

## Chapter 7

# CENTRAL NERVOUS SYSTEM

- 7.1 Hypnotics and anxiolytics *p.294*
- 7.2 Drugs used in psychosis and related disorders *p. 300*
- 7.3 Antidepressant drugs *p. 306*
- 7.4 Drugs used in substance dependence *p.312*
- 7.5 Analgesics *p. 313*
  - 7.5.1 Opioids *p. 313*
  - 7.5.2 Non-opioids *p.315*
    - 7.5.2.1 Paracetamol *p. 316*
    - 7.5.2.2 Aspirin (Acetylsalicylic acid) *p.318*
    - 7.5.2.3 Other non-steroidal anti-inflammatory drugs (NSAIDs) *p.318*
  - 7.5.3 Drugs used in neuralgic/neuropathogenic pain *p. 319*
  - 7.5.4 Drugs used in migraine *p. 319*
    - 7.5.4.1 Acute migraine attack *p.319*
    - 7.5.4.2 Prophylaxis of migraine *p.322*
- 7.6 Antiepileptic drugs *p. 323*
  - 7.6.1 Control of epilepsy *p. 323*
  - 7.6.2 Status epilepticus *p. 329*
- 7.7 Drugs used in parkinsonism *p.330*
  - 7.7.1 Dopaminergic drugs *p. 330*
  - 7.7.2 Antimuscarinic drugs *p. 333*
  - 7.7.3 Drugs used in essential tremor, chorea, tics and related disorders *p.334*
- 7.8 Drugs used in nausea, vomiting and vertigo *p. 334*
- 7.9 Drugs used in the treatment of obesity *p. 339*
- 7.10 Drugs used for dementia *p. 340*

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### 7.1 HYPNOTICS & ANXIOLYTICS

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Hypnotics are used to treat sleep disturbances (insomnia) and anxiolytics are used to treat the symptoms of anxiety. Drugs that relieve anxiety generally cause a degree of sedation and drowsiness which is often a drawback in the clinical use of anxiolytic drugs. Hypnotics and anxiolytics should be reserved for short-time use because these drugs can cause dependence and tolerance.

Hypnotics are to be prescribed with caution. A hypnotic can be useful for short-term insomnia, but should not be given for more than 3 weeks. Routine prescribing of hypnotic is not encouraged; these should not be prescribed randomly. They should be reserved for

short term use in acutely distressed patients.

CHILD: The prescribing of hypnotics to children is not rational except for night terror and sleep-walking.

ELDERLY: It is better to avoid hypnotics for the elderly who are prone to develop confusion and are at risk of becoming ataxic.

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### BENZODIAZEPINES

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Benzodiazepines have hypnotic, sedative, anxiolytic, anticonvulsant and muscle relaxant actions. They bind to specific receptors in the central nervous system, which are associated with GABA (gamma-aminobutyric acid).

Benzodiazepines used as hypnotics include **Diazepam**, **nitrazepam**, **flunitrazepam** and **flurazepam**, all of

## 7. CENTRAL NERVOUS SYSTEM

which are long-acting and may cause hangover on the following day; **loprazolam**, **lormetazolam** and **temazepam** being short-acting have no hangover effect. However, withdrawal effects are more common with short-acting benzodiazepines.

**Diazepam**, a long acting benzodiazepine can be prescribed as a single dose at bed time to patients suffering from insomnia associated with day time anxiety. It is recommended that the need for continuing benzodiazepines be reassessed frequently.

Benzodiazepines also have effect on the function of other neurohormones (catecholamines, serotonin, etc.) that may have relevance to their use in mental disorders. If a benzodiazepine is used as a hypnotic, consideration of its half-life of activity is important. For example, both **flurazepam** and **triazolam** are used for treating sleep disorders. Flurazepam is long acting with a half-life of 47 to 100 hours. This pharmacokinetic profile may explain the observation that flurazepam is increasingly effective on the second or third night after use and, similarly that after discontinuing the drug, sleep, latency and total wake time may be decreased. Hence flurazepam appears to be most useful in person with both significant daytime anxiety and insomnia. In contrast triazolam, also an effective hypnotic is a short acting benzodiazepine with a relatively rapid onset of action and a half-life of 1.5 to 5.5 hours. This would suggest that triazolam is the drug of choice for sleep onset in insomnia, and is preferable in terms of less risk and unwanted day time sedation.

In general psychiatry, benzodiazepines are indicated in the management of anxiety disorders or for the short time relief of the symptoms of anxiety and the short-term relief of some sleep disorders. They are also used to treat acute symptom of alcohol withdrawal.

**Lorazepam**, **temazepam** and **oxazepam** are preferred in patients with

hepatic impairment but they carry a greater risk of withdrawal symptoms.

Sleep disturbance is very common in depressive illness. In such cases an antidepressant such as amitriptyline

(see section 7.3) is the drug of choice instead of benzodiazepines.

Anxiolytic treatment with benzodiazepines should be with the minimum possible dose for the shortest possible time. **Diazepam**, **alprazolam**, **bromazepam**, **chlordiazepoxide**, **chlorazepate**, **clobazam**, **oxazepam**, **lorazepam** **temazepam** are indicated for the short-term relief of anxiety. In children, anxiolytic treatment should be used only to relieve acute anxiety caused by fear.

Contraindications. Known hypersensitivity to **benzodiazepines** and acute narrow angle glaucoma are usually considered as absolute contraindications. Persons predisposed to substance abuse or alcoholism should be given benzodiazepines with caution because these may cause physical and psychological dependence and also interact additively with other sedative or hypnotic drugs. Pregnant women should be prescribed benzodiazepines with caution as there are increasing numbers of reports of congenital malformations.

Interactions. Clinically the most important interaction of benzodiazepines are their additive effects when combined with other sedative or hypnotic drugs including alcohol (ethanol), phenothiazines, narcotics, barbiturates, MAOIs, tricyclic anti-depressants (see also *Appendix-2*).

Benzodiazepines being central nervous system depressants have the common effects of sedation, fatigue, drowsiness, ataxia and confusion, progressing to coma which may occur at high doses.

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### ALPRAZOLAM [CD]

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**Indications:** agoraphobia with frequent panic attack, panic disorder, anxiety, depressive syndrome where anxieties are the predominant cause, generalized anxiety disorder, situational anxiety

## 7. CENTRAL NERVOUS SYSTEM

**Cautions:** driving and operating machinery, children dependence; 10 times more potent than diazepam

**Contraindications:** pregnancy and lactation

**Interactions:** see Appendix-2

**Side-effects:** drowsiness, light headedness, dry mouth, nausea, vomiting, allergy, rebound anxiety

**Dose:** usual range of dose is 2 to 6mg daily. For anxiety, 0.25-0.5 mg three times daily

Panic disorder with agoraphobia needs higher doses such as 0.5 mg 3 times daily. Dose depends upon the individual and severity of condition

### Proprietary Preparations

**Actrim (Globe)**, Tab. 500 microgram, Tk. 1.75/Tab.

**Alpam (Asiatic)**, Tab. 250 microgram, Tk. 1.00; 500 microgram, Tk. 2.00/Tab.

**Alprax (Opsonin)**, Tab. 250 microgram, Tk. 0.75/Tab.; 500 microgram, Tk. 1.51/Tab. XR Tab. 1 mg, Tk. 3.02/Tab.; 2 mg, Tk. 6.04/Tab.

**Alprazol (Albion)**, Tab. 250 microgram, Tk. 1.00/Tab.; 500 microgram, Tk. 2.00/Tab.

**Alzolam (Sun)**, Tab. 250 microgram, Tk. 1.12/Tab.; 500 microgram, Tk. 2.03/Tab.; SRTab. 1 mg, Tk. 4.00/Tab.

**Nixalo (Square)**, Tab. 500 microgram, Tk. 2.00/Tab.

**Serelam (General)**, Tab. 250 microgram, Tk. 1.00/Tab.; 500 microgram Tk. 2.01/Tab.

**Xanax (Navana)**, Tab. 500 microgram, Tk. 2.50/Tab.; 250 microgram, Tk. 1.00/Tab.

**Xiotic (Globe)**, Tab., 0.5 mg, Tk. 1.75/Tab.

**Xolam XR (Aristo)**, Tab. 500 microgram, Tk. 2.50/Tab.; 1 mg, Tk. 4.00/Tab.

**Zolax (Beximco)**, Tab. 250 microgram, Tk. 1.00/Tab.; 500 microgram, Tk. 2.00/Tab.

**Zolium (Incepta)**, Tab. 250 microgram, Tk. 1.50/Tab.; 500 microgram, Tk. 3.00/Tab.

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### BROMAZEPAM [CD]

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**Indications:** anxiety, agitation, insomnia, muscle spasm and alcohol withdrawal syndrome

**Interactions:** see Appendix-2

**Side-effects:** dependence, sedation, mental confusion

**Dose:** 3-18 mg daily in divided doses  
CHILD not recommended

### Proprietary Preparations

**Ancotil (Rangs)**, Tab., 3 mg, Tk. 4.00/Tab.

**Anxio (Unimed)**, Tab. 3 mg, Tk. 4.50/Tab.

**Anxionil (Nipro JMI)**, Tab. 3 mg, Tk. 5.00/Tab.

**Anxopam (Popular)**, Tab. 3 mg, Tk. 4.00/Tab.

**Bomaxen (Sonear)**, Tab. 3 mg, Tk. 5.00/Tab.

**Bomaz (Sharif)**, Tab. 3 mg, Tk. 4.00/Tab.

**Bopam (Opsonin)**, Tab. 3 mg, Tk. 3.40/Tab.

**Brolon (Albion)**, Tab. 3 mg, Tk. 3.00/Tab.

**Bromazep (Orion)**, Tab. 3 mg, Tk. 4.00/Tab.

**Broze (Biopharma)**, Tab. 3 mg, Tk. 5.00/Tab.

**Brozep (Alco)**, Tab. 3 mg, Tk. 4.00/Tab.

**Carbocal-D (Globe)**, Tab. 3 mg, Tk. 4.50/Tab.

**Freten (Delta)**, Tab. 3 mg, Tk. 2.00/Tab.

**Kpam (Kemiko)**, Tab. 3 mg, Tk. 4.00/Tab.

**Laten (Supreme)**, Tab. 3 mg Tk. 5.00/Tab.

**Laxonil (Rephco)**, Tab. 3 mg, Tk. 3.00/Tab.

**Laxyl (Square)**, Tab. 3 mg, Tk. 5.00/Tab.

**Lexnil (Asiatic)**, Tab. 3 mg, Tk. 4.00/Tab.

**Lexopil (Healthcare)**, Tab. 3 mg, Tk. 5.00/Tab.

**Lexotaniil (Radiant)**, Tab. 3 mg, Tk. 7.00/Tab.

**Nightus (Beximco)**, Tab. 3 mg, Tk. 3.00/Tab.

**Norry (Renata)**, Tab. 3 mg, Tk. 5.00/Tab.

**Notens (Aristo)**, Tab. 3 mg, Tk. 5.00/Tab.

**Relaxium (Amico)**, Tab. 3 mg, Tk. 4.00/Tab.

**Rem (Ambee)**, Tab., 3 mg, Tk. 3.00/Tab

**Restol (Eskayef)**, Tab. 3 mg, Tk. 5.00/Tab.

**Siesta (Incepta)**, Tab. 3 mg, Tk. 4.00/Tab.

**Tenapam (General)**, Tab. 3 mg, Tk. 5.00/Tab.

**Tenil (Acme)**, Tab. 3 mg, Tk. 5.00/Tab.

**Tensfree (Globe)**, Tab., 3 mg, Tk. 4.50/Tab.

**Tynaxie (Navana)**, Tab. 3 mg, Tk. 5.00/Tab.

**Xionil (Novartis)**, Tab. 3 mg, Tk. 5.00/Tab.

**Zepam (ACI)**, Tab. 3 mg, Tk. 5.00/Tab.

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### CLOBAZAM

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**Indications:** generalized anxiety disorder, stress, agitation, aggression, psychosomatic disorders, sleep disturbances associated with anxieties, an adjunctive therapy in epilepsy

**Cautions, Contraindications:** see diazepam

**Interactions:** see also Appendix-2

It potentiates the effects of alcohol and of drugs (such as analgesics, hypnotics, neuroleptics) that depress the central nervous system). Respiratory depression if used in combination treatment with clozapine.

