30 mg/ml, Tk. 55.00/amp.;60 mg/2 ml, Tk. 95.00/amp.
Oradol *(Aristo)*;Inj., 30 mg/1 ml, Tk. 55.00/amp.; 60 mg/2 ml, Tk. 95.00/amp. Tab. , 10 mg, Tk. 10.00/Tab.
ORC *(Navana),* Tab., 10 mg, Tk. 10.04/Tab.; Inj., 30 mg/ml, Tk. 49.00/amp.;Inj., 60 mg/2 ml, Tk. 50.00/amp.
Pair *(Drug Int),* Tab., 10 mg, Tk. 10.00/Tab.;Inj., 30 mg/ml, Tk. 55.00/Amp.
Perilac *(Biopharma),* Tab. , 10 mg, Tk. 11.00/Tab.; Inj., 10 mg/ml, Tk. 30.11/amp. ; 30 mg/ml, Tk. 55.21/Amp.; 60 mg/2 ml, Tk. 95.00/amp.
Repopain *(Organic),*Tab.,10 mg, Tk.10/Tab.
Roket *(Globe),* Tab., 10 mg, Tk. 10.00/Tab.; Inj., 60 mg/2 ml, Tk. 95.00/2 ml Amp.; 30 mg/ml, Tk. 55.00/ml Amp.

Rolac *(Renata),* Tab. , 10 mg, Tk. 10/Tab.; Inj., 10 mg ml, Tk. 32.13/amp.; 30 mg/ml, Tk. 55.21/amp.;60 mg/2 ml, Tk. 95.00/amp.
Romilac*(Techno),* Inj., 10 mgml, Tk. 33/amp.; 30 mg/ml, Tk. 56.00/amp.; 60 mg/2 ml, Tk 95.00/amp.;Tab. , 10 mg, Tk. 10.00/Tab.
Rotalac *(Pharmasia),* Inj., 30 mg/ml, Tk. 55.00/amp.; 60 mg/2 ml, Tk. 95.00/amp.; Tab. , 10 mg, Tk. 10.00/Tab.
Sanoket *(Sanofi),* Inj., 10 mg/ml, Tk. 30.11/amp. ;30 mg/ml, Tk. 55.21/amp. 60 mg/2 ml, Tk. 95.00/amp. Tab., 10 mg, Tk.10.00/Tab.
Surpim *(Asiatic),* Tab. , 10 mg, Tk.10/Tab. Tab., 10 mg, Tk.10.04/Tab.
Todol *(Opsonin),* Tab., 10 mg, Tk. 10.57/Tab. Inj., 30 mg/ml, Tk. 42.26/amp.;Inj., 60 mg/2 ml, Tk. 71.7/Amp.
Tolec *(Alco),* Tab. , 10 mg, Tk. 10.00/Tab.; Inj., 30 mg/ml, Tk. 55.00/amp.; 60 mg/2 ml, Tk. 95.00/amp.
Toradol *(Radiant),* Tab., 10 mg, Tk. 30.00/Tab.; Inj., 30 mg/ml, Tk. 130.00/Amp.
Toralin *(Nipro JMI),*Tab., 10 mg, Tk. 10.04/Tab.
Torax *(Square),* Inj.,10 mg/ml, Tk. 30.11/Amp.; Inj., 30 mg/ml, Tk. 55.21/Amp ; 60 mg/2 ml, Tk. 95.36/amp. Tab., 10 mg, Tk. 10.04/Tab.
Toroaid *(General),* Tab., 10 mg, Tk. 10.00/Tab. ; Inj., 30 mg/ml, Tk. 55.00/mp.; Inj., 60 mg/2 ml, Tk. 95.00/amp
Tram-K *(MST),* Tab., 10 mg, Tk. 10/Tab.
Troy *(Amico),* Tab. , 10 mg, Tk. 10.00/Tab.
Winop *(Acme),* Inj., 10 mg/ml, Tk. 30.11/Amp.; 30 mg/ml, Tk. 50.00/amp.; Inj., 60 mg/2 ml, Tk. 95.36/amp.
Xidolac *(Beximco),* Inj., 30 mg/ml, Tk. 55.00/amp.Tab.,10 mg, Tk. 10.00/Tab.
Zepac *(Novartis),* Inj., 30 mg/ml, Tk. 60.00/amp.; Tab., 10 mg, Tk. 10.00/Tab.
Zeropain *(Healthcare),* Inj., 30 mg/1 ml, Tk. 60.00/amp.;60 mg/2 ml, Tk. 100.00/amp.; Tab., 10 mg, Tk. 12.00/Tab.

MEFENAMIC ACID

Indications: mild to moderate pain in rheumatoid arthritis (including JCA), osteoarthritis, and related conditions; dysmenorrhoea and menorrhagia

Cautions; Contra-indications: also specifically contra-indicated in inflammatory bowel disease; porphyria; blood tests required during long term treatment, *see notes above*

Interactions: *see Appendix-2*

Side-effects: drowsiness, diarrhoea; thrombocytop-enia; haemolytic anaemia and aplastic anaemia have been reported; convulsion may occur with overdose, *see notes above*

Dose: ADULT over 18 years,500 mg 3 times daily preferably after food; CHILD 12-18 years, acute pain including dysmenorrheea, menorrhagia, 500 mg 3 times daily

Proprietary Preparations

Amifen *(Opsonin),* Tab., 500 mg, Tk. 3.77/Tab.; Susp., 50mg/5ml, Tk. 21.14/60ml
Dysmen *(Renata),* Tab., 250 mg, Tk. 2.80/Tab.; 500 mg, Tk. 5.00/Tab.
Fenamic *(Beximco),* Cap., 250 mg, Tk. 2.00/Cap.; 500 mg, Tk. 3.82/Cap.; Susp., 50 mg/5 ml, Tk. 15.00/60 ml
Fenaton *(Drug Intl),* Tab., 500 mg, Tk. 1.50/Tab.
Flamic *Globe),* Suspn., 50 mg/5 ml, Tk. 22.00/60 ml; Tab., 500 mg, Tk. 2.50/Tab.; 250 mg, Tk. 1.25/Tab.
HPR *(Pacific),* Tab., 250 mg, Tk. 2.26/Tab.; DS Tab., 500 mg, Tk. 4.44/Tab.; Susp., 50 mg/5 ml, Tk. 30.08/60 ml

MELOXICAM

Indications: pain and inflammation in rheumatic diseases, ankylosing spondylitis, acute exacerbations of osteoarthritis (short term management)

Cautions; Contra-indications & Side-effects: avoid rectal administration in patients with haemor-rhoids; *see also notes above*

Interactions: *see Appendix-2*

Dose: *by mouth,* osteoarthritis, 7.5 mg once daily with food, increased to 15 mg once daily if necessary. Rheumatoid arthritis and ankylosing spondylitis, 15 mg once daily with food (7.5 mg in elderly)
By rectum, in suppository, rheumatoid arthritis, 15 mg once daily (7.5 mg in elderly); ankylosing spondylitis, 15 mg once daily
Child under15 years not recommended

Proprietary Preparations

Melcam *(Square),* Tab.15mg, Tk.4.01/Tab.; 7.5mg, Tk. 2.51/Tab.