**Side-effects:** ataxia, drowsiness (especially in the elderly), disorientation, dizziness and occasionally confusion. It can develop dependence on higher doses used for long duration. Muscle weakness, and sedation may also occur.

## 7. CENTRAL NERVOUS SYSTEM

**Dose:** anxiety, 20-30mg daily in divided dose or as a single dose at bed time, increased in severe anxiety (in hospital patient) to a max. of 60mg daily in divided dose; ELDERLY: (or debilitated) 10-20 mg daily. Epilepsy, 20-30mg daily; max. 60mg daily; CHILD: over 3 years, not more than half adult dose

### Proprietary Preparations

**Alsium** (*Albion*), Tab., 10 mg, Tk. 1.00/Tab.  
**Calm** (*Biopharma*), Tab., 10 mg, Tk. 2.76/Tab.  
**Clob** (*Opsonin*), Tab., 10 mg, Tk. 2.08/Tab.  
**Clobam** (*Square*), Tab., 10 mg, Tk. 4.00/Tab.  
**Clobid** (*Medimet*), Tab., 10mg, Tk.3.00/Tab.  
**Cosium** (*Acme*), Tab., 10 mg, Tk. 3.51/Tab.  
**Frisium** (*Sanofi*), Tab., 10 mg, Tk. 5.00/Tab.  
**Genac** (*Globe*), Tab., 10 mg, Tk. 2.55/Tab.  
**Keolax** (*Beximco*), Tab., 10 mg, Tk. 2.77/Tab.  
**Nebium** (*Globe*), Tab., 10 mg, Tk. 2.55/Tab.  
**Tensnil** (*Alco*), Tab., 10 mg, Tk. 4.00/Tab.  
**Tranquil** (*Ibn Sina*), Tab., 10 mg, Tk. 4/Tab.  
**Venium** (*Hudson*), Tab., 10mg, Tk.2.70/Tab.

### DIAZEPAM<sup>[ED]</sup> [CD]

**Indications:** insomnia, generalized anxiety disorder, phobic disorder, panic disorder, status epilepticus, catatonia, muscle spasm, alcohol withdrawal syndrome

**Cautions:** pregnancy, lactating mothers, respiratory diseases, muscle weakness (special care in myasthenia gravis), history of alcohol or drug abuse elderly

**Contraindications:** hypersensitivity, drug dependence

**Interactions:** see Appendix-2

**Side-effects:** dependence, sedation, confusion, headache, decrease of libido

**Dose:** 15 - 60 mg/day. Reduce dose in the ELDERLY.

### Proprietary Preparations

**Azepam** (*Acme*), Tab., 5 mg, Tk. 0.69/Tab.  
**Diazem** (*Albion*), Tab., 5 mg, Tk. 0.69/Tab.  
**Diazemet** (*Medimet*), Tab., 5 mg, Tk. 0.50/Tab.  
**Diazepam** (*Popular*), Tab., 5 mg, Tk. 0.68/Tab.  
**D-Pam** (*General*), Tab., 5 mg, Tk. 0.68/Tab.  
**Easium** (*Opsonin*), Supp., 10 mg, Tk. 2.26/Supp.; Inj., 10 mg/2 ml, Tk. 2.77/Amp.; Tab., 5 mg, Tk. 0.52/Tab.  
**Evalin** (*Aristo*), Tab., 5mg, Tk. 0.68/Tab.

**G-Diazepam** (*Gonoshasthaya*), Inj., 10 mg/2ml, Tk. 3.69/Amp.; Tab., 5 mg, Tk. 0.30/Tab.  
**Relaxen** (*Sonear*), Tab., 5 mg, Tk. 0.68/Tab.  
**Sedapan** (*Amico*), Tab., 5 mg, Tk. 0.21/Tab.  
**Sedatab** (*Supreme*), Tab., 5mg, Tk. 0.68/Tab.  
**Sedil** (*Square*), Inj., 10 mg/2 ml, Tk. 3.05/Tab.; Tab., 5 mg, Tk. 0.69/Tab.  
**Seduxen** (*Ambee*), Inj., 10 mg/2ml, Tk.3.6/2ml Amp; Tab., 5 mg, Tk. 0.23/Tab

### FLURAZEPAM<sup>[CD]</sup>

**Indications:** mainly used as hypnotic in insomnia and generalized anxiety disorders

**Caution:** pregnancy and lactating mother; see under *Diazepam*

**Contraindications:** respiratory depression, drug dependence

**Interactions:** see Appendix-2

**Side-effects:** dependence, sedation, confusion, headache

**Dose:** 15–60 mg/day

### Proprietary Preparations

**Aluctin** (*Ambee*), Cap., 30 mg, Tk. 6.00/Cap.  
**Flurazepam** (*Albion*), Cap., 15 mg, Tk. 3.51/Cap.; 30 mg, Tk. 6.00/Cap.  
**Slipam** (*General*), Cap., 15 mg, Tk. 4.50/Cap.; 30 mg, Tk. 8.00/Cap.

### LORAZEPAM<sup>[CD]</sup>

**Indications:** anxiety disorders, short-term management of insomnia, as an anticonvulsant in the management of status epilepticus. It is also used for its sedative and amnesic properties in premedication; also in antiemetic regimens for the control of nausea and vomiting associated with cancer chemotherapy.

**Cautions, Contraindications, Side-effects :** see *diazepam*

**Interactions:** see Appendix-2

**Dose:** anxiety disorders, *by mouth*, 1-6 mg 2/3 times daily; in insomnia associated with anxiety, a single dose of 1-2 mg at bedtime. In the management of status epilepticus, 4 mg may be given as a single intravascular dose  
CHILD not recommended

## 7. CENTRAL NERVOUS SYSTEM

### **Proprietary Preparations**

**Lorapam** (*Popular*), Inj., 4 mg/ml, Tk.75.28/Amp

**Lorazem** (*Albion*), Tab., 1 mg Tk. 2/Tab.

**Lozicum** (*Incepta*), Tab., 1 mg, Tk. 2/Tab.

**Trapex** (*Sun*), Tab., 1 mg, Tk. 2/Tab.

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### **NITRAZEPAM**<sup>[CD]</sup>

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**Indications:** insomnia, myoclonic seizure

**Caution:** pregnancy and lactating mother (see also *Diazepam* above)

**Contraindications:** respiratory depression, drug dependence

**Interactions:** see *Appendix-2*

**Side-effects:** dependence, sedation, confusion, headache

**Dose:** 5–20 mg/day

### **Proprietary Preparations**

**Epam** (*Opsonin*), Tab., 5 mg, Tk. 0.57/Tab.

**Nectum** (*Albion*), Tab., 5 mg, Tk. 0.69/Tab.

**Noctin** (*Ambee*), Tab. 5 mg, Tk. 0.69/Tab.

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### **TEMAZEPAM** <sup>[CD]</sup>

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**Indications:** insomnia (short-term use) for peri-operative use; see also *section 7.1*

**Cautions** see under *Nitrazepam & notes above*

**Contra-indications:** see under *Nitrazepam & notes above*

**Interactions:** see *Appendix-2*

**Side-effects** see under *Nitrazepam*.

**Dose:** ADULT 10–20 mg at bedtime, exceptional circumstances 30–40 mg; ELDERLY (or debilitated) 10mg at bedtime, exceptional circumstances 20 mg; CHILD not recommended

### **Generic Preparation**

Tablet, 10 mg

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### **OTHER HYPNOTICS/ANXIOLYTICS**

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**Zopiclone**, **zolpidem** and **zaleplon** are non benzodiazepine hypnotics; but they act at the benzodiazepine receptors and rapidly initiates sleep, without reduction of total REM sleep. Zopiclone and zolpidem have short elimination half-life, with no significant accumulation of

drug substance on repeated doses. A course of treatment of these drugs should be no longer recommended for more than 4 weeks of duration.

**Beta-blockers** (beta-adrenoceptor blocking agents) such as **propranolol** and **oxprenolol** (see *section 3.1*) do not affect psychological symptoms (such as worry, anxiety, tension, fear, etc.), but they reduce autonomic symptoms such as palpitation and tremor. Beta-blockers are used mainly to reduce psychosomatic symptoms (e.g. tremor, palpitations, sweating etc.) which in turn may prevent the onset of worries, anxieties and fear.

**Antihistamines** with sedative action, such as **diphenhydramine** and **promethazine hydrochloride** (for details see *section 4.7.1*) are sometimes used for induction of sleep, particularly for wakeful children but the random use of these drugs in children is not clinically justified.

In recent times, **bupirone** which acts specifically on the 5HT (5-Hydroxytryptamine) receptors has been used as an anxiolytic; it does not have any appreciable sedative action.

**Barbiturates** are now practically obsolete as sedative and anxiolytic agents, though some intermediate-acting barbiturates (e.g. amobarbitone, butobarbitone, secobarbital, etc.) are still occasionally prescribed in the treatment of severe intractable insomnia. Barbiturates should be avoided in the elderly.

**Chloral Hydrate** and **paraldehyde** are no longer recommended as sedatives. **Meprobamate** is less effective than benzodiazepines, more hazardous in over-dosage, and more likely to induce dependence; it is not recommended for use.

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### **BUSPIRONE HYDROCHLORIDE**

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**Indications:** in anxiety states (short-term use)

**Cautions:** history of hepatic or renal impairment; does not alleviate benzodiazepine withdrawal

## 7. CENTRAL NERVOUS SYSTEM

**Contraindications:** epilepsy; severe hepatic or renal impairment; children, pregnancy and lactating women

**Interactions:** see *Appendix-2*

**Side-effects:** nausea, dizziness, headache, nervousness, rarely tachycardia, palpitation and chest pain

**Dose:** by mouth, initially 5 mg 2-3 times daily, increased as necessary every 2-3 days; usual range 15-30 mg in divided doses; max. 45mg daily. CHILD: not recommended

### **Generic Preparations**

Tablets, 5mg; 10 mg

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### **ESZOPICLONE**

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#### **Indications, Cautions,**

**Contraindications, Side-effects:** see under *Zopiclone*

**Dose:** Initial dose: 1 mg orally immediately before bedtime

#### **Proprietary Preparations**

**Sleepwell** (*Popular*), Tab., 1 mg, Tk. 2.01/Tab.; 2 mg, Tk. 3.01/Tab.

**Sono** (*Acme*), Tab., 1 mg, Tk. 2.01/Tab; 2 mg, Tk. 3.00/Tab.

**Zopilone** (*Incepta*), Tab., 2 mg, Tk. 3.00/Tab.

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### **PROPRANOLOL** <sup>[ED]</sup>

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**Indications:** treatment of somatic manifestations of generalized anxiety disorder, anticipatory and situational anxiety, treatment of drug induced tremor, anaesthesia, migraine, alcohol withdrawal syndrome

**Side-effects & Contraindications:** see section 3.1

**Interactions:** see *Appendix-2*

**Dose:** 20–240 mg/day

#### **Proprietary Preparation**

see section 3.1

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### **ZALEPLON**

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**Indication:** short term treatment of insomnia

**Contraindications:** sleep apnoea syndrome; myasthenia gravis; not to be used individually to treat psychosis and lactating mothers

**Cautions:** respiratory insufficiency, hepatic impairment (*Appendix-3*), history of drug or alcohol abuse, avoid prolonged use (and abrupt withdrawal thereafter), pregnancy (*Appendix-5*), not to be used individually to treat depression

**Interactions:** see *Appendix-2*

**Side effects:** headache, asthenia, drowsiness, dependence, dizziness, amnesia, paradoxical effects

**Dose:** 10mg at bedtime or after going to bed if difficulty in falling asleep; CHILD: Under 18 years not recommended.

#### **Proprietary Preparations**

**Eplon** (*Beximco*), Cap. 10mg Tk. 10/Cap;

**Somna** (*Square*), Cap. 10mg, Tk. 7/Cap.;

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### **ZOLPIDEM TARTRATE**

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**Indications** insomnia (short-term use—up to 4 weeks)

**Cautions** depression, muscle weakness and myasthenia gravis, history of drug or alcohol abuse; elderly; avoid prolonged use (and abrupt withdrawal thereafter); Driving Drowsiness may persist the next day and affect performance of skilled tasks; effects of alcohol enhanced

**Contra-indications** obstructive sleep apnoea, acute or severe respiratory depression, marked neuromuscular respiratory weakness including unstable myasthenia gravis, psychotic illness, hepatic impairment; renal impairment, pregnancy and breast-feeding

**Interactions:** see *Appendix-2* (anxiolytics and hypnotics)

**Side-effects:** diarrhoea, nausea, vomiting, dizziness, headache, drowsiness, hallucination, agitation, asthenia, amnesia; dependence, memory disturbances, nightmares, depression, confusion, perceptual disturbances or diplopia, tremor, ataxia, falls, skin reactions, changes in libido; paradoxical effects, muscular weakness, and sleep-walking also reported

**Dose:** ADULT: over 18 years, 10mg at bedtime; ELDERLY: (or debilitated) 5mg

#### **Proprietary Preparations**

**Nitrest** (*Sun*), Tab., 10 mg, Tk. 3.16/Tab.

## 7. CENTRAL NERVOUS SYSTEM

**Zolexin** (*Opsonin*), Tab., 10 mg, Tk. 3.71/Tab.

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### ZOPICLONE

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**Indications:** short-term treatment of insomnia, including difficulties in falling asleep, and early awakening, transient insomnia, insomnia secondary to psychiatric illness and insomnia due to severe distress

**Cautions:** dose should be half in liver diseases

**Contraindications:** children, pregnancy and lactating mothers

**Interactions:** see *Appendix-2*

**Side-effects:** bitter taste following ingestion, behavioral disturbances including confusion, depressed mood, irritability and amnesia have been reported. With accidental overdoses, drowsiness, lethargy and ataxia have been reported without any other serious effects

**Dose:** by mouth, 7.5 mg zopiclone just before going to sleep. In severe or persistent insomnia up to 15 mg may be needed. In elderly, start with a lower dose of 3.75 mg; subsequently the dose may be increased if the condition improves clinically

#### **Proprietary Preparation**

**Imovane** (*Sanofi*), Tab., 7.5mg, Tk. 10.00/Tab.  
**Hypnoclone**(*ACI*) Tab., 7.5mg, Tk. 4.02/Tab

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## 7.2 DRUGS USED IN PSYCHOSIS AND RELATED DISORDERS

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Behavioral and cognitive effects of psychotropic drugs have contributed much to a better understanding of the relationship between brain functions, psychiatric illnesses and their therapy. These drugs are useful for psychotic symptoms such as paranoia, delusion, hallucination, disordered thinking, and also in schizophrenia. They are known as psychotropic or anti-psychotic drugs, and also called as 'neuroleptics'. Modern psychotropic drugs have profoundly changed the treatment of psychiatric disorders.

Regardless of which antipsychotic drug is chosen for the treatment of a psychotic patient, it is important to be fully familiar with the pharmacology of the drug including its therapeutic and side-effect profile. Proper dosage of any of the therapeutic agents is a critical issue for its safe and effective application.

Antipsychotic drugs are thought to act by interfering with dopaminergic transmission or by blocking dopamine receptors in the brain. They may also affect cholinergic, alpha-adrenergic, histaminergic and serotonergic receptors in the brain. Differential effect of the various antipsychotic drugs on the storage, release, destruction and uptake or reuptake of either serotonin or norepinephrine may account for their differential efficacy in various psychotic or behavior disordered patients.

Many of the antipsychotic drugs are PHENOTHIAZINE derivatives which may be classified into three groups:

Group 1: **chlorpromazine** belongs to this group which is characterized by strong sedative effects and moderate antimuscarinic and extrapyramidal side-effects.

Group 2: **thioridazine** belongs to this group which is generally characterized by moderate sedative effects, marked antimuscarinic effects but fewer extrapyramidal side-effects than groups 1 and 3.

Group 3: **Fluphenazine, Prochlorperazine, and Trifluoperazine** belong to this group which is generally characterized by fewer sedative effects, fewer antimuscarinic effects, but more pronounced extrapyramidal side-effects than groups 1 and 2.

Psychotropic drugs of other chemical types tend to resemble the phenothiazines of Group 3. They include:

**BUTYROPHENONES** (e.g. haloperidol, droperidol);

**THIOXANTHINES** (e.g. flupenthixol, zuclopenthixol);

**SUBSTITUTED BENZAMIDES** (e.g. sulpiride; remazopride);

## 7. CENTRAL NERVOUS SYSTEM

### DIBENZODIAZEPINES(e.g.Clozapine).

Phenothiazines and related thioxanthenes and also butyrophenones block many types of neurotransmitter receptors including mainly the dopaminergic D<sub>2</sub>-receptors. Newer compounds like sulpiride and remazopride block D<sub>4</sub>-receptors in addition to blocking the D<sub>2</sub>-receptors.

Other atypical antipsychotics include **Aripiprazole**, **olanzapine** and **risperidone**. **Risperidone** which is indicated for psychosis in which both positive and negative symptoms are present, and **olanzapine** which is effective in maintaining clinical improvement in patients who have responded to initial treatment.

**Lithium salts** are a class by itself, and are used in the prophylaxis and treatment of mania, in the prophylaxis of manic depressive disorder and in the prophylaxis of recurrent unipolar depression. The decision to use lithium salts needs careful and special considerations of specialists. Lithium is unsuitable for children.

**WITHDRAWAL.** Withdrawal of antipsychotic drugs after long-term therapy should always be gradual and closely monitored to avoid the risk of acute withdrawal syndromes or rapid relapse.

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### ARIPIPRAZOLE

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**Indications:** schizophrenia, bipolar mania and mixed manic/depressive episodes and as adjunctive therapy for major depressive disorder

**cautions:** history of seizures, neuroleptic malignant syndrome, dementia, history of diabetes mellitus & hypertension

**Interactions:** see Appendix-2

**Side effects:** constipation, dizziness, drowsiness, headache, nausea, pain, restlessness, stomach upset

**Dose:** schizophrenia, by mouth, ADULT over 18 years, 10 - 15mg once daily, usual maintenance 15mg oncedaily; max. 30mg once daily

### Proprietary Preparations

**Aripiprazole (Aristada)**, Tab. 10 mg, Tk. 3.77/Tab.; 15 mg, Tk. 5.29/Tab.

**Aripiprazole (Aristada)**, Tab. 10 mg, Tk. 5.00/Tab.; 5 mg, Tk. 7.00/Tab.

**Aripiprazole (General)**, Tab. 10 mg, Tk. 5.02/Tab.; 5 mg, Tk. 3.51/Tab.

**Sizopra (Acme)**, Tab. 10 mg, Tk. 5.01/Tab.; 15 mg Tk. 7.02/Tab.

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### CHLORPROMAZINE HCl [ED]

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see also Section 7.8

**Indications:** schizophrenia, delusional disorder, mania, and aggressive behavior; other psychosis; emesis

**Cautions:** pregnancy, lactation, cardiovascular and cerebrovascular disease, respiratory disease, seizure

**Contraindications:** coma due to CNS depression, Parkinsonism, glaucoma, hepatic disease, jaundice, bone marrow depression, blood dyscrasias

**Interactions:** see Appendix-2

**Side-effects:** anorexia nervosa, sedation, postural hypotension, extrapyramidal symptoms (EPS), dry mouth, tachycardia, galactorrhoea, impaired ejaculation, amenorrhoea, constipation, weight gain, jaundice, agranulocytosis

**Dose:** 300–1500 mg per day.

### Proprietary Preparation

see section 7.8

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### CLOZAPINE

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**Indications:** only for the treatment of schizophrenia in patients unresponsive to, or intolerant of, conventional antipsychotic drugs

**Caution:** should not drive or operate any machinery

**Contraindications:** bone marrow depression, drug induced agranulocytosis; patients receiving carbamazepine, CNS depressants; renal or hepatic impairment; epilepsy; pregnancy and breastfeeding

**Interactions:** see Appendix-2

**Side-effects:** sedation, drowsiness, hypersalivation, postural hypotension,



## 7. CENTRAL NERVOUS SYSTEM

hyperthermia, constipation, weight gain, agranulocytosis, seizures with high doses

**Dose:** initially, 12.5 mg once on the first day followed by 25 mg on the second day, subsequently daily dose may be increased gradually, if well tolerated, by 25 mg up to 300 mg daily in divided doses.

### Proprietary Preparations

**Clozapin** (*Albion*), Tab., 100 mg, Tk.

9.00/Tab.; 25 mg, Tk. 2.55/Tab.

**Sensipin** (*Beximco*), Tab., 25 mg, Tk.

3.84/Tab.

**Sizopin** (*Sun*), Tab., 100 mg, Tk. 9.55/Tab.; 25

mg, Tk. 2.55/Tab.

**Zapenia** (*Incepta*), Tab., 100 mg, Tk.

9.00/Tab.; 25 mg, Tk. 2.50/Tab.

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### FLUPENTHIXOL

(Flupentixol)

**Indications:** schizophrenia, other psychoses, particularly with apathy and withdrawal but not in mania or hyperactivity; depression (see section 7.3)

**Contraindications:** parkinsonism, liver disease, blood dyscrasia, neuroleptic malignant syndrome, Tardive dyskinesia

**Interactions:** see Appendix-2

**Side-effects:** sedation, hypotension, extrapyramidal symptoms (EPS), amenorrhoea, galactorrhoea, loss of libido, weight gain

**Dose:** orally for psychosis, initially 0.5-3 mg twice daily adjusted according to response

ELDERLY (or debilitated), quarter to half of the adult dose

CHILD not recommended. *Intramuscularly*, see next entry for the depot injection of flupentixol decanoate

### Proprietary Preparations

**Funam** (*Amico*), Tab., 0.5 mg, Tk. 3.00/Tab.

**Sentix** (*Eskayef*), Tab, 1 mg, Tk. 5.00/Tab.; 0.5

mg, Tk. 3.00/Tab.

**Fluxanol**<sup>(1)</sup> (*Lundbeck*), Tab, 1mg, Tk. 16.79/

Tab.