NAPROXEN

Indications: pain and inflammation in rheumatic disease (including JCA), advanced osteoarthritis and other musculoskeletal disorders; dysmenorrhoea, acute gout

Interactions: *see Appendix-2*

Cautions; Contraindications and Side-effects: *see notes above*

Dose: *by mouth,* 0.5-1 g daily in 2 divided doses; CHILD over 5 years, for JCA, 10 mg/kg daily in 2 divided doses. Acute musculoskeletal disorders and dysmenorrhoea, 500 mg initially, then 250 mg every 6-8 hours as required; max. dose after first day 1.25 g daily; CHILD under 16 years not recommended. Acute gout, 750 mg initially, then 250 mg every 8 hours until attack has passed

Proprietary Preparations

Anaflex *(ACI),* Gel, 10%, Tk. 62.23/15 gm; Tk. 116.00/30 gm;Tab. , 250 mg , Tk. 5.02/Tab. ;Tab. , 500 mg , Tk. 9.03/Tab.;SR Tab. , 500 mg , Tk. 14.05/Tab.
Diproxen *(Drug Int.),* Tab. , 250 mg, Tk. 4.25/Tab. ;Tab. , 500 mg, Tk. 7.00/Tab. ;CR Tab. , 500 mg, Tk. 10.00/Tab. **;**Gel , 10%, Tk. 60.00/15 gm
Fritt *(Somatec),* Tab. , 250 mg , Tk. 4.01/Tab.; 500 mg, Tk. 7.03/Tab.;
Gloxen *(Globe),* Tab., 500 mg, Tk. 7.00/Tab.; Tab., 250 mg, Tk. 4.00/Tab.
H-Nap *(Hudson),* Tab., 500 mg, Tk.8.00/Tab.
Makproxen *(Maks),* Tab. , 500 mg, Tk. 8.00/Tab.
Naid *(Pacific),* Tab., 250 mg, Tk. 3.01/Tab.; 500 mg, Tk. 5.65/Tab.
Napier *(Concord),* Tab. , 500 mg, Tk. 7.00/Tab.
Napren *(Alco),* Tab. , 250 mg, Tk. 5.00/Tab.; 500 mg, Tk. 9.00/Tab.;
Napro *(Aristo),* Tab. , 250 mg, Tk. 4.20/Tab.; 500 mg, Tk. 7.00/Tab.
Napro-A *(Acme),* Tab., 250 mg, Tk. 4.01/Tab.;500 mg, Tk. 7.02/Tab.
Naproben *(Benham),* Tab., 500 mg, Tk. 7.00/Tab.
Napronil *(Pharmasia),* Tab, 500 mg, Tk. 7.00/Tab.
Napropain *(RAK),* Tab., 250 mg, Tk. 6.00/Tab.; 500 mg, Tk. 8.0/Tab.
Naproson *(Jayson),* Tab. ,250 mg, Tk. 4.06/Tab.; 500 mg, Tk. 7.03/Tab.
Naprosyn *(Radiant),* Susp., 125 mg/5 ml, Tk. 120.00/50 ml.;Tab. , 250 mg, Tk. 8.00/Tab.; 500 mg, Tk. 15.00/Tab.
Naprox *(Eskayef),* Gel, 10%,, Tk. 60.00/15 gm; Tab., 250 mg, Tk. 5.00/Tab.; 500 mg, Tk. 9.00/Tab. Susp., 125mg/5ml, Tk. 50.00/50 ml
Naproxen *(Albion),* Tab. , 250 mg, Tk. 4.00/Tab.; 500 mg, Tk. 6.89/Tab.
Naproxen *(Amico),* Tab., 500 mg, Tk. 7.00/Tab.
Naproxen *(Organic),* Tab. , 500 mg, Tk.7.00/Tab.
Naproxin *(Ambee) ,* Tab., 500 mg, Tk. 6.92/Tab
Napryn *(Healthcare),* Tab., 250 mg, Tk. 7.00/Tab.; 500 mg, Tk. 11.00/Tab.;Gel,10%, Tk. 70.0015 gm .;Susp., 125mg/5ml, Tk. 90.00/50 ml
Napsod *(Unimed),* Tab. , 250 mg, Tk. 5.00/Tab.;Tab. , 500 mg, Tk. 9.00/Tab.
Naspro *(Popular),*Tab. , 250 mg, Tk. 5.02/Tab. ;500 mg, Tk. 9.03/Tab.
Naxin *(Opsonin),* Tab., 250 mg, Tk 3.76/Tab.;Tab., 500 mg, Tk. 6.77/Tab.
Naxo *(Navana),* Tab., 500 mg, Tk. 8.00/Tab.; 250 mg, Tk. 4.02/Tab.
Nipoxen *(Nipro JMI),* Tab. , 250 mg, Tk. 5/Tab.; SR Tab. , 500 mg, Tk. 14/Tab.
Novaxen *(Leon),* Tab. , 500 mg, Tk. 8/Tab.
Noze *(MST),* Tab., 500 mg, TK. 7.00/Tab.
Nuprafen *(Beximco),* Tab. , 250 mg, Tk. 4.20/Tab.; 500 mg, Tk. 7.85/Tab.
Nupralgin *(Ibn Sina),* Tab. , 250 mg, Tk. 5.00/Tab.; 500 mg, Tk. 9.00/Tab.
Pairox *(Asiatic),* Tab. , 250 mg , Tk. 5.00/Tab.; 500 mg, Tk. 8.00/Tab.
Ranoxen *(Rangs),* Tab., 250 mg, Tk. 4.00/Tab.; Tab., 500 mg, Tk. 7.00/Tab.
Releve *(General,),* Tab. , 500 mg, Tk. 9.03/Tab.
Servinaprox*(Novartis),* Tab. , 250 mg, Tk. 7.00/Tab.; 500 mg, Tk. 12.00/Tab.
Sonap *(Square),* Gel, 10%, Tk. 60.22/15 gm.; Tab. , 250 mg, Tk. 4.01/Tab. 500 mg, Tk. 7.02/Tab. ;Supp, 500 mg, Tk. 12.05/supp. Susp., 125mg/5ml, Tk. 35.00/50 ml
Ticoflex *(Incepta),* Tab. , 250 mg, Tk. 4.00/Tab., 500 mg, Tk. 7.00/Tab.; Gel, 10%, Tk. 60.00/15 gm.; SR Tab. , 500 mg, Tk. 8.00/Tab.
Tofa *(Kemiko),* Tab. , 250 mg, Tk. 4.00/Tab.; Tab. , 500 mg, Tk. 8.00/Tab.
Ultranax *(Ad-din),* Tab., 500 mg, Tk. 8.00/Tab.
Xenapro *(Renata),* Tab. , 250 mg , Tl. 5.00/Tab.; 500 mg, Tk. 8.03/Tab.
Xpro *(Apex),* Tab. , 500 mg, Tk. 7.00/Tab.
Zenosyn *(Sharif),* Tab. , 500 mg, Tk. 7.00/Tab.

Esomeprazole + Naproxen BP

Anaflex Max *(ACI),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
DemovoTM *(Delta),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ; 20 mg + 500 mg, Tk. 10.00/Tab.
Dinovo,(*Beximco)*Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ;20 mg + 500 mg, Tk. 10.00/Tab.
Esona *(Navana),* Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Esoxen *(Organic),* Tab. , Tk. 8.00/Tab. ;20 mg + 500 mg, Tk. 10.00/Tab.
Inflect,*(Kemiko),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ;Tab. , 20 mg + 500 mg, Tk. 10.00/Tab.
Locin*(Globe),* Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Nameso *(Opsonin),* Tab., 20 mg + 375 mg, Tk. 6.02/Tab.; 20 mg + 500 mg, Tk. 7.52/Tab.
Napren ES *(Alco),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ; 20 mg + 500 mg, Tk. 10.00/Tab.
Napro-A Plus *(Acme),* Tab.,Tk. 8.00/Tab.;20 mg + 500 mg, Tk. 10.00/Tab.
Naproflex *(Somatec),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ; Tab. , 20 mg + 500 mg, Tk. 10.00/Tab.
Naprosyn Plus *(Radiant),* Tab. , 20 mg + 500 mg, Tk. 20.00/Tab.
Naprotec *(Sharif),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Naprox Plus , *(Eskayef),* Tab, 20 mg + 375 mg, Tk. 8.00/Tab.; Tab, 20 mg + 500 mg, Tk. 10.00/Tab.
Naproxen Plus *(Albion),* Tab. , 20 mg + 500 mg, Tk. 6.89/Tab.
Naprozol *(General),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.;Tab. , 20 mg + 500 mg , Tk. 10.00/Tab.
Napsec *(Drug Int),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ; Tab. , 20 mg + 500 mg, Tk. 10.00/Tab.
Nasopain *(RAK),* Tab., 20 mg + 375 mg, Tk. 10.0/Tab.; 20 mg + 500 mg, Tk. 12.0/Tab.
Neso *(Aristo),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ;20 mg + 500 mg, Tk. 10.00/Tab.
Novaxen Plus *(Leon),* Tab. , 20 mg + 500 mg, Tk. 10.00/Tab.
Novoxen *(Orion),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ; 20 mg + 500 mg, Tk. 10.00/Tab.
Nupralgin Plus *(Ibn Sina),* Tab. , 20 mg + 500 mg, Tk. 10.00/Tab. ; 20 mg + 375 mg, Tk. 8.00/Tab.
Progesic *(Incepta),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ; 20 mg + 500 mg, Tk. 10.00/Tab.
Progut-N *(Popular),* Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Solivo *(Healthcare),* Tab., 20 mg + 375 mg, Tk. 13.00/Tab. ;, 20 mg + 500 mg, Tk. 15.00/Tab.
Xenole *(Square),* Tab. , 20 mg + 375 mg, Tk. 8.00//Tab.; 20 mg + 500