Flupentixol 500 microgram Melitracen 10 mg

**Adelax** (*ACI*), Tab., Tk. 4.00/Tab.

**Amilax** (*Amico*), Tab., Tk. 4.00/Tab.

**Anfree** (*Aristo*), Tab., Tk. 5.00/Tab.

**Angenta** (*Healthcare*), Tab., Tk. 5.00/Tab.

**Antison** (*Asiatic*), Tab., Tk. 4.00/Tab.

**Anxicon** (*Veritas*), Tab., Tk. 5.00/Tab.

**Anzet** (*Popular*), Tab., Tk. 3.51/Tab.

**Benzit** (*Biopharma*), Tab., Tk. 4.00/Tab.

**Danxit** (*Astra*), Tab., Tk. 4.00/Tab.

**Deanxit** (*Popular*), Tab., Tk. 5.52/Tab.

**Deleta** (*General*) Tab., Tk. 5.00/Tab.

**Depresil** (*Rangs*), Tab., Tk. 4.00/Tab.

**Dexit** (*Unimed*), Tab., Tk. 4.00/Tab.

**Diconten** (*Drug Int.*), Tab., Tk. 4.00/Tab.

**Dinxi** (*Chemist*), Tab., Tk. 4.00/Tab.

**Dormir** (*Somatec*), Tab., Tk. 3.51/Tab.

**Eraxit** (*Pharmasia*), Tab., Tk. 4.00/Tab.

**Euphor** (*Biopharma*), Tab., Tk. 0.80/Tab.

**Exzilor** (*Sun*), Tab., Tk. 4.00/Tab.

**Femanol** (*Kemiko*), Tab., Tk. 4.00/Tab.

**Fluxit** (*Opsonin*), Tab., Tk. 3.76/Tab.

**Fmr** (*RAK*), Tab., Tk. 5.00/Tab.

**Frenxit** (*Beximco*), Tab., Tk. 5.00/Tab.

**Fulimet** (*Albion*), Tab., Tk. 3.50/Tab.

**Henixit** (*Hudson*), Tab., Tk. 4.00/Tab.

**Leanxit** (*Acme*), Tab., Tk. 5.00/Tab.

**Melanxit** (*Organic*), Tab., Tk. 4.00/Tab.

**Melixol** (*Square*), Tab., Tk. 5.00/Tab.

**Meltix** (*Navana*), Tab., Tk. 4.00/Tab.

**Melxit** (*Ziska*), Tab., Tk. 3.50/Tab.

**Metflu** (*MST*), Tab., Tk. 4.00/Tab.

**Mixit** (*Apex*), Tab., Tk. 3.50/Tab.

**Pentixol** (*Techno*), Tab., Tk. 3.00/Tab.

**Radex** (*Globe*), Tab., Tk. 4.00/Tab.

**Relux** (*Rephco*), Tab., Tk. 3.00/Tab.

**Remood** (*Ibn Sina*), Tab, Tk. 4.00/Tab.

**Renxit** (*Renata*), Tab., Tk. 4.00/Tab.

**Sensit** (*Eskayef*), Tab., Tk. 4.00/Tab.

**Stimo** (*Delta*), Tab., Tk. 3.50/Tab.

**Tenaxit** (*Incepta*), Tab., Tk. 4.00/Tab.

**Tensicon** (*White Horse*), Tab., Tk. 3.50/Tab.

**Thenxet** (*Pacific*), Tab., Tk. 3.01/Tab.

**Thixtra** (*Nipro JMI*), Tab., Tk. 5.00/Tab.

**Tixocin** (*Sharif*), Tab., Tk. 4.00/Tab.

**Tixol** (*Alco*), Tab., Tk. 4.00/Tab.

**U4** (*Orion*), Tab., Tk. 4.00/Tab.

**Xolitra** (*Beacon*), Tab., Tk. 4.00/Tab.

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### FLUPENTHIXOL DECANOATE

**Indications:** schizophrenia and other psychoses with depressive symptoms but not mania or any psychomotor hyperactivity

**Cautions, Contraindications, Side-effects, and Interactions:** see under *Flupentixol*

**Interactions:** see Appendix-2

**Dose:** depot Injection, by deep intramuscular injection into the gluteal

## 7. CENTRAL NERVOUS SYSTEM

muscle, initial test dose 20 mg, then after at least 7 days, 20-40 mg repeated at intervals of 2 to 4 weeks, adjusted according to response, max. 400 mg weekly; usual maintenance dose 50-100 mg every 4 weeks  
ELDERLY, initially quarter to half the adult dose;  
CHILD, not recommended

### Proprietary Preparation

**Fluanxol**<sup>®</sup> (Lundback), Inj., 20 mg/ml, Tk.349.15./amp, 40 mg/2 ml; Tk.511.08/amp;

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### FLUPHENAZINE DECANOATE<sup>[ED]</sup>

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**Indications:** maintenance therapy of schizophrenia and other psychoses

**Side-effects, Contraindications and Interactions:** see Appendix-2

**Dose:** by deep intramuscular injection into the gluteal muscle, test dose of 2.5 mg (6.25 mg in the elderly), then after 5-7 days 12.5–100 mg repeated at intervals of 2-5 weeks, adjusted according to response. CHILD, not recommended

### Proprietary Preparations

**Fenazine** (Incepta), Inj., 0.025 gm/ml, Tk. 75.00/Amp.  
**Fluphenazine**<sup>®</sup> (Rotex), Inj., 0.025 gm/ml, Tk. 90.35/Amp.

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### HALOPERIDOL<sup>[ED]</sup>

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**Indications:** schizophrenia, mania, other psychosis, Tourette's syndrome, autism, Huntington's Chorea, Sydenham's Chorea, delirium

**Cautions:** pregnancy, lactation, coadministration with lithium may cause neurotoxicity

**Contraindications:** parkinsonism, liver disease, depressive illness

**Interactions:** see Appendix-2

**Side-effects:** sedation, hypotension, EPS, amenorrhoea, loss of libido, constipation, retention of urine

**Dose:** orally 5–100 mg/day, adjusted according to response; ELDERLY, initially half of adult dose. CHILD, initially

25-50 micrograms/kg daily; adolescents up to 30 mg daily

By intramuscular injection 2–10 mg, subsequent dose given every 6–8 hours according to response, to a max. of 60mg daily; CHILD, not recommended  
*Depot Injection* (as Haloperidol Decanoate) by deep intramuscular injection into the gluteal muscle initially 50 mg every 4 weeks, if necessary increasing gradually up to 200 mg every 4 weeks

### Proprietary Preparations

**G-Haloperidol** (Gonosasthaya), Tab., 5 mg, Tk.0.40/Tab.  
**Halop** (Opsonin), Tab., 5 mg, Tk. 0.38/Tab.  
**Haloperidol** (Albion), Tab., 5 mg, Tk.1.00/Tab.  
**Halopid** (Incepta), Tab., 5 mg, Tk. 1.00/Tab.; Inj., 5 mg/ml, Tk. 10.80/Amp  
**Peridol** (Square), Tab., 5 mg, Tk. 1.00/Tab.  
**Perigen** (General), Inj., 5 mg/ml, Tk. 12.00/Amp;Tab., 5 mg, Tk. 1.00/Tab.  
**Perol** (Ambee), Tab., 5 mg, Tk. 0.51/ Tab.; Inj., 5 mg/5 ml, Tk. 10.04/1 ml Amp

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### LITHIUM CARBONATE<sup>[ED]</sup>

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**Indications:** treatment and prophylaxis of mania, bipolar mood disorder and recurrent depression; impulsive aggressive or self-mutilating behavior; see also notes above

**Cautions:** fever, sweating, driving, alcohol. To be used only under the supervision of a specialist

**Contraindications:** Cardiac, renal, thyroid or neurological dysfunction, blood dyscrasia, pregnancy and lactation

**Interactions:** see Appendix-2

**Side-effects:** hypersalivation, anxiety, drowsiness, malaise, polyuria, polydipsia, delirium, hypothyroidism, nausea, vomiting, diarrhoea, and renal failure

**Dose:** 800–2000 mg/day.ELDERLY 400 mg to 1 gram. CHILD; Not recommended.

### Proprietary Preparations

**Litiam** (ACI), ER Tab., 400 mg, Tk. 5/Tab.  
**Lithin** (Incepta), SR Tab., 400 mg, Tk. 5/Tab.  
**Lithosun** (Sun), SR Tab., 400 mg, Tk. 5.05/Tab.

## 7. CENTRAL NERVOUS SYSTEM

**Lithium** (*Albion*), SR Tab., 400 mg, Tk. 5.05/Tab.

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### OLANZAPINE

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**Indications:** schizophrenia, treatment of moderate to severe episodes of mania

**Cautions:** pregnancy, prostatic hypertrophy, paralytic ileus, hepatic or renal impairment, diabetes mellitus (risk of exacerbation or ketoacidosis), low leucocyte or neutrophil count, bone marrow depression, hypereosinophilic disorders, myeloproliferative disease, Parkinson's disease

**Contraindications:** angle closure glaucoma and breast-feeding

**Interactions:** see *Appendix-2*

**Side-effects:** mild, transient antimuscarinic effects; drowsiness, speech difficulty, exacerbation of Parkinson's disease, akathisia, asthenia, increased appetite, raised triglyceride concentration, oedema, hyperprolactinaemia (but clinical manifestations are rare), occasionally blood dyscrasias, rarely brady-cardia, rash, photosensitivity, diabetes mellitus, priapi-sm, hepatitis, pancreatitis

**Dose:** schizophrenia, combination therapy for mania, ADULT: Over 18 years, 10 mg daily adjusted to usual range of 5-20 mg daily; doses greater than 10 mg daily only after reassessment

Monotherapy for mania, ADULT over 18 years, 15 mg daily adjusted to usual range of 5-20 mg daily; doses greater than 15 mg only after reassessment

**Note.** When one or more factors present that might result in slower metabolism (e.g. female gender, elderly, non-smoker) consider lower initial dose and dose increase to be more gradual

#### **Proprietary Preparations**

**Deprex** (*Square*), Tab., 5 mg, Tk. 2.50/Tab.; 10 mg, Tk. 4.50/Tab.

**Lopez** (*General*), Tab., 10 mg, Tk. 4.52/Tab.; 5 mg, Tk. 2.51/Tab.

**Olanap** (*Incepta*), Tab., 10 mg, Tk. 4.50/Tab.; Tab., 5 mg, Tk. 2.50/Tab.

**Olanza** (*Albion*), Tab., 10 mg, Tk. 4.52/Tab.

**Oleanz** (*Sun*), Tab., 10 mg, Tk. 4.55/Tab.; 5 mg, Tk. 2.55/Tab.

**Pericam** (*Beximco*), Tab., 10 mg, Tk. 2.51/Tab.; 5 mg, Tk. 1.50/Tab.

**Xytrex** (*ACI*), Tab., 5 mg, Tk. 2.51/Tab.; 10 mg, Tk. 4.50/Tab.

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### PROCHLORPERAZINE

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(see section 7.8)

**Indications:** schizophrenia, emesis (see also section 7.5.4.1)

**Contraindications:** parkinsonism, liver disease

**Interactions:** see *Appendix-2*

**Side-effects:** sedation, EPS

**Dose:** orally, short-term management of psychomotor agitation, 100–200 mg 4 times daily; CHILD, not recommended. As antiemetic, 5-15 mg daily

By *intramuscular injection*, for short-term adjunctive management of psychomotor agitation, 50 mg (25 mg in elderly), repeated if necessary. CHILD, not recommended

#### **Proprietary Preparations**

**Almetil** (*Albion*), Tab., 5 mg, Tk. 0.30/Tab.

**Ametil** (*Aristo*), Tab., 5 mg, Tk. 0.46/Tab.

**Avotil** (*Rephco*), Tab., 5 mg, Tk. 0.30/Tab.

**Emitab** (*Sonear*), Tab., 5 mg, Tk. 0.46/Tab.

**Promtil** (*Square*), Inj., 12.5 mg/ml, Tk. 5.00/Amp.; Tab., 5 mg, Tk. 0.46/Tab.

**Stemetil** (*Sanofi*, Inj., 12.5 mg/ml, Tk. 5.00/Amp.; Tab., 5 mg, Tk. 0.46/Tab.

**Vergon** (*Opsonin*), Inj., 12.5 mg/ml, Tk. 3.76/Amp.; Tab., 5 mg, Tk. 0.35/Tab.

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### QUETIAPINE

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**Indications:** bipolar disorder, schizophrenia, major depressive disorder, Alzheimer's disease

**Cautions:** behavioral disorders in elderly patients with dementia, less than 18 years old.

**Contraindications:** hypersensitivity to quetiapine

**Interactions:** see *Appendix-2*

**Side effects:** drymouth, dizziness, headache, somnolence, constipation, asthenia, tremor, peripheral oedema, Stevens-Johnson syndrome

## 7. CENTRAL NERVOUS SYSTEM

**Dose:** ADULT: 50 mg.daily for bipolar disorder; 25 mg orally once a day for schizophrenia

### Proprietary Preparations

**Qmax** (ACI), Tab., 100 mg, Tk. 10.00/Tab.; 25 mg, Tk. 3.00/Tab.  
**Qpine** (Sanofi), Tab., 100 mg, Tk. 10.04/Tab.; 200 mg, Tk. 18.00/Tab.; 25 mg, Tk. 3.01/Tab.  
**Quetinil** (Albion), Tab., 100 mg, Tk. 10.50/Tab.  
**Quiet** (Incepta), Tab., 100 mg, Tk. 10.00/Tab.; Tab., 25 mg, Tk. 3.00/Tab.  
**Qutipin** (Sun), Tab., 100 mg, Tk. 10.05/Tab.; 25 mg, Tk. 3.00/Tab.  
**Seroquet** (Unimed), Tab., 100 mg, Tk. 10.00/Tab.; 25 mg, Tk. 3.00/Tab.  
**Tiapine** (General), Tab., 100 mg, Tk. 10.04/Tab.; 25 mg, Tk. 3.00/Tab.