PIROXICAM

Indications: pain and inflammation of rheumatic diseases (including JCA) and other musculoskeletal disorders; acute gout

Cautions & Contraindications: *see notes above*

Interactions: *see Appendix-2*

Side-effects: pain may occur at injection site (occasional tissue damage), *see notes above*

Dose: *by mouth,* rheumatic disease, initially 20 mg daily, maintenance 10-30 mg daily in single dose. CHILD over 6 years, JCA, less than 15 kg, 5 mg daily; 16-25 mg or divided per kg, 10 mg; 26-45 kg, 15 mg; over 45 kg, 20 mg. Acute musculoskeletal disorders, 40 mg daily in single or twice daily doses for 2 days, then 20 mg daily for 7-14 days; CHILD not recommended. Acute gout, 40 mg initially, then 40 mg daily in single or divided doses for 4-6 days; CHILD not recommended

By deep intramuscular injection into gluteal muscle, for initial treatment of acute conditions, as dose by mouth (on short-term basis); CHILD not recommended

Proprietary Preparations
Flexicam *(Renata*) Cap.,10mg, Tk.1.67/Cap.
Inj. 40mg/2ml, Tk.14.67/amp.
Rheudene *(Gaco),* Cap 10mg, Tk.1.75/Cap.
Inj. 40mg/2ml, Tk.14.67/amp.

SULINDAC

Indications:pain and inflammation in rheumatic disease and other musculo-skeletal disorders; acute gout
Cautions; Contra-indications: *see notes above;* history of renal stones; ensure adequate hydration
Side-effects: fever, jaundice, cholestasis, hepatitis; urine discoloration
Dose: 200 mg twice daily (may be reduced according to response); max.

400 mg daily; limit treatment to 7-10 days; CHILD not recommended

Proprietary preparations
Clinorel*(Opsonin),* Tab., 100 mg, Tk. 3.76/Tab.;Tab., 200 mg, Tk. 7.17/Tab.
Lindac *(Popular),* Tab., 100mg, Tk. 5.02/Tab.; 200mg, Tk. 9.54/Tab.
Sulidac *(Eskayef),* Tab, 100mg, Tk. 5.00/Tab.

TENOXICAM

Indications: pain and inflammation in rheumatic diseases and other musculoskeletal disorders

Cautions; Contraindications & Side-effects: *see notes above*

Interactions: *see Appendix-2*
Dose: *by mouth,* rheumatic disease, 20 mg daily; CHILD not recommended. Acute musculoskeletal disorders, 20 mg daily for 7 days; max. 14 days; CHILD not recommended
By intramuscular or intravenous injection, for initial treatment for 1-2 days, as dose by mouth; CHILD not recommended

Proprietary Preparation
Enocam *(Acme),* Tab., 20 mg, Tk. 8/Tab.
Inoten *(Opsonin),* Tab., 20 mg, Tk. 6.04/Tab.
Mobicam *(Beximco),* Tab., 20mg,Tk. 8/Tab.
Oxicam *(ACI),* Tab., 20 mg , Tk. 8.03/Tab.
Oxiflam *(Ibn Sina),* Tab., 20 mg, Tk. 8/Tab.
Tenoflex *(Beacon),* Tab., 20 mg,Tk. 8/Tab.
Tenopain *(Incepta),* Tab., 20 mg, Tk. 8/Tab.
Tenorix *(Orion),* Tab., 20 mg, Tk. 8.03/Tab.
Texicam *(Apex),* Tab., 20 mg, Tk. 8/Tab.
Tilkotil *(Radiant),* Tab. , 20 mg, Tk. 17.01/Tab.
Xicotil *(Aristo),* Tab. , 20 mg, Tk. 8.00/Tab.
Xten*(Square),* Tab. , 20 mg, Tk. 8.00/Tab.

TOLMETIN

Indications: pain and inflammation in rheumatic diseases (including JCA) and other musculoskeletal disorders

Cautions; Contraindications & Side-effects: *see notes above*

Interactions: *see Appendix-2*

Dose: 0.6-1.8 g daily in 2-4 divided doses; max. 30 mg/kg daily up to 1.8 g; CHILD, JCA, 20-25 mg/kg daily in 3-4 divided doses;max.30mg/kg upto1.8 g.

Generic Preparation
Capsule, 200mg, 400mg

9.1.2 CORTICOSTEROIDS

9.1.2.1 SYSTEMIC CORTICOSTEROIDS
9.1.2.2 LOCAL CORTICOSTEROIDS

9.1.2.1 SYSTEMIC CORTICOSTEROIDS

(see also section 5.3.2)

The use of corticosteroids in rheumatic disease should be restricted to short term management of an acute exacerbation (to tide over the crisis) and for long term management when other drugs fail. In severe life threatening conditions a high initial dose of systemic steroid is given to induce remission. Thereafter the dose is gradually tapered to the lowest possible maintenance dose, or withdrawn altogether, if possible. Pulse dose of corticosteroids (for example- methylprednisolone sodium succinate, up to 1 g intra-venously on consecutive three days) is in current use to suppress highly inflammatory disease while longer term and slower acting medication is being commenced.Prolonged use of corticosteroids can induce osteoporosis, therefore prophylaxis should be considered in this situation.

Prednisolone is the standard oral steroid preparation for use in rheumatic disease. It permits finer dosage adjustment and therefore is advantageous over the more potent steroids. To manage severe inflammatory conditions in rheumatoid arthritis a high initial dose of prednisolone, e.g. 80 mg daily in divided doses, should be administered and this should be rapidly tapered to total withdrawal or a minimum maintenance dose. To minimize side-effects the maintenance dose of prednisolone

should be kept as low as possible, e.g. 5 mg daily or on alternate days.
Recent evidence has suggested that prednisolone 7.5 mg daily may substantially reduce the rate of joint destruction in moderate to severe rheumatoid arthritis of less than 2 years duration. Care should be taken not to increase the equivalent of prednisolone 7.5 mg daily. Current evidence supports maintenance of this anti-erosive dose for 2-4 years only to avoid possible long-term adverse effects. After that, treatment should be tapered off.
Polimyalgia rheumatica should always be treated with corticosteroids. The initial dose of prednisolone in polimyalgia rheumatica is 10 to 15 mg daily. Treatment should be continued until remission of disease activity. Thereafter the dose should be gradually reduced to a maintenance dose of about 7.5 mg and this may be continued up to 3 to 6 years. Relapse is common if therapy is stopped within 3 years.
Giant cell (temporal) arteritis, polyarteritis nodosa and polymyositis should be treated with an initial dose of 40-60 mg prednisolone daily and reduced to a maintenance dose of 7.5 to 10 mg daily after remission.
Ankylosing spondylitis should not be treated with long-term corticosteroids. Pulse doses may rarely be required to control active disease that does not respond to conventional treatment.

Dexamethasone and **Betamethasone** may be used alternatively for systemic oral therapy. They have very high glucocorticoid activity in conjunction with insignificant mineralocorticoid activity, and are long acting drugs- suitable for prolonged therapy.