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### RISPERIDONE

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**Indications:** acute and chronic psychoses, especially for psychoses in which both positive and negative symptoms are present

**Cautions:** parkinson's disease; pregnancy; hepatic or renal impairment

**Contraindication:** breast-feeding

**Interactions:** see Appendix-2

**Side-effects:** insomnia, agitation, anxiety, headache, drowsiness, impaired concentration, fatigue, blurred vision, constipation, nausea and vomiting, dyspepsia, abdominal pain, hyperprolactinaemia (with galactorrhoea, menstrual disturbances, amenorrhoea, gynaecomastia), sexual dysfunction, priapism, urinary incontinence, tachycardia, hypertension, rash, rhinitis, cerebrovascular accidents, neutropenia and thrombocytopenia

**Dose:** 2 mg in 1-2 divided doses on first day, then 4 mg in 1-2 divided doses on second day (slower titration appropriate in some patients); usual dose range 4-6 mg daily; doses above 10 mg daily only if benefit considered to outweigh risk (max. 16 mg daily). ELDERLY (or in hepatic or renal impairment), initially 500 micro-grams twice daily to 1-2 mg twice daily. CHILD under 15 years not recommended

### Proprietary Preparations

**Frenia** (Incepta), Tab., 1 mg, Tk.2.00/Tab.; 2 mg, Tk. 3.00/Tab.; 4 mg, Tk.5.50/Tab.  
**Resco** (Drug Int.), Tab., 1 mg, Tk. 1.50/Tab.; 2 mg, Tk.2.00/Tab.  
**Riscord** (General), Tab., 1 mg, Tk.2.00/Tab.; 2 mg, Tk.3.00/Tab.; 4 mg, Tk.5.50/Tab.  
**Risdon** (Unimed), Tab., 1 mg, Tk.3.00/Tab.; 2 mg, Tk.5.00/Tab.; 4 mg, Tk.9.00/Tab.  
**Rislock** (Albion), Tab., 1 mg, Tk.1.50/Tab.; 2 mg, Tk.3.00/Tab.; 4 mg, Tk.9.00/Tab.  
**Rispa** (Orion), Tab., 1 mg, Tk.3.00/Tab.; Tab., 2 mg, Tk.5.00/Tab.  
**Risperdalconsta**<sup>®</sup> (Cilag), Inj., 25mg/vial, Tk. 9413.42/vial; 37.50mg /vial, Tk. 12521.23/vial; 50mg /vial, Tk.18826.82/vial  
**Risperdex** (Opsonin), Tab., 1 mg, Tk.1.14/Tab.; 2 mg, Tk.1.51/Tab.  
**Rispolux** (Novartis), Tab., 1 mg, Tk.10/Tab.; 2 mg, Tk.5.10/Tab.; 4 mg, Tk. 9.10/Tab.  
**Sizodon** (Sun), Tab., 1 mg, Tk.3.00/Tab.; 2 mg, Tk.6.00/Tab.; 4 mg, Tk.9.00/Tab.  
**Sperdal** (Sanofi), Tab., 1 mg, Tk.2.50/Tab.; 2 mg, Tk.3.00/Tab.; 4 mg, Tk.5.00/Tab.

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### SULPIRIDE

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**Indication:** schizophrenia

**Cautions:** pregnancy and lactation

**Contraindications:** parkinsonism, depression, blood dyscrasia, liver disease, Tardive dyskinesia, neuroleptic malignant syndrome, pheochromocytoma

**Interactions:** see Appendix-2

**Side-effects:** sedation, hypotension, EPS, galactorrhoea, amenorrhoea

**Dose:** 200 - 400 mg twice daily

ELDERLY : low initial dose to be increased gradually according to response. CHILD, under 14 years not recommended

### Generic Preparation

Tablet, 200mg

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### TRIFLUPERAZINE

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**Indications:** schizophrenia and other psychoses; short-term management of severe anxiety

**Contraindications:** parkinsonism, blood dyscrasia, liver disease

**Interactions:** see Appendix-2

## 7. CENTRAL NERVOUS SYSTEM

**Side-effects:** sedation, hypotension, extrapyramidal symptoms, dry mouth, constipation, tachycardia, galactorrhoea, amenorrhoea, impaired ejaculation, cardiac arrhythmia

**Dose:** schizophrenia and psychoses, initially 5 mg twice daily (half in the elderly), increased by 5 mg after one week, then at intervals of 3 days, according to response, max. 60mg daily. Short-term adjunctive for management of severe anxiety, 2–4 mg daily in divided doses

### Proprietary Preparations

**Flurazine** (*Incepta*), Tab., 1 mg, Tk. 1.50/Tab.; 5 mg, Tk. 2.50/Tab.

**Sizonil** (*Healthcare*), Tab., 5 mg, Tk. 3/Tab.; 1mg, Tk. 2/Tab.

**Stela** (*Delta*), Tab., 1 mg, Tk.1.50/Tab.; 5 mg, Tk. 2.50/Tab.

**Telazine** (*Eskayef*), Tab., 1 mg, Tk. 2/Tab.; 5mg, Tk. 3/Tab.

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### ZUCLOPENTHIXOL DECANOATE

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**Indications:** psychoses, especially schizophrenia with agitation and aggression

**Contraindications, Side-effects & Cautions:** as for chlorpromazine HCl

**Interactions:** see Appendix-2

**Dose:** By deep intramuscular injection into the upper outerbuttock or lateral thigh, test dose 100 mg, followed after at least 7 days by 200–500mg or more, repeated at intervals of 1–4 weeks, adjusted according to response; max. 600 mg weekly; ELDERLY quarter to half usual starting dose;

**Note:** CHILD, not recommended.

### Proprietary Preparations

**Clopixol Depot**<sup>(1)</sup> (*Lundback*), Inj. 200mg/1ml. Tk.511.08/vial

**Clopixol Acuphase**<sup>(1)</sup> (*Lundback*), Inj. 50mg/2ml. Tk.736.82/vial; 50mg/ml; Tk.552.61/vial

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### ZUCLOPENTHIXOL HYDROCHLORIDE

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**Indications, Side-effects & Contraindications:** as under *Chlorpromazine hydrochloride*.

**Interactions:** see Appendix-2.

**Dose:** orally, initially 20-30 mg daily in divided doses, increasing to a max. of

150 mg daily if necessary; usual maintenance dose 20-50 mg daily. ELDERLY (or debilitated) initially quarter to half the adult dose.

CHILD: not recommended.

### Proprietary Preparation

**Copixol**<sup>(1)</sup> (*Lundback*), Tab. 10mg., Tk.8.05/Tab (*Depot Injection:* see under *Zuclopenthixol Decanoate* below).

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## 7.3 ANTIDEPRESSANT DRUGS

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The major drugs that are used to treat depressive illness may be classified as follows;

- A. Tricyclic and related antidepressant drugs (e.g. **amitriptyline, imipramine, nortriptyline, maprotiline, mianserin**)
- B. Selective serotonin (5-HT) re-uptake inhibitors or SSRIs (e.g. **citalopram, duloxetine, fluoxetine, milnacipran, sertraline**)
- C. Monoamine-oxidase inhibitors or MAOIs (e.g. **phenelzine, tranylcypromine, moclobemide**) and
- D. Other antidepressant drugs (e.g. **venlafaxine and mirtazapine**)

Tricyclic and related antidepressants and SSRIs are preferred to the traditional MAOIs because they are more active and do not show the dangerous interactions with certain foods and other drugs.

Though MAOIs have largely been replaced by other antidepressant drugs, phobic and depressed patients with atypical features may respond to MAOIs. Though phenelzine is still used, tranylcypromine is not usually prescribed because of its stimulant action. Moclobemide is a reversible MAOI acting by reversible inhibition of MAO type A; it should be reserved only as a second line treatment for major depression and social phobia.

It is assumed that depression results from functionally deficient monoaminergic transmission in the CNS and antidepressant drugs may facilitate brain monoaminergic transmission.

**Flupenthixol**, an antipsychotic drug (see section 7.2) also acts as an antidep-

## 7. CENTRAL NERVOUS SYSTEM

ressant when used in a low dose (1-3 mg daily)

CAUTION. Hyponatraemia has been associated with all types of antidepressants (especially in the elderly and possibly due to inappropriate secretion of antidiuretic hormone), and should be considered in all patients who develop drowsiness, confusion or convulsions while taking an antidepressant drug.

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### TRICYCLIC AND RELATED ANTIDEPRESSANT DRUGS

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Tricyclic antidepressants are most effective for treating moderate to severe endogenous depression associated with psychomotor and physiological changes (such as loss of appetite and sleep disturbances); they include **imipramine, amitriptyline, and nortriptyline. maprotiline, mianserin and trazodone** are antidepressant drugs related to the tricyclics.

**Imipramine** and **amitriptyline** are well-established drugs and relatively safe and effective. Imipramine has less sedative properties than amitriptyline. Mianserin and trazodone have less antimuscarinic and cardiac side-effects than imipramine and amitriptyline.

**Note:** Limited quantities of tricyclic or related antidepressants should be prescribed at any time because they are dangerous in overdosage.

WITHDRAWAL; Tricyclic and related antidepressants should be withdrawn slowly, if possible.

**Duloxetine** serotonin-norepinephrine reuptake inhibitor (SNRI). It is prescribed for major depressive disorder and generalized anxiety disorder (see section 5.2.4)

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### AMITRIPTYLINE HCl<sup>[ED]</sup>

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**Indications:** depressive illness, mixed anxiety with depression, nocturnal enuresis in children

**Cautions:** cardiac disease, pregnancy, history of mania

**Contraindications:** recent myocardial infarction, arrhythmia, liver disease, manic phases, renal failure, enlarged

prostate, co-administration with MAO inhibitors

**Interactions:** see Appendix-2

**Side-effects:** dry mouth, sedation, blurred vision, increased intraocular pressure, constipation, nausea, difficulty with micturition, cardiovascular side effects, ECG changes, arrhythmia, postural hypotension, tachycardia, syncope particularly with high dose, hypersensitivity reactions, hypomania or mania, confusion (particularly in elderly), disturbances with sexual function

**Dose:** by mouth initially 75 mg daily in divided dose or as a single dose at bed time (in ELDERLY 30-50 mg daily). Increased gradually as necessary to maximum 150mg

CHILD, nocturnal enuresis, 7-10 years: 10-20 mg at night; 11-16 years: 25-50mg at night.