BETAMETHASONE[ED]

Indications: cerebral oedema, suppression of inflammatory and allergic disorders, rheumatic disease; diagnosis of Cushing's disease, congenital adrenal hyperplasia

Cautions; Contraindications; Side-effects: *see notes above under Prednisolone*

Dose: 0.5-5 mg daily by mouth

Proprietary Preparations
see section 5.3.2

DEXAMETHASONE[ED]

Indications: shock, cerebral oedema, suppression of inflammatory and allergic disorders, rheumatic diseases; diagnosis of Cushing's disease, congenital adrenal hyperplasia

Cautions: Contraindications; Side-effects: *see notes above under Prednisolone*; perineal irritation may follow intravenous administration of phosphate ester

Dose:*by mouth,* 0.5-10 mg daily, precautions same as for Prednisolone

By intramuscular or slow intravenous injection (as dexamethasone phosphate), initially 0.5-20 mg; CHILD 200-500 microgram/kg daily

Proprietary Preparations
see section 5.3.2

PREDNISOLONE[ED]

Indications: rheumatic diseases, not controlled by NSAIDs; suppression of inflammatory and allergic disorders; inflammatory bowel disorders; immuno-suppression

Cautions: adrenal suppression, infection, growth retardation in children and adolescents, peptic ulceration, diabetes mellitus, pregnancy and breast feeding; special precautions needs to be observed in elderly (side effects more serious), in those with history of tuberculosis (reactivation of tuberculosis is possible), in osteoporosis (post-menopausal women at special risk). Monitoring is required in hypertension, congestive heart failure, recent myocardial infarction, liver failure, renal impairment and glaucoma

Contraindications: systemic infection (unless specific antimicrobial therapy given); avoid live virus vaccine (serum antibody response diminished)

Side-effects: musculoskeletal effects include proximal myopathy, osteoporosis, vertebral and long bone fractures, avascular necrosis, tendon rapture; for other side-effects *see under endocrine section*

Dose:*by mouth,* initially 15-30 mg daily in divided doses (up to 80 mg daily in severe cases), should be taken after meals and preferably covered by an H_2 blocker drug (e.g. ranitidine). The dose should be tapered rapidly to a maintenance as low as possible (e.g. 5 mg daily). *See notes above*

*By intramuscular injection,*methylprednisolone acetate, 25-100 mg repeated after 2-3 weeks

By intravenous injection, methylprednisolone sodium sodium succinate, slow intravenous injection or infusion, up to 1 gm for not more than three days

Proprietary Preparations
see section 5.3.2

9.1.2.2 LOCAL CORTICOSTEROIDS

Local corticosteroid injections have an important role in managing inflamed joints and tendon sheaths. In selected cases, these long acting local steroid preparations are injected intra-articularly or into the sinuvial sheaths. In rheumatoid arthritis, they are given by intra-articular injections to relieve pain, increase mobility, and reduce deformity in one or a few joints. In smaller amounts corticosteroids may also be injected directly into soft tissues for relief of inflammation in conditions such as tennis elbow or golfer's elbow or compressive neuropathies. In tendinitis, injections should be made into the tendon sheath and not directly into the tendon, otherwise rupture of tendon may happen.Due to the absence of a true tendon sheath and a high risk of rapture, the Achilles tendon should not be injected.

Full aseptic preparations are essential. Corticosteroid injections are contra-indicated in infected areas. Occasionally an acute inflammatory reaction develops after an intra-articular or soft-tissue injection of a corticosteroid. This is possibly a reaction to the microcrystalline suspension of the corticosteroid used. However, one must be cautious that sepsis has not been introduced into the injection site. Intra-articular corticosteroid injections can cause flushing and may affect the hyaline articular cartilage. Charcot-like arthropathies have also been reported (particularly following repeated intra-articular injections). Intra-articular injection of corticosteroids to one single joint should not exceed 4 times in one year.

Methylprednisolone, dexamethasone sodium phosphate, and triamcinolone acetonide are useful local corticosteroid preparations.

LOCAL CORTICOSTEROID INJECTIONS

Indications: local inflammation of joints due to rheumatoid arthritis or advanced osteoarthritis; stenosing tenovaginitis (e.g. de Quervain's disease of the wrist); overuse injury (e.g. tennis elbow); compressive neuropathies (e.g. carpal tunnel syndrome).

Cautions; Contraindications & Side-effects: *see notes above*

Dose: *see under preparations (section 5.3.2)*

9.1.3 DISEASE-MODIFYING ANTI-RHEUMATIC DRUGS (DMARD)

These are drugs, which have the capacity to modify the clinical and pathological course of rheumatoid arthritis and a few related disorders. Prolonged administration is required and the effects are slow to appear. These drugs require 4 to 6 months of treatment

for a full response. If one of these drugs does not lead to objective benefit within 6 months, it should be discontinued and another may be tried.

DMARDs may improve symptoms and signs of inflammatory joint disease and also extra-articular manifestations such as vasculitis. They reduce the erythrocyte sedimentation rate, and sometimes the titre of rheumatoid factor.

These drugs are indicated in rheumatoid arthritis when NSAIDs alone fail to provide adequate control. Some rheumatologists would administer these drugs early in case of clinically severe rheumatoid arthritis. As all these drugs have potentially serious side-effects they should be administered with caution, preferably by specialists only. Frequent monitoring of patients is required.

CHOICE: When choosing among the DMARDs, chloroquine, hydroxychloroquine or sulpfasalazine can be the first choice as they have the minimum adverse reactions among the group. Methotrexate is more efficacious, and is preferable in managing severe inflammatory conditions. When quinines, sulphasalazine or methotrexate are ineffective, leflunomide should be tried. Injectable gold salt (sodium aurothiomalate), penicillamine, azathioprine and cyclosporin are alternatives.

Chloroquine and hydroxychlroquine have a very acceptable toxicity profile. Retinopathy is rare if the dose recommended below is not exceeded. It is particularly effective in the early treatment of mild to moderate and/or seronegative rheumatoid arthritis. However, this drug should not be used in psoriatic arthritis.

Sulphasalazine shares many attributes with chloroquine. It has an acceptable toxicity profile and is recommended for early mild rheumatoid arthritis. Side effects include rash, gastro-intestinal intolerance and, especially in patients with rheumatoid arthritis, occasional leucopenia, neutropenia, and thrombocytopenia. These haematological changes occur usually during the first 6 months of treatment. Close monitoring of blood counts is indicated during the first 2 months and 6 weekly thereafter. Liver function tests should also be done at 6 weekly intervals.

Methotrexate is an immunosuppressant drug used by rheumatologists widely to control severe rheumatoid arthritis nowadays. Long-term clinical studies have clearly demonstrated the efficacy and safety of this drug. The use of folic acid reduces the incidence of common side effects, especially gastrointestinal toxicity, without decreasing the effectiveness of methotrexate. Regular blood counts and liver function tests should be done during the therapy (at 4-6 weekly intervals), but liver biopsy is not required unless a persistent abnormality of liver function is demonstrated.

Sodium aurothiomalate must be given by deep intramascular injection and the area gently massaged. A test dose of 10 mg must be given followed by doses of 50 mg at weekly until there is definite evidence of remission. Benefit is not to be expected until about 300 mg has been given. If no improvement is apparent after 1 g has been administered, this drug should be discontinued. If there is response, the interval between the doses should be gradually increased to 4 weeks. The treatment should be continued up to 5 years after complete remission. If relapse occurs, dosage may be immediately increased to 50 mg weekly and once control has been obtained the dosage should be gradually decreased.

Gold therapy should be discontinued in presence of blood disorders or proteinuria. Urine tests and full blood counts must be performed before each injection. Rash and pruritus (which often occur after 2-6 months of injection treatment) may necessitate discontinuation of treatment.

Penicillamine has an action similar to sodium aurothiomalate but side-effects occur more frequently. Penicillamine should be discontinued if there is no improvement in one year. Improvement is expected from 6 to 12 weeks after treatment is initiated. If remission has

been sustained for 6 months, gradual reduction of dose every 12 weeks may be attempted.

Blood counts and urine examinations should be carried out every 1 or 2 weeks for the first 2 months, then every 4 weeks to detect blood disorders or proteinuria. A reduction of platelet count calls for discontinuation of treatment followed by re-introduction at a lower dose and gradual increase of dose under close monitoring.

Azathioprine may be chosen when chloroquine, penicillamine or gold fails to produce a favorable response. Blood counts are required to detect possible neutropenia or thrombocytopenia. Gastro-intestinal upsets may occur-particularly at the start of the treatment; herpes zoster infection may also occur *(see also section 14.2)*.

Cyclosporine is also effective and is now indicated for severe active rheumatoid arthritis when conventional treatment fails. There is some evidence that cyclosporine retards the rate of erosive progression.