### Proprietary Preparations

**Amit** (General), Tab., 10 mg, Tk. 0.85/Tab.; 25 mg, Tk. 1.75/Tab.

**Amitriptyline** (GSK), Tab., 25 mg, Tk. 0.70/Tab.

**Amilin** (Opsonin), Tab., 10 mg, Tk. 0.64/Tab.; 25 mg, Tk. 0.75/Tab.

**Reptylin** (Albion), Tab., 10 mg, Tk. 0.55/Tab.; 25 mg, Tk. 1.00/Tab.

**Tryptin** (Square), Tab., 10 mg, Tk. 0.85/Tab.; 25 mg, Tk. 1.75/Tab.

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### IMIPRAMINE HYDROCHLORIDE

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**Indications:** depressive disorder, panic disorder, phobic disorder, enuresis, attention deficit disorder, narcolepsy, chronic pain

**Cautions:** pregnancy, administration along with MAO inhibitors

**Contraindications:** myocardial infarction, glaucoma, enlarged prostate, liver disease

**Side-effects:** sedation, dry mouth, tachycardia, constipation, decreased libido

**Interactions:** see Appendix-2

**Dose:** 75-300mg/day

CHILD: not recommended for use for depression; for nocturnal enuresis, 7-11 years 25-50 mg, over 11 years 50-75mg

## 7. CENTRAL NERVOUS SYSTEM

### **Proprietary Preparations**

**Depram** (*Square*), Tab., 25 mg, Tk. 4.00/Tab.

**Pinor** (*Aristo*), Tab., 25 mg, Tk. 4.00/Tab.

**Pramin** (*Incepta*), Tab., 25 mg, Tk. 2.00/Tab.

**Tofranil** (*Novartis*), Tab., 25 mg, Tk. 5.50/Tab.

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### **MAPROTILINE HYDROCHLORIDE**

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It is a selective noradrenergic (NA) uptake inhibitor, also having moderate antihistaminic properties but has less anticholinergic effects than imipramine.

**Indications:** depressive disorders where sedation is required, depression on late onset, neurotic or reactive depression; depressive mood disorders characterized by anxiety, dysphoria, irritability, apathetic condition, bipolar depressive disorder

**Contraindications:** hypersensitivity to the drug itself, epilepsy or lowered convulsive threshold; recent myocardial infarction, cardiac conduction defects e.g., bundle branch block, glaucoma, prostatic hypertrophy, pregnancy, lactation, liver disease

**Interactions:** MAOIs, antihypertensives, sympathomimetics, anticholinergic agents, anticonvulsants, alcohol, anticoagulants, antidiabetics, *epilepsy*; also see *Appendix-2*

**Side-effects:** sedation, postural hypotension, inhibition of ejaculation, reflex tachycardia, nasal congestion, weight gain, drowsiness, constipation, dry mouth, fine tremor, akathisia, headache, lowering of seizure threshold, less anticholinergic effects, disturbances of cardiac conduction occasionally

**Dose:** Initially 25 mg once daily, then increasing gradually according to therapeutic response up to 75-150 mg daily. In elderly reduce to 75 mg daily depending on the patient's response. More than 200 mg has been associated with a higher incidence of seizures than with the usual dosage of tricyclic treatment

**Overdosage:** severe anticholinergic and cardiotoxic effects such as ataxia, restless, drowsiness, convulsions, arrhythmia, convulsions, hypotension, respir-

atory depression, muscle twitching, stupor, coma. There is no specific antidote. Transfer patient to the hospital for intensive care

### **Proprietary Preparation**

**Ludiomil** (*Novartis*), Tab. 25mg, Tk.4/Tab

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### **NORTRIPTYLINE**

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**Indications:** depressive disorders; nocturnal enuresis in children

**Cautions:** cardiovascular disease, H/O convulsion

**Contraindications:** myocardial infarction, enlarged prostate, pregnancy, liver disease, glaucoma, simultaneous administration with MAO inhibitor

**Interactions:** see *Appendix-2*

**Side-effects:** sedation, dry mouth, tachycardia, constipation, tremor, confusion

**Dose:** depression, initial low dose increased as necessary to 75-100 mg daily in divided doses or as a single dose; ELDERLY, 30-50 mg daily in divided doses

**Compound Preparation:** Fluphenazine HCl 0.5 mg + Nortriptyline 10 mg (per tablet) 2-3 time daily for 3 months.

For nocturnal enuresis, CHILD 7 years, 10 mg, 8-11 years 10-20 mg, over 11 years 25-35 mg at night; max. period of treatment 3 months; CHILD:Not recomm-ended for depression in children.

### **Proprietary Preparations**

**Nortin** (*Navana*), Cap., 10 mg, Tk. 1.00/Cap.; 25 mg, Tk. 1.50/Cap.

Compound preparations (Fluphenazine hydrochloride 0.5 mg with nortriptyline hydrochloride 10 mg):

**Amival-F** (*Amico*), Tk. 2.01/Tab. Tk. 0.80/Tab.

**Moodon** (*Ibn Sina*), Tab. Tk. 0.85/Tab.

**Sanit** (*Square*), Tab. Tk. 0.80/Tab.

**Anflu** (*Alco*), Tab. Tk. 0.75/Tab.

**Apresin** (*Beximco*), Tab. Tk. 1.05/Tab.

**Flutrip** (*General*), Tab. Tk. 0.71/Tab.

**Norflu** (*Acme*), Tab. Tk. 1.06/Tab.

**Permival** (*Opsonin*), Tab. Tk.0.57/Tab.

**Norzin** (*Aristo*), Tab. Tk. 1.05/Tab.

## 7. CENTRAL NERVOUS SYSTEM

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### SELECTIVE SEROTONIN (5-HT) RE-UP TAKE INHIBITORS

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Selective serotonin (5-HT) re-uptake inhibitors (SSRIs) such as **Citalopram**, **Fluoxetine** (see sec 7.9) **Paroxetine** and **Sertraline** are effective as antidepressants. SSRIs are less sedating and have fewer antimuscarinic and cardiotoxic side effects than tricyclic antidepressants.

These drugs should be avoided in patients with epilepsy (prolonged seizures reported with fluoxetine). SSRIs should not be used if the patient enters a manic phase. These drugs may also interfere with performance of skilled tasks (e.g. driving).

**Interactions:** Citalopram, fluoxetine, Sertaline should not be started until 2 weeks after stopping an MAOI. Conversely, an MAOI should not be started until at least a week after these drugs have been stopped.

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### CITALOPRAM

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**Indications:** depressive illness, panic disorder

**Cautions:** epilepsy (avoid if poorly controlled, discontinue if convulsions develop), concurrent electroconvulsive therapy, history of mania, cardiac disease, diabetes mellitus, angle-closure glaucoma, concomitant use of drugs that increase risk of bleeding, history of bleeding disorders (especially gastrointestinal bleeding), hepatic and renal impairment, pregnancy and breast-feeding. Abrupt withdrawal should be avoided (has been associated with headache, nausea, paraesthesia, dizziness and anxiety)

**Contraindications:** should not be used if the patient enters a manic phase

**Interactions:** see notes above

**Side-effects:** palpitations, tachycardia, postural hypotension, coughing, yawning, confusion, impaired concentration, amnesia, migraine, paraesthesia, taste disturbance, increased salivation, rhinitis, tinnitus, micturition disorders

have been reported and see *also appendix-2*

**Dose:** depressive illness, 20 mg daily as a single dose in the morning or evening, increased if necessary up to 60 mg daily; ELDERLY, max. 40 mg daily; CHILD, not recommended

Panic disorder, initially 10 mg daily increased to 20 mg after a week, usual dose 20-30 mg daily; CHILD, not recommended

#### **Proprietary Preparations**

**Arpolax** (*Incepta*), Tab. 20 mg, Tk. 8.00/Tab.

**Citapram** (*General*), Tab. 10 mg, Tk. 5.02/Tab.; Tab. 20 mg, Tk. 8.03/Tab.

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### ESCITALOPRAM

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**Indications:** depressive illness, panic disorder, social anxiety disorder

**Cautions:** epilepsy, history of mania, cardiac disease, diabetes mellitus, angle closure glaucoma, hepatic impairment, renal impairment, breast feeding, abrupt withdrawal should be avoided

**Contraindications :** should not be used if the patient enters a manic phase. Adolescent & Child under 18 yrs not recommended

**Interactions :** see *Appendix-2*

**Side-effects:** nausea, vomiting, dyspnoea, abdominal pain, diarrhoea, constipation, anorexia with weight loss and hypersensitivity reactions possibly associated with vasculitis. Suicidal tendency

**Dose :** depressive illness, 10mg once daily, increased if necessary to max 20mg daily; elderly initially half the adult dose, lower maintenance dose may be sufficient; panic disorder, initially 5mg daily increased to 10mg daily after 7 days, max 20mg daily

#### **Proprietary Preparations**

**Citalex** (*Opsonin*), Tab., 10 mg, Tk. 6.04/Tab.

**Citalon** (*Popular*), Tab., 10 mg, Tk. 8.03/Tab.

**Epram** (*Albion*), Tab., 10 mg, Tk. 10.00/Tab.; 5 mg, Tk. 5.52/Tab.

**Esipram** (*Incepta*), Tab., 10 mg, Tk. 10.00/Tab.; 5 mg, Tk. 5.50/Tab.



## 7. CENTRAL NERVOUS SYSTEM

**Esita** (*Healthcare*), Tab., 5 mg, Tk. 7.00/Tab.; 10 mg, Tk. 12.00/Tab.  
**Losita** (*Eskayef*), Tab., 10 mg, Tk. 10.00/Tab.; Tab., 5 mg, Tk. 6.00/Tab.  
**Meliva** (*Jayson*), Tab., 10 mg, Tk. 8.03/Tab.  
**Nexcital** (*Unimed*), Tab., 10 mg, Tk. 10.00/Tab.; 5 mg, Tk. 5.50/Tab.  
**Nexito** (*Sun*), Tab., 10 mg, Tk. 10/Tab.; 5mg, Tk. 5.50/Tab.  
**Oxapro** (*Square*), Tab., 10 mg, Tk. 10/Tab.; Tab., 5 mg, Tk. 5.52/Tab.  
**S-Citapram** (*General*), Tab., 10 mg, Tk. 10.04/Tab.; 5 mg, Tk. 7/Tab.  
**Seropam** (*Beximco*), Tab., 10 mg, Tk. 8/Tab.; 5 mg, Tk. 5.50/Tab.  
**Talopram** (*Navana*), Tab., 10 mg, Tk. 8/Tab.; 5 mg, Tk. 5/Tab.

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### FLUOXETINE

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**Indications:** *see under dose*

**Cautions:** epilepsy (avoid if poorly controlled, discontinue if convulsions develop), concurrent electroconvulsive therapy, history of mania, cardiac disease, diabetes mellitus, angle-closure glaucoma, concomitant use of drugs that increase risk of bleeding, history of bleeding disorders (especially gastrointestinal bleeding), hepatic and renal impairment, pregnancy and breast-feeding

**Contraindications:** should not be used if the patient enters a manic phase.

**Interactions:** *see notes above*

**Side-effects:** possible changes in blood sugar, fever, neuroleptic malignant syndrome-like event; also reported (no causal relationship established), abnormal bleeding, aplastic anaemia, haemolytic anaemia, cerebrovascular accident, ecchymoses, eosinophilic pneumonia, gastrointestinal haemorrhage, pancreatitis, pancytopenia, thrombocytopenia, thrombocytopenic purpura, vaginal bleeding on withdrawal, violent behaviour; hair loss be also reported. Hypersensitivity including angioedema and other allergic reactions have also been reported

**Dose:** depressive illness, 20 mg daily, CHILD not recommended. Bulimia nervosa, 60 mg daily; CHILD not recommended

Obsessive-compulsive disorder, initially 20 mg daily; may be increased if no response after several weeks; max. 60 mg daily; CHILD not recommended.

Premenstrual dysphoric disorder, 20 mg daily for 6 months, then reassess for benefit before continuing.

**LONG DURATION OF ACTION.** Long half-life of fluoxetine should be considered when adjusting dosage (or in overdosage)

#### **Proprietary Preparations**

**Modipran** (*Beximco*), Cap., 20 mg, Tk. 2.89/Cap.

**Seren** (*Sonear*), Cap., 20 mg, Tk. 2.87/Cap.

**Prolert** (*Square*), Cap., 20 mg, Tk. 3.00/Cap.

**Nodep** (*General*), Cap., 20 mg, Tk. 2.80/Cap.

**Prodep** (*Sun*), Cap., 20 mg, Tk. 3.00/Cap.

**Fluoxetine** (*Albion*), Cap., 20 mg, Tk.

2.58/Cap.

**Nodepress** (*Kemiko*), Cap., 20 mg, Tk.

2.60/Cap.