Leflunomide is useful in moderate to severe rheumatoid arthritis. It is an immunosuppressant drug and requires frequent monitoring of haematological, renal and hepatic functions. Pregnancy must be excluded before initiating treatment, and effective contraception is essential during treatment and at least for 2 years after treatment in women and at least for 3 months after treatment in men.

AZATHIOPRINE

Indications: *see notes above*; transplantation rejection

Cautions; Contraindications; Side-effects: *see in section on cytotoxic drugs*

Dose: *by mouth*, initially 3 mg/kg daily, reduced according to response; maintenance dose 1-3 mg/kg daily: withdraw treatment if no improvement is apparent in 3 months

Proprietary Preparations
see section 14.2.1

CHLOROQUINE[ED]

Indications: active rheumatoid arthritis, juvenile chronic arthritis; systemic and discoid lupus erythematosus; malaria *(see also section 1.4.1)*

Cautions: hepatic and renal impairment, pregnancy, porphyria, psoriasis, epilepsy, myasthenia gravis, severe gastro-intestinal disorders, G6PD deficiency and elderly. A baseline eye examination should be done before starting long-term therapy with chloroquine, and eye examination should be repeated every 6 months. Patients are advised to stop taking the drug and seek immediate advice of ophthalmologist if any disturbance of vision occurs. Ocular toxicity is very unlikely with chloroquine phosphate not exceeding 4 mg/kg daily

Side-effects : gastro-intestinal disturbances, headache, visual disturbance; convulsions, irreversible retinal damage, corneal opacities; skin reactions (depigmentation, alopecia, rashes, pruritus); rarely blood disorders (thrombocytopenia, agranulocytosis, aplastic anaemia), also psychosis has been reported

Dose: chloroquine base 150 mg daily; maximum 2.5 mg/kg daily; CHILD, up to 3 mg/kg daily; *see recommendations above*

Proprietary Preparations
see section 1.4.1

CYCLOSPORINE

(see section 14.2.1)

Indications: severe active rheumatoid arthritis when conventional therapy inappropriate or ineffective; graft-versus-host disease; atopic dermatitis and psoriasis

Cautions; Contraindications & Side-effects: *see in section on cytotoxic*

drugs (section 14.1.2.) Additional cautions in rheumatoid arthritis

Contraindication: in abnormal renal function, hypertension not under control, infections not under control, and malignancy. Serum creatinine needs to be measured initially before treatment, and monitored every 2 weeks for the first 3 months, and thereafter every 4 weeks

Dose: ADULT over 18 years by mouth, administered in accordance with expert advice, 2.5 mg/kg daily in 2 divided doses initially, then increased if necessary after 6 weeks to max. 4 mg/kg daily; treatment should be discontinued if the response is insufficient in 3 months; dose should be adjusted according to the response and should be reviewed in 6 months and treatment should be continued only if benefits are clearly outweigh risks. CHILD and under 18 years, not recommended

Proprietary Preparations
see section 14.2.2

HYDROXYCHLOROQUINE

Indications: active rheumatoid arthritis (including juvenile chronic arthritis), systemic and discoid lupus erythematosus

Cautions; Side-effects: *see notes above*

Dose: Initially 400 mg daily in divided doses; maintenance dose 200-400 mg daily; maximum dose 6.5 mg/kg, but not exceeding 400 mg daily. CHILD, up to 6.5 mg/kg daily

Proprietary Preparation
Reconil *(Incepta),* Tab.200 mg, Tk.12/Tab.

LEFLUNOMIDE

Indications: moderate to severe active rheumatoid arthritis

Cautions: renal impairment; impaired bone marrow function including anaemia, leucopenia or thrombo-cytopenia; recent treatment with other hepatotoxic or myelotoxic DMARD (avoid concomitant use); history of tuberculosis; exclude pregnancy before treatment. Monitor full blood count before treatment and every 2 weeks for 6 months then every 8 weeks. Monitor liver function. Monitor blood pressure

Contraindications: severe immuno-deficiency; severe infections; hepatic impairment; severe hypoproteinemia; pregnancy

Side-effects: diarrhoea, nausea, vomi-ting, anorexia, oral mucosal disorders, abdominal pain, weight loss; increased blood pressure; headache, dizziness, paraesthesia, asthenia; dry skin, rash, pruritus, eczema, alopecia; tenosinuvitis; leucopenia, thrombocytopenia, anaemia; hepatic dysfunction; severe infection, anaphylaxis

Dose: initially 100 mg for 3 days, then maintenance, 10-20 mg daily; CHILD under 18 years safety and efficacy not established

Proprietary Preparations
Motoral *(ACI),* Tab. , 20 mg , Tk. 5.02/Tab.; 100 mg , Tk. 20.07/Tab.
Nodia *(Incepta),* Tab. , 100 mg, Tk. 20/Tab.; 10 mg, Tk. 3/Tab.

METHOTREXATE[ED]

Indications: severe active rheumatoid arthritis; malignant disease

Cautions; Contraindications & Side-effects: *see notes above and also the section on anti-neoplastic drugs (section 14.1.3)*. pulmonary toxicity may be a special problem in rheumatoid arthritis. Patients on methotrexate are advised to contact doctor immediately if he or she develops dyspnoea or cough

Dose:*by mouth,* 7.5 mg once weekly (in a single dose, or divided doses of 2.5 mg at intervals of 12 hours – to be adjusted according to response). Total maximum dose is 20 mg weekly

Proprietary Preparations
see section 14.1.3

SULFASALAZINE

Indications: active rheumatoid arthritis; also ulcerative colitis; *see notes above also section 2.5*

Cautions; Contraindications & Side-effects: *see notes above*. Patients receiving sulphasalazine should be advised to report any unexplained bleeding, bruising, purpura, sore throat, fever or malaise that occurs during treatment

Dose: administered on expert advice, as enteric-coated tablets, initially 500 mg daily, increased by 500 mg daily at intervals of 1 week to a maximum of 2 – 3 g daily in divided doses

Proprietary Preparations
Reumazin *(Aristo),* Tab. , 500 mg, Tk. 5.20/Tab.
Sulfazin *(Popular),* Tab. , 500 mg, Tk. 5.22/Tab.
Sulfacol *(Drug Int.),* Tab. , 500 mg, Tk. 5.00/Tab.
Salazine *(Opsonin),* Supp., 500 mg, Tk. 7.52/Supp.;Tab., 500 mg, Tk. 3.92/Tab.

9.1.4 DRUGS FOR TREATMENT OF GOUT

Drugs used for treatment of acute attack of gout are different from those used in long term control (interval treatment) of the disease. The latter should not be initiated during an acute attack, because this may exacerbate and prolong the acute manifestations of the disease.

ACUTE ATTACKS: High doses of NSAIDs with strong anti-inflammatory effects are used to control an acute attack of gout. Indomethacin 150-200 mg in divided doses (orally or in suppositories) is a good choice. Diclofenac, naproxen or piroxicam are alternatives. Aspirin is not indicated in acute gout. Colchicine is probably as effective as NSAIDs. It may develop toxicity at higher doses, but is advantageous for heart failure patients, as it does not induce fluid retention. Also, it does not have drug interactions with anticoagulants. *See NSAIDs.*

Colchicine is useful in controlling pain and inflammation in acute gout.

COLCHICINE

Indications: acute gout; short term prophylaxis during initial therapy with allopurinol or uricosuric drugs

Cautions: *see* notes above; gastro-intestinal disease; cardiac disease; renal impairment; elderly

Contra-indications: blood disorders

Side-effects: nausea, vomiting, abdo-minal pain, profuse diarrhoea, gastro-intestinal bleeding, rash, hepatic and renal damage

Dose: Acute gout- 0.5/0.6 mg 2-4 times daily until symptoms are relieved, max. 6 mg per course; course not be repeated in 3 days

Prevention of gout attack- during initial treatment with allopurinol or uricosuric drugs, 0.5 mg twice daily

Proprietary Preparations
Kolchin *(Incepta),* Tab., 0.5 mg, Tk. 4/Tab.; 0.6 mg, Tk. 5/Tab.
Coluric *(Unimed),* Tab., 0.6 mg, Tk. 7.50/Tab.