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### MILNACIPRAN

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**Indications:** fibromyalgia

**Cautions:** emergence of delirium, psychosis

**Contraindications:** Known hypersensitivity, patients under 15 years of age, advanced renal disease BPH, hypertension and heart disease, open angle glaucoma, pregnancy

**Interactions :** *see Appendix-2*

**Side-effects:** nausea, headache, constipation, dizziness, insomnia, hot flush, hyperhidrosis, palpitations, dry mouth and hypertension

**Dose:** ADULT: Initial dose on day 1: 12.5 mg once daily

Days 2 and 3: 12.5 mg twice daily

Days 4 through 7: 25 mg twice daily

After day 7: 50 mg twice daily

#### **Proprietary Preparations**

**Milran** (*Beacon*), Tab., 12.50 mg, Tk.

6.00/Tab.; 50 mg, Tk. 15.00/Tab.

**Neocipran** (*Ibn Sina*), Tab., 50 mg, Tk.

15.00/Tab.

## 7. CENTRAL NERVOUS SYSTEM

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### PAROXETINE

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**Indications:** depression, obsessive-compulsive disorder, post-traumatic stress disorder and premenstrual dysphoric disorder

**Contraindications:** pregnancy and patients under 18

**Side effects:** belching, decreased appetite, decreased sexual ability, heartburn, tenderness around the eyes and cheekbones, unusual drowsiness

**Dose:** Initial dose: 20 mg orally once a day with or without food, usually in the morning. Maintenance dose: 20 to 50 mg orally once a day with or without food, usually in the morning.

#### **Proprietary Preparations**

**Oxat** (*Square*), Tab., 20 mg, Tk. 12.00/Tab.

**Parotin** (*ACI*), Tab., 20 mg, Tk. 10.04/Tab.; 10mg, Tk. 6.02/Tab.

**Paroxet** (*Jayson*), Tab., 20 mg, Tk. 9.03/Tab.

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### SERTRALINE

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**Indications:** depressive illnesses; see also under dose

**Cautions:** epilepsy concurrent electroconvulsive therapy, history of mania, cardiac disease, diabetes mellitus, angle-closure glaucoma, concomitant use of drugs that increase risk of bleeding, history of gastro intestinal bleeding; hepatic and renal impairment, pregnancy and breast-feeding; may impair performance of skilled tasks (e.g. driving)

**Interactions:** see notes above

**Side-effects:** tachycardia, confusion, amnesia, aggressive behaviour, psychosis, pancreatitis, hepatitis, jaundice, liver failure, menstrual irregularities, paraesthesia; thrombocytopenia

**Contraindications:** should not be used if patient enters a manic phase

**Dose:** depressive illness, initially 50 mg daily, increased if necessary by increments of 50 mg over several weeks to max. 200 mg daily; usual maintenance dose 50 mg daily; CHILD not recommended

Obsessive-compulsive disorder: for ADULT and ADOLESCENT over 13 years, initially 50 mg daily, increased if necessary in steps of 50 mg over several weeks; usual dose range 50-200 mg daily; CHILD 6-12 years initially 25 mg daily, increased to 50 mg daily after 1 week, further increased if necessary in steps of 50 mg at intervals of at least 1 week (max. 200 mg daily); CHILD under 6 years not recommended

Post-traumatic stress disorder, initially 25 mg daily, increased after 1 week to 50 mg daily; if response is partial and if drug is tolerated, dose is increased in steps of 50 mg over several weeks to max. 200 mg daily

#### **Proprietary Preparations**

**Andep** (*Healthcare*), 50 mg, Tk. 5.50/Tab.

**Atralin** (*Beximco*), Tab. 50 mg, Tk. 5.00/Tab.

**Chear** (*ACI*), Tab., 50 mg, Tk. 6.02/Tab., 25 mg, Tk. 3.01/Tab.; 100 mg, Tk. 10.04/Tab.

**Mudiral** (*Opsonin*), Tab., 100 mg, Tk. 6.79/Tab.; 25 mg, Tk. 2.26/Tab. 50 mg, Tk. 4.53/Tab.

**Repose** (*Incepta*), Tab., 100 mg, Tk. 9.50/Tab.; 25 mg, Tk. 3.00/Tab.; Tab., 50 mg, Tk. 6.00/Tab.

**Sartra** (*Pacific*), Tab., 50 mg, Tk. 4.51/Tab.

**Selotin** (*White Horse*), Tab., 50 mg, Tk. 5.00/Tab.

**Serlin** (*Ibn Sina*), Tab., 25 mg, Tk. 3.00/Tab.; Tab., 50 mg, Tk. 6.00/Tab.

**Serolux** (*Novartis*), Tab., 100 mg, Tk.

11.10/Tab.; 25 mg, Tk. 4.00/Tab.; Tab., 50 mg, Tk. 7.00/Tab.

**Sertal** (*Drug Int.*), Tab., 50 mg, Tk. 5/Tab.

**Sertalin** (*Popular*), Tab., 50 mg, Tk. 6.02/Tab.

**Sertiin** (*Albion*), Tab. 50 mg, Tk. 6.00/Tab.

**Setra** (*General*), Tab., 100 mg, Tk. 10.04/Tab.; Tab., 25 mg, Tk. 3.01/Tab.; 50 mg, Tk. 6.02/Tab.

**Zosert** (*Sun*), Tab., 1 mg, Tk. 10/Tab.; 25mg, Tk. 3.00/Tab.; 50 mg, Tk. 6.00/Tab.

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### OTHER ANTIDEPRESSANT DRUGS

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#### MIRTAZAPINE

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**Indication:** depressive illness

**Cautions:** epilepsy, hepatic and renal impairment, hypotension, history of urinary retention and bipolar depression, avoid abrupt withdrawal; pregnancy and breast-feeding

## 7. CENTRAL NERVOUS SYSTEM

**Interactions:** see *Appendix-2*

**Side-effects:** increased appetite and weight gain, sedation; abnormal dreams, tremor, myoclonus, paraesthesia, arthralgia, myalgia, reversible agranulocytosis

**Dose:** initially 15 mg daily at bed time increased according to response up to 45 mg daily as a single dose at bedtime or in 2 divided doses; CHILD not recommended

### **Proprietary Preparations**

**Mirapin** (*Beacon*), Tab., 15 mg, Tk. 9/Tab.

**Mirtaz** (*Sun*), Tab., 15 mg, Tk. 8.05/Tab.; 30 mg, Tk. 15.00/Tab.

**Mirzalex** (*Novartis*), Tab., 15 mg, Tk. 10.00/Tab.; 30 mg, Tk. 18.00/Tab.

**Mitaprex** (*Incepta*), Tab., 15 mg, Tk. 8.00/Tab.; 30 mg, Tk. 15.00/Tab.

**Mitrazin** (*General*), Tab., 15 mg, Tk. 8.03/Tab.; 30 mg, Tk. 15.00/Tab.

**Trazapin** (*Albion*), Tab., 15 mg, Tk. 8.00/Tab.

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## VENLAFAXINE

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**Indications:** depressive illness, generalised anxiety disorder

**Cautions:** history of myocardial infarction or unstable heart disease, epilepsy, mania, hepatic or renal impairment; glaucoma; avoid abrupt withdrawal ;driving.

**SKIN REACTION.** Advise patients to contact doctor if rash, urticaria or related allergic reaction develops.

**Contraindications:** severe hepatic or renal impairment; pregnancy and breast-feeding

**Interactions:** see *Appendix-2*

**Side-effects:** nausea, constipation, dry mouth, headache, insomnia, drowsiness, dizziness, asthenia, nervousness, sweating, sexual dysfunction; hypertension, palpitations, dyspnoea, chills, tinnitus, tremor, hypertonia, psychiatric disturbances, increased urinary frequency, arthralgia, myalgia, visual disturbances, ecchymoses, photosensitivity, hyponatraemia; neuroleptic malignant syndrome, Stevens-Johnson syndrome.

**Dose:** depression, initially 75 mg daily in 2 divided doses, increased if necessary after several weeks to 150 mg daily in 2 divided doses

Severely depressed or hospitalized patients, initially 150 mg daily in 2 divided doses, increased if necessary in steps of up to 75 mg every 2-3 days to max. 375 mg daily, then gradually reduced; ADOLESCENT and CHILD under 18 years not recommended

### **Proprietary Preparations**

**Veniz XR** (*Sun*), XR Cap., 75 mg, Tk.10/Cap.

**Venlax** (*General*), Tab., 37.5 mg, Tk.5.52/Tab ; 75 mg, Tk.10.04/Tab.

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## 7.4 DRUGS USED IN SUBSTANCE DEPENDENCE

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(see also *Appendix-1e*)

**Alcohol dependence:** Benzodiazepines are drugs of choice for alcohol withdrawal symptoms; diazepam 20mg 6 hourly over a period of 5-7 days may be given. Disulfiram can be given as an adjunct to other treatments. High-dose of vitamin B<sub>1</sub> (Thiamine) should be given during withdrawal syndrome. Multivitamins may be given *intravenously* 8 hourly for 2 days followed by *intramuscular* injection for the following 7 days.

**Opioid dependence:** **Methadone**, an opioid agonist can prevent the onset of withdrawal syndrome due to opioids. It should only be prescribed for those who are physically dependent on opioids; **buprenorphine** can also be given. Before starting buprenorphine, the action of opioids is to be blocked; it may be given to former addicts to prevent relapse of withdrawal syndrome.

Nicotine replacement therapy and bupropion are effective aids

**Cigarette smoking cessation:** Nicotine replacement therapy and bupropion are effective aids to smoking cessation for those smoking more than 10 cigarettes a day. Bupropion has been used as an antidepressant but its mode of action in smoking cessation is not clear and may involve an effect on noradrenaline and dopamine neurotransmission. Nicotine

## 7. CENTRAL NERVOUS SYSTEM

replacement therapy is regarded as the pharmacological treatment of choice in the management of smoking cessation.

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### BUPROPION

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**Indication:** adjunct to smoking cessation in combination with motivational support

**Cautions:** elderly, hepatic impairment, measure blood pressure before and during treatment

**Contraindications:** history of seizures, of eating disorders and of bipolar disorder; pregnancy and breast feeding

**Interactions:** see *Appendix-2*

**Side-effects:** insomnia, tremor, dizziness, depression, hallucinations, memory impairment, paraesthesia, incoordination, Stevens Johnson Syndrome

**Dose:** initially 1-2 weeks before target stop date, initially 150 mg daily for 6 days then 150 mg twice daily(max. single dose 150 mg, max. daily dose 300mg; minimum 8 hours between doses.

#### **Proprietary Preparations**

**Depnox SR** (*Jayson*), SR Tab. 150 mg, Tk.10.03/Tab,

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### 7.5 ANALGESICS

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- 7.5.1 OPIOIDS
- 7.5.2 NON-OPIOIDS
  - 7.5.2.1 PARACETAMOL
  - 7.5.2.2 ASPIRIN (ACETYLSALI-CYLIC ACID)
  - 7.5.2.3 OTHER NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS)
- 7.5.3 DRUGS USED IN NEURALGIC/NEUROPATHIC PAIN
- 7.5.4 DRUGS USED IN MIGRAINE
  - 7.5.4.1 ACUTE MIGRAINE ATTACK
  - 7.5.4.2 PROPHYLAXIS OF MIGRAINE

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#### 7.5.1 OPIOIDS

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(see also section 8.1.4.1)

Opioid analgesics have the disadvantage of being severely addictive when

used repeatedly but they are very effective in relieving moderate to severe pain particularly of visceral origin.

**Morphine** is the most valuable narcotic analgesic for severe pain, although it frequently causes nausea and vomiting. It is the standard against which other opioid analgesics are compared, and is mostly used in the treatment of severe pain in the terminal conditions. **Pethidine** is probably the most frequently used narcotic analgesic. It produces prompt but short-lasting analgesia; it is less constipating, less nauseating and causes less respiratory depression than morphine, but even in high doses is a less potent analgesic. It is mostly used during labour and in postoperative painful conditions.