INTERVAL TREATMENT: Reducing uric acid formation from purines with xanthine-oxydase inhibitor allopurinol and febuxostat can do long term control (interval treatment) of gout. Alternatively, uric acid excretion can be increased by using uricosuric a drug such as sulfinpyrazone. Treatment with these drugs should not be initiated during an acute attack. Even in quiescent stage, initiation of interval treatment may precipitate an acute attack of gout. Therefore, when starting the interval treatment, a potent NSAID or colchicine should be administered side by side, and should be continued for about one month after the hyperuricaemia has been corrected. If an acute attack develops during interval treatment, the treatment should be continued while the acute attack should be treated on its own merit.

Allopurinol is widely used as it is well tolerated. It is not indicated for asymptomatic hyperuricaemia. This drug has a long half-life, so it may be given as once daily dose. If the dose exceeds 300 mg, it should be given in divided doses.

Febuxostat is an alternative of allpurinol and is indicted for chronic hyperuicaemia where urate deposition has already occurred. According to NICE guidance, febuxostat is recommended as an option for management of chronic hyperurcaemia in gout only for patients who are intolerant to allopurinol or for whom allopurinol is contra-indicated.

Sufinpyrazone can be used instead of allopurinol, or in combination with it in cases that are resistant to treatment.

ALLOPURINOL[ED]

Indications: prophylaxis of gout: prophylaxis for uric acid and calcium oxalate renal stones

Cautions: administer prophylactic NSAID (not aspirin or salicylates) or colchicine on initiation of treatment *(see notes above)*; ensure adequate fluid intake (2 litres/day); hepatic and renal impairment. In neoplastic conditions treatment with allopurinol should be started before cytotoxic drugs are given

Contraindications: not a treatment of acute gout; *see notes above*

Side-effects: rashes (if severe- withdraw therapy, if mild - suspend therapy for a time, then reintroduce cautiously but discontinue immediately if rashes recur); fever, lymphadenopathy, arthralgia, eosinophilia; malaise, headache, vertigo, drowsiness; taste disturbance, hypertension, alopecia, hepatotoxicity, peripheral neuropathy

Dose: initially 100 mg daily as a single dose after food, gradually increase at weekly interval according to plasma concentration of uric acid to about 300mg; usual maintenance dose is 200-600 mg daily, divided into doses not more than 300 mg. CHILD (in neoplastic conditions, enzyme disorders) 10-20 mg/kg daily

Proprietary Preparations
Aluric *(Sonear),* Tab. 100 mg, Tk.4.10/Tab.
Alurol *(Incepta),* Tab. 100 mg, Tk.4.00/Tab.
Duric *(Opsonin),* Tab.100 mg, Tk.3.02/Tab.
Esloric *(Square),* Tab. 300 mg, Tk.8.04/Tab.; 100 mg, Tk.4.01/Tab.
Goutex *(Biopharma),* Tab. 100 mg, Tk. 4.02/Tab.
Purinol *(Drug Intl),* Tab. 100 mg, Tk.4.00/Tab.
Purinol *(Unimed),* Tab. 100 mg, Tk.4.00/Tab; Tab. 300 mg, Tk. 12.00/Tab.

FEBUXOSTAT

Indications:chronic hyperuricaemia in gout
Cautions:administer prophylactic NSAID (not aspirin or salicylates) or colchicine on initiation of treatment at least for 6 months after starting treatment with febuxostat *(see notes above)*; monitor liver function before and periodically during treatment; thyroid disorders; ischaemic heart disease; congestive cardiac failure; transplant recipients
Contra-indications:do not start treatment during an acute attack of gout
Side-effects:gastro-intestinal disturbances, oedema, rash, headache; abnormal liver function tests, hyperlipidaemia, cholelithiasis, ECG abnormalities; taste and smell disturbances, flushing, hypertension, chest pain, palpitation, dyspnoea, cough, bronchitis, dizziness, drowsiness, insomnia, paraesthesia, hyposthaesia; apatite and weight changes, diabetes mellitus, increased thyroid stimulating hormone, decreased libido, erectile dysfunction; increased urinary frequency, haematuria, protein-uria, nephrolihtiasis, renal failure; arthralgia, myalgia, muscle weakness, muscle spasm, arthritis, bursitis, dermatitis; rarely- severe hypersen-sitivity reactions including Stevens-Johnson syndrome and acute anaphylaxis
Dose:ADULT over 18 years, 80 mg once daily, if after 4 weeks serum uric acid remains above 6 mg/dl, increase dose to 120 mg once daily

Proprietary Preparations
Barif *(Square),* Tab. , 80 mg, Tk. 22.00/Tab;. 40 mg, Tk. 12.00/Tab.
Eburic *(Beximco),* Tab. , 40 mg , Tk. 12.00/Tab.
Feburen *(Renata),* Tab. , 40 mg, Tk. 12.00/Tab. ; 80 mg, Tk. 22.00/Tab
Febus *(ACI),* Tab. , 80 mg , Tk. 22.00/Tab.; 40 mg , Tk. 12.00/Tab.
Febustat *(Incepta),* Tab. , 40 mg , Tk. 12.00/Tab.; 80 mg, 22.00
Febux *(Aristo),* Tab. , 80 mg, Tk. 22.00/Tab.; 40 mg, Tk. 12.00/Tab.
Feluric*(Healthcare),* Tab., 40 mg, Tk. 12.00/Tab. ; 80 mg, Tk. 22.00/Tab.
Fostat *(Orion),* Tab. , 40 mg, Tk. 10.00/Tab.
Goustat *(Acme),* Tab. , 40 mg, Tk. 12/Tab.
Uristat *(Ibn Sina),* Tab. , 40 mg, Tk. 12.00/Tab.; 80 mg, Tk. 22.00/Tab.
Urostat *(General),* Tab. , 40 mg, Tk. 12.00/Tab.;80 mg, Tk. 22.00/Tab.

SULFINPYRAZONE

Indications: gout prophylaxis, hyperuricaemia
Cautions: ensure adequate fluid intake (about 2-3 litres daily), render urine alkaline if uric acid overload is high; peptic ulceration; cardiac disease (may cause salt and water retension);regular blood count advisable
Contra-indications: history of blood disorder, nephrolithiasis, acute attack of gout
Side-effects: gastro-intestinal disturbances, allergic skin reactions, water and salt retention; rarely blood disorders, acute renal failure, hepatitis
Dose: initially 100-200 mg daily with food (or milk), increasing over 2-3 weeks to 600 mg daily, continue until serum uric acid level returns to normal limits, then reduce to maintenance dose

Generic Preparation
Tablet, 100 mg, 200 mg

9.2 DRUGS USED IN NEUROMUSCULAR DISORDERS

9.2.1 DRUGS WHICH ENHANCE NEUROMUSCULAR TRANSMISSION
9.2.2 MUSCLE RELAXANTS

9.2.1 DRUGS WHICH ENHANCE NEUROMUSCULAR TRANSMISSION

Anticholinesterases are used as first line treatment in myasthenia gravis. Corticosteroids are only given concomitantly if anticholinesterase treatment is failing.

Anticholinesterase drugs enhance neuromuscular transmission in voluntary and involuntary muscles in myasthenia gravis. They prolong the action of acetylcholine by inhibiting the enzyme acetylcholinesterase.

Muscurinic side-effects of anticholinesterases include increased sweating, salivary, and gastric secretion; increased gastrointestinal and uterine motility; bradicardia. Excessive dosage of these drugs may impair neuromuscular transmission and precipitate a 'cholinergic crisis' by causing a depolarising block.

Neostigmine is a useful drug of this group for treating myasthenia gravis. The alternatives, pyridostigmine and distigmine have longer duration of action, therefore have dosage advantage. Diastigmine is not yet available in Bangladesh. **Edrophonium** is a very short acting anticholinesterase useful for diagnosis of myasthenia gravis (yet not available).

Neostigmine produces a therapeutic effect for up to 4 hours. It has pronounced muscarinic action, and needs simultaneous administration of an antimuscarinic drug such as atropine to prevent excessive salivation, colic or diarrhoea. In severe disease Neostigmine can be given every 2 hours. The maximum dose tolerated is 180 mg daily.

Pyridostigmineisslower in action and less potent than neostigmine but has a longer duration of action. It is preferable to neostigmine because of its less frequent dosage and smoother action. It also has less gastro-intestinal side effects but may still require an anti muscarinic drug to counter these side-effects. Daily total dose of pyridostigmine should not exceed 450 mg in order to

prevent acetylcholine receptor down regulation. If pyridostigmine dose exceeds 360 mg per day, then immuno-supressant therapy is usually considered.

NEOSTIGMINE[ED]

Indications: myasthenia gravis; reversal of muscle relaxation action (for nondepolarizing skeletal muscle relaxants) in general anaesthesia *(see also section 8.1.6)*

Cautions: asthma (extreme caution), bradycardia, recent myocardial infection, epilepsy, hypotension, Parkinsonism, vagotonia, peptic ulceration, renal impairment, pregnancy and breast-feeding. Atropine or other antidote to muscarinic effects may be necessary (particularly when neostigmine is given by injection), but it should not be given routinely as it may mask the signs of overdose

Contraindications: intestinal or urinary obstruction

Interactions: *see Appendix- 2*

Side-effects: nausea, vomiting, increased salivation, diarrhoea, and abdominal cramps. Signs of overdose are increased gastrointestinal defect, bronchial secretion, and sweating; involuntary defaecation and micturition; miosis, nystagmus, bradycardia, hypotension; agitation, excessive dreaming, fasciculation and ultimately paralysis

Dose: *by mouth*, neostigmine bromide 15-30 mg at suitable intervals throughout the day, total daily dose 75-300 mg *(see notes above)*, NEONATE 1-5 mg every 4 hours, half an hour before feed; CHILD up to 6 years 7.5 mg initially, 6-12 years initially 15 mg, usual total dose 15-90 mg daily

By subcutaneous or intramuscular injection, neostigmine methylsulphate 1-2.5 mg at suitable intervals throughout day, usual total daily dose 5-20 mg; NEONATE 50-250 micrograms every 4 hours half an hour before feeds; CHILD 200-500 micrograms as required

Proprietary Preparations
see section 8.1.6

PYRIDOSTIGMINE

Indication: myasthania gravis
Cautions: *see* under Neostigmine
Contra-indications: *see* under Neostg-mine
Side-effects: *see* under Neostigmine
Dose: by mouth, 30-120 mg at suitable intervals throughout the day.

Proprietary Preparation
Dostimid *(Unimed),* Tab., 60mg, Tk.22/Tab.

9.2.2. MUSCLE RELAXANTS FOR RELIEF OF CHRONIC MUSCLE SPASM OR SPASTICITY

SKELETAL MUSCLE RELAXANTS
These drugs are useful for relief of acute or chronic skeletal muscle spasm. Diazepam and baclofen act principally on the central nervous system while dantrolene acts on a peripheral site of action. **Tolperisone, eperisone, tizanidine and cyclobenzaprine** are centrally acting skeletal muscle relaxants. The underlying cause of spasticity should be treated concomitantly and any aggravating factor removed.
Baclofen inhibits transmission at spinal level and also depresses the central nervous system. The dose should be increased gradually to avoid sedation and muscular hypotonia.
Dantrolene acts directly on skeletal muscle and produces fewer central adverse effects. The dose should be increased slowly.
Diazepam has a long half-life, so may be given in a convenient once or twice daily dose. Sedation and occasional hypotonia may be a disadvantage.
Tolperisone is an aminoketne derivative with myotonolytic activity. In addition to its skeletal muscle relaxing effects, it has a peripheral vasodilator effect. It has a broad therapeutic spectrum, influencing favourably increased muscle tone, rigidity due to diseases of the extra-

pyramidal system and impaired voluntary movements.
Eperisone is indicated in spasticity.
Tizanidine is an α_2-adrenoceptor agonist indicated for spasticity associated with multiple sclerosis or spinal cord injury.
Cyclobenzaprine is structurally related to trycyclic antidepressants and shares their side-effects. It is useful in painful muscle spasms in nonambulatory patients.

CYCLOBENZAPRINE

Indications: it is used as an adjunct in the symptomatic treatment of painful muscle spasm associated with musculoskeletal conditions in non-ambulatory patients
Cautions: it may cause drowsiness; patients affected should not drive or operate machine
Contraindications: recent myocardial infarction, enlarged prostate, glaucoma, liver disease
Interactions: *see Appendix-2*
Side-effects: sedation, dry mouth, postural hypotension, confusion
Dose: 10-20mg three times daily given by mouth (max. daily dose 60mg.) Note: Treatment more than 3 weeks is not recommended

Proprietary Preparation
Flexor *(Incepta),* Tab. 10 mg, Tk. 3.00/Tab.; 5mg, Tk. 2.00/Tab

DIAZEPAM[ED][CD]

(see also section 7.1, 7.2 & 7.6.2)

Indications: muscle spasm of varied aetiology, including tetanus; other indications

Cautions, Contraindications and Side-effects: *see notes above*

Interactions: *see Appendix-2*

Dose: *by mouth,* 5-15 mg in single or twice daily doses initially, increased to 60 mg daily in divided doses if necessary. Cerebral spasticity, in selected cases, 2-40 mg daily in divided doses

By intramuscular or intravenous injection (into a large vein at a rate not more than 5 mg/minute), in acute muscle spasm, 10 mg repeated if necessary after 4 hours
tetanus, ADULT and CHILD, by intravenous injection, 100-300 microgram/kg repeated every 1-4 hours

Proprietary Preparations
see section 7.1

EPERISONE

Indications: spasticity and rigidity of skeletal muscles due to lesions of the pyramidal tract, multiple sclerosis, encephalomyelitis; cerebral palsy; muscle spasm due to back or neck pain

Cautions and Side-effects: muscular weakness

Dose: 50-150 mg 3 times daily

Proprietary Preparations
Myonil *(Square),* Tab., 50 mg, Tk. 3.01/Tab.
Eprel *(Orion),* Tab., 50 mg, Tk. 3.01/Tab.

TIZANIDINE

Indications: painful muscle spasm associated with functional disorders of the spine and spasticity due to multiple sclerosis, spinal cord injury, cerebrovascular accident

Cautions: impaired renal and liver function; in pregnancy and breast-feeding. Monitor liver functions monthly for 4 months and then in those who develop unexplained nausea, anorexia or fatigue

Contraindications: known hypersensitivity to tizanidine, severe hepatic impairment

Interactions: *see Appendix-2*

Side-effects: fatigue, dizziness, dry mouth, gastrointestinal disturbances slight decrease in blood pressure; also reported; insomnia, transient increase in serum transaminases, bradycardia

Dose: in painful muscle spasm, 2 mg 3 times daily; spasticity due to neuromuscular disorders, 6 mg/day in 3

divided doses, then increase stepwise 12 to max. 36 mg daily CHILD not recommended

Proprietary Preparations
Tizadin *(ACI),* Tab., 2 mg, Tk. 5.02/Tab.
Relentus *(Beximco),* Tab., 2 mg, Tk. 5/Tab.
Sirdalud *(Novartis),* Tab., 2 mg, Tk. 10/Tab.
Tizalud *(Opsonin),* Tab., 2 mg, Tk. 3.77/Tab.

TOLPERISONE

Indications: spasticity and rigidity of skeletal muscles due to lesions of the pyramidal tract, multiple sclerosis, encephalomyelitis; cerebral palsy; muscle spasm due to back or neck pain

Cautions and Side-effects: muscular weak-ness, somnolence (rarely in children)

Dose: *oral,* 150-450 mg 3 times daily. CHILD 3 months to 6 years, 5-10 mg/kg daily in divided doses, 6-12 years, 1-2 mg/kg daily in divided doses
Injections, for adults, 100-200 mg slowly intravenously or intramuscularly

Proprietary Preparations
A-Calm *(Acme),* Tab., 50 mg, Tk. 4.00/Tab.
Lexaton *(Drug Int.),* Tab., 50 mg, Tk. 3/Tab.
Musclex *(Aristo),* Tab., 50 mg, Tk. 5/Tab.
Myolax *(Incepta),* Tab., 50 mg, Tk. 5/Tab; Tab., 100 mg, Tk. 8/Tab.
Myoson *(Ibn Sina),* Tab., 100 mg,Tk. 5/Tab.; 50 mg, Tk. 3/Tab.
Myoxan *(Globe),* Tab. 50 mg, Tk. 4/Tab.
Myoxant *(Unimed),* Tab., 50 mg, Tk. 5/Tab.
Rison *(Kemiko),* Tab., 50 mg, Tk. 4/Tab.
Tolcalm *(General),* Tab., 50 mg, Tk. 4/Tab.
Tolmus *(Beximco),* Tab., 50 mg, Tk. 3/Tab.
Tolpa *(Biopharma),* Tab., 50 mg, Tk. 4/Tab.
Tolson *(Opsonin),* Tab., 100 mg, Tk. 3.77/Tab.; Tab., 50 mg, Tk. 3.01/Tab.
Toperin *(Eskayef),* Tab., 50 mg, Tk. 3/Tab.

9.3 DRUGS USED IN TREATING INFECTIONS OF BONES, JOINTS AND TENDON SHEATHS

Infections of bones and joints require urgent and energetic treatment to avoid chronic disabling complications or permanent damage to the skeletal system. Infections of tendon sheaths also require energetic early treatment to avoid permanent deformity and loss of function. Ideally culture and sensitivity testing should guide all antibiotic treatment. However, acute infections of bones, joints and tendon sheaths require immediate commencement of antibiotic therapy depending on probable microbial agent, to be guided and modified, whenever possible, by antibiogram. Acute osteomyelitis requires at least 6 weeks of antibiotic therapy, while chronic osteomyelitis requires at least 12 weeks regimen.
Infections of bones, joints and tendon sheaths frequently require surgical intervention. To relieve pain non-steroidal anti-inflammatory drugs (NSAIDs) with strong analgesic and anti-inflammatory effects are indicated *(see section in 9.1.1 on NSAIDs)*. Supportive treatment such as splintage is also important during treatment.

9.3.1 ANTI INFECTIVE AGENTS

Acute osteomyelitis and septic arthritis: The causal organism is usually *Staphylococcus aureus*, less commonly one of the other Gram-positive cocci, such as *Streptococcus pyogenes* or *S. pneumoniae*. The Gram-negative *Haemophilus influenzae* is a common pathogen in the under 4 year age group. Occasionally these osteoarticular infections are caused by other Gram-negative organisms like *Escherichia coli, Pseudomonas aeruginosa, Proteus mirabilis* and the anaerobic *Bacteroides fragilis*.

For ADULTS and CHILDREN of age of 5 years and above: Flucloxacillin and Benzyl-penicillin/Fusidic Acid (all drugs initially should be administered I/V till patient's condition begins to improve-usually 3 to 4 days). Amoxycillin may be used in place of Benzylpenicillin. Below 5 years (and whenever the agent is *H. influenzae*), start with Amoxycillin/ Cefuroxime and Flucloxacillin. *(See chapter on infections)*.Chronic osteomyelitis:Usually there is a mixed infection. The usual causative pathogens are *Staphylococcus aureus, Streptococcus pyogenes, Proteus* and

Pseudomonas. In chronic infections in the presence of implants, *Staphylococcus* epidermidis is the commonest organism. To control flares use Flucloxacillin, Ciprofloxacin, Erythromycin, Cephradine, Cefuroxime, Gentamicin or Cephtriaxone according to antibiogram. Surgical procedures are commonly required. *(See section in 1.1 on anti-infectives).*

Suppurative tenosinovitis: The causative organism is usually *Staphylococcus aureus*. Treat with parenteral Benzylpenicillin and Flucloxacillin. In presence of purulent collection within the tendon sheath surgical irrigation with normal saline with Benzylpenicillin is required in addition. *(see section in 1.1 on anti-infectives).*

Osteoarticular tuberculosis: All efforts must be made to establish a confirmatory diagnosis. A 12-month course of Rifampicin, INH and Pyrazinamide should be instituted. Ethambutol may be added for the initial 2 to 4 months in adults. Streptomycin should be used in resistant strains. *(See section in 1.1.9 on antituberculous drugs)*.

9.4 SUPPLEMENTARY DRUGS USED IN JOINT DISEASES

Different biologic agents and nutrition supplements have been used to treat degenerative or inflammatory joint diseases. Glucosamine hydrochloride is approved in Bangladesh for therapeutic use in osteoarthritisfor its chondroprotective properties.The mechanism of action is not understood and there is limited evidence to show it is effective.Combination product of glucosamine sulphate and chondroitin sulphate, is also useful in chronic management of degenerative arthritis as they provide a synergistic chondroprotective effect.Combination of glucosamine sulphate and diacerein with similar synergistic chondro-protective effects with added benefit of analgesic effects has been licensed. Diacerein works by inhibiting interleukin-1 beta.

GLUCOSAMINE

Indications: mild to moderate osteoarthritis of knee and hip

Cautions: diabetic patients are advised to monitor blood glucose level. Pregnancy and lactation (enough studies have not been carried out)

Contraindications: known hypersensitivity to glucosamine sulphate

Side-effects: Gastro-intestinal upsets (uncommon)

Dose: *by mouth*, 1.5g daily in single or divided doses

Proprietary Preparations

Glustin *(General),* Tab., 500 mg, Tk. 3.51/Tab.
Joinix *(Incepta),* Tab., 500 mg, Tk. 3.00/Tab

GLUCOSAMINE + CHONDROITIN

Indication: mild to moderate osteoarthritis of knee, hip, spine and other locations
Caution: *see notes above*
Contraindications: known hypersensitivity to glucosamine sulphate or chondritin sulphate
Side-effects: gastro-intestinal upset
Dose: *by mouth,* glucosamine sulphate 750-1500mg + Chondroitin sulphate 600-1200mg daily in divided doses with meals

Proprietary preparations

Glucosamine 250mg + Chondroitin 200mg,
Arth-A *(Acme),* Tab., Tk. 8.04/Tab.
Arthrosin *(Unimed),* Tab. , Tk. 8.00/Tab.
Articulex *(Ibn Sina),* Tab. , Tk. 8.25/Tab.
Artiflex *(Rangs),* Tab., 250 mg+200 mg, Tk. 8.00/Tab.
Bencart *(Benham),* Tab. , , Tk. 8.00/Tab.
Bonflex *(Eskayef),* Tab, Tk. 8.00/Tab.
Carticare *(Radiant),* Tab. , Tk. 19.00/Tab.
Carticel Plus *(Opsonin),* Tab., Tk. 3.77/Tab.
Cartifit *(Globe),* Tab., 250 mg+200 mg, Tk. 7.00/Tab.
Cartigen *(Somatec),* Tab. , Tk. 8.03/Tab.
Cartilage Plus *(Renata),* Tab. , Tk. 8.03/Tab.
Cartilex *(ACI),* Tab. , , Tk. 8.03/Tab.
Contilex *(Square),* Tab. , Tk. 8.50/Tab.
Glucotin Plus *(Drug Int.,),* Tab. , Tk. 8.00/Tab.
Glustin Plus *(General),* Cream, 2% + 3%, Tk. 100.00/15 gm; Tk. 180.00/30 gm

Glustin Plus *(General),* Tab. , Tk. 8.03/Tab.
Joinix Plus *(Incepta),* Tab. , Tk. 8.00/Tab.
Jointin *(Globex),* Tab. , 250 mg/ 200 mg, Tk. 8.00/Tab.
Nostis *(Ambee) ,* Tab., 250 mg+200 mg , Tk. 8.03/Tab
Rejoin *(Aristo),* Tab. , Tk. 8.00/Tab.
Synflex *(Healthcare),* Tab., Tk. 8.50/Tab.

GLUCOSAMINE + DIACEREIN

Indications: osteo-arthritis of knee, hip and other joints
Cautions: liver disease
Contra-indications: hypersensitivity to glucosamine or diacerein
Side-effects: gastro-enteritis (dirrhoea), yellow or pink discolouration of urine
Dose: ADULTS, orally start with (Glucos-amine 750 mg +Diacerein 50 mg) daily for first 2 weeks, then increase to Glucosamine 1500 mg + Diacerein 100 mg daily; continue up to 3 years

Proprietary Preparations
Diacerein 50mg +Glucosamine 750 mg
Cosarin *(Opsonin),* Tab., Tk. 9.02/Tab.
Jointec Max *(Beximco),* Tab. , Tk. 12.00/Tab.
Glustin Max *(General),* Tab. , Tk. 12.00/Tab.

9.5 DRUGS USED IN OSTEOPOROSIS

see section 5.6