**Codeine** is effective for the relief of mild to moderate pain but is used mainly for its cough suppressant property (see section 4.6.1).

**Tramadol** is a relatively newer opioid derivative, which has fewer of the typical side-effects than other opioids (notable, less respiratory depression, constipation and addiction).

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### MORPHINE SULPHATE <sup>[ED]</sup>[CD]

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**Indications:** postoperative painful condition; pain in labour, myocardial infarction, acute pulmonary oedema, and other acute pain of visceral origin resistant to non-narcotic analgesics; chronic pain in terminal illness

**Cautions:** hypotension, hypothyroidism, asthma and decreased respiratory reserve, prostatic hypertrophy, pregnancy and breast-feeding; hepatic and renal impairment; elderly, epilepsy

**Contraindications:** acute respiratory depression, acute abdomen, raised intracranial pressure or head injury, phaeochromocytoma

**Interactions:** see *Appendix-2*

**Side-effects:** nausea and vomiting, constipation, drowsiness, respiratory depression, hypotension, dry mouth, sweating, headache, facial flushing, vertigo, bradycardia, tachycardia, palpitations

## 7. CENTRAL NERVOUS SYSTEM

ation, postural hypotension, hypothermia, hallucination, dysphoria, mood changes, miosis, ureteric or biliary spasm; severe dependence and tolerance

**Dose** : acute pain, *by subcutaneous or intravenous injection*, 10 mg every 2-4 hours according to the need. Myocardial infarction and pulmonary oedema, *by slow intravenous injection* (2 mg/minute) 10 mg followed by a further 5-10 mg if necessary

### Proprietary Preparations

**G-Morphine** (*Gonoshasthaya*), Inj. , Tk. 40.00/amp; SR Tab. , Tk. 10.00/Tab.

**Morphine-R** (*Renata*), Inj., Tk. 22.31/amp.

**Morphinex** (*Popular*), Inj., Tk. 20.31/amp

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### OXYMORPHINE

**Indications**: for the relief of moderate to severe pain and also as a preoperative medication to alleviate apprehension, maintain anaesthesia and as an obstetric analgesic. It can be used for the alleviation of pain in patients with dyspnoea associated with acute left ventricular failure and pulmonary oedema

**Cautions**: reduce the dose gradually; sudden withdrawal may cause withdrawal reactions

**Contraindications**: similar to other opioids

**Side effects**: similar to other opioids with constipation, nausea, vomiting, dizziness, dry mouth and drowsiness. Over dosage is characterized by respiratory depression, extreme somnolence progressing to stupor or coma, skeletal muscle flaccidity, cold and clammy skin

**Note** . Extended-release tablets are indicated for the management of chronic pain and are indicated only for patients already on a regular schedule of strong opioids for a prolonged period. This medication may rarely cause addiction and devoid of antitussive effect.

### Proprietary Preparation

**O-morphon** (*Ziska*), Inj., 1mg/ml, Tk. 50.00/1ml Amp.; Tab., 10mg, Tk. 15.00/Tab.

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### PETHIDINE HYDROCHLORIDE [ED] [CD]

**Indications**: moderate to severe pain, labour pain, peri-operative pain

**Cautions, Contraindications & Side-effects**: *see under Morphine*; avoid in severe renal impairment; convulsions may occur with over dosage

**Interactions**: *see Appendix-2*

**Dose**: 50-150 mg every 4 hours according to requirement

### Proprietary Preparations

**G-Pethidine** (*Gonoshasthaya*), Inj., 100 mg/2 ml, Tk. 24.96/Amp.

**Pethidine-R** (*Renata*), Inj., 100 mg/2 ml, Tk. 19.88/Amp.

**P-Pethidine** (*Popular*), Inj. , 100 mg/2 ml, Tk.19.89/Amp.

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### TAPENTADOL

**Indications**: pain due to injury or following surgery, peripheral neuropathy in diabetic patients

**Cautions**: operating heavy machinery and any vehicle

**Contraindications**: severe bronchial asthma, hypercapnia, and patients who have or are suspected to have paralytic ileus

**Side effects**: dizziness, constipation, sedation ,dependence

**Dose**:*consult product literature*

### Proprietary Preparations

**Cynta**(*Healthcare*), Tab., 50 mg, Tk. 14.00/Tab.; Tab., 75 mg, Tk. 20.00/Tab.

**Pentadol** (*Square*), Tab. , 100 mg, Tk. 25.00/Tab. ;50 mg, Tk. 12.00/Tab. ;Tab. , 75

mg, Tk. 17.00/Tab.

**Tapendol** (*Opsonin*), Tab., 100 mg, Tk. 16.54/Tab.; Tab., 50 mg, Tk. 9.02/Tab.; Tab., 75 mg, Tk. 12.78/Tab.

**Tapenta** (*Eskayef*), Tab.,100 mg, Tk. 20.00/Tab. ;50 mg, Tk. 12.00/Tab.; 75 mg, Tk. 17.00/Tab.

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### TRAMADOL HYDROCHLORIDE

**Indications**: moderate to severe pain

**Cautions**: *see under morphine*;

**Contraindications** : history of epilepsy; pregnancy and lactation

## 7. CENTRAL NERVOUS SYSTEM

**Interactions:** see Appendix-2

**Side effects:** hypotension, anaphylaxis, hallucinations and confusion

**Dose:** by mouth, 50-100 mg every 4 hours; total of more than 400 mg daily by mouth is not usually required. CHILD not recommended

By intramuscular or intravenous injection, 50-100 mg every 4-6 hours. CHILD not recommended

Postoperative pain 100 mg initially then 50 mg every 15-20 minutes, max. 250 mg in the first hour including initial dose; then 50-100 mg every 4-6 hours to a max. 600 mg daily. CHILD not recommended

### Proprietary Preparations

**Anadol** (Square), SR Cap., 100 mg, Tk. 12.05/Cap.; 50 mg, Tk. 8.04/Cap.; Inj., 100 mg/2 ml, Tk. 20.07/Amp.; Supp., 100 mg, Tk. 15.05/Supp.

**Dolan** (Techno), Inj., 100 mg/2 ml, Tk. 18.00/Amp.

**Dolonil** (Acme), SR Tab., 100 mg, Tk. 25.00/Amp.; Inj., 100 mg/2 ml, Tk. 20.07/Amp.; Cap., 50 mg, Tk. 7.53/Cap.

**Doloran PRT** (Novartis), Tab., 100 mg, Tk. 15.00/Tab.

**Doloran** (Novartis), Inj., 100 mg/2 ml, Tk. 40.00/Amp.; Supp., 100 mg, Tk. 20.00/Supp.; Cap., 50 mg, Tk. 8.50/Cap.

**Dolorex** (Biopharma), Cap., 100 mg, Tk. 13.05/Cap.; 50 mg, Tk. 7.53/Cap.; Inj., 100 mg/2 ml, Tk. 20.08/Amp.

**Dolotram** (Sun), Cap., 50 mg, Tk. 6.55/Cap.

**Fudol** (Pharmasia), Cap., 50 mg, Tk. 8.00/Cap.

**Imadol** (Delta), Cap., 50 mg, Tk. 7.50/Cap.

**Kadol** (Kemiko), Cap., 50 mg, Tk. 8.00/Cap.

**Leotram** (Leon), Cap., 50 mg, Tk. 8.00/Cap.

**Lucidol** (Beximco), Supp., 100 mg, Tk. 15.00/Supp.; Cap., 50 mg, Tk. 7.50/Cap.

**Pendol** (Alco), Cap., 50 mg, Tk. 6.00/Cap.

**Rapidol** (Renata), Inj., 100 mg/2 ml, Tk. 25.10/Amp.; Cap., 50 mg, Tk. 7.02/Cap.

**Reladol** (Globe), Inj., 100 mg/2 ml, Tk. 20/2 ml Amp.

**Retram** (Rephco), Inj., 100 mg/2 ml, Tk. 25.00/Amp.; 100 mg/2 ml, Tk. 30.00/Amp.; Cap., 50 mg, Tk. 8.00/Cap.

**Syndol** (Healthcare), Inj., 100mg/2ml, Tk. 25.00/Amp.; Cap., 50 mg, Tk. 8.50/Cap.

**Tendia** (ACI), Cap., 50 mg, Tk. 7.53/Cap.; ER Cap., 100 mg, Tk. 14.05/Cap. Inj., 100 mg/2 ml, Tk. 20.07/Amp.

**Tramadol** (Amico), Cap., 50 mg, Tk. 6/Cap.

**Tramanil** (Ziska), Inj., 100 mg/2 ml, Tk. 20/2 ml Amp.

**Tramapan** (Popular), Inj., 100 mg/2 ml, Tk. 20.08/Amp.

**Tranal** (Opsonin), Supp., 100 mg, Tk. 11.32/Supp.; 100 mg/2 ml, Tk. 15.10/Amp.; Cap., 50 mg, Tk. 5.66/Cap.

**TRD-Contin** (Mundipharma), CR Tab., 100 mg, Tk. 30.00/Tab.

**Trumen** (General), Inj., 100 mg/2 ml, Tk. 22.00/Inj.; Cap., 50 mg, Tk. 7.53/Cap.

**Ultradol** (Ad-din), Cap., 50 mg, Tk. 7.50/Cap.

**Ultramal** (Unimed), E.R Tab., 100 mg, Tk. 20.00/Tab.; Supp., 100 mg, Tk. 25.00/Supp.; Inj., 100 mg/2 ml, Tk. 25.00/Amp.; Cap., 50 mg, Tk. 8.50/Cap. E.R Tab., 50 mg, Tk. 10.00/Tab.

**Winpain** (Incepta), ER Cap., 100 mg, Tk. 14.00/Cap.; Cap., 50 mg, Tk. 7.50/Cap. Inj., 100 mg/2 ml, Tk. 15.00/Amp.; 100 mg/2 ml, Tk. 20.00/Amp.;

**Xtrapel** (Beacon), Cap., 100 mg, Tk. 12/Cap.; Cap., 50 mg, Tk. 8/Cap.; Inj., 100 mg/2 ml, Tk. 20/Amp.

### 7.5.2 NON-OPIOID ANALGESICS

**Paracetamol** and **aspirin** and other non-steroidal anti-inflammatory drugs or NSAIDs (see sec. 9.1.1) are useful for relief of pain of musculo-skeletal origin. Narcotic analgesics are particularly required for moderate to severe pain of visceral origin especially where non-narcotic analgesics fail to provide adequate relief.

**Aspirin** is indicated for headache, transient musculo-skeletal pain, dysmenorrhoea and pyrexia. Because of its irritant action on the stomach and the GI tract, most physicians now prefer paracetamol or an NSAID as a pain killer instead of aspirin. Aspirin is now used increasingly for its antiplatelet properties (see section 3.9)

**Paracetamol** is similar in efficacy to aspirin, but has no anti-inflammatory activity; is less irritant to the stomach and for that reason is generally preferred to aspirin. Over dosage with paracetamol is particularly dangerous because it can damage the liver.

**Non-steroid anti-inflammatory analgesic drugs** (NSAIDs, see section 9.1.1) are useful for the treatment of patients with chronic pains. Some of

## 7. CENTRAL NERVOUS SYSTEM

them are also useful for short-term treatment of acute mild to moderate pains. They are also useful for the relief of pain in dysmenorrhoea or in secondary bone tumors.

### 7.5.2.1 PARACETAMOL<sup>[ED]</sup>

**Paracetamol** (Acetaminophen) is a suitable analgesic without any significant anti-inflammatory effect and is indicated in mild to moderate headache and musculo-skeletal pains (e.g. neckache and low back pain). Unlike aspirin and other NSAIDs, it has almost no stomach side-effects and is generally well tolerated

**Indications:** mild to moderate pain e.g. muscle pain, tension headache, neckache, lumbago; pyrexia

**Cautions & Contraindications:** hepatic and renal impairment

**Interactions:** see Appendix-2

**Side-effects:** blood disorders, mild gastrointestinal upset; liver damage following overdose and misuse; less frequently renal damage may also occur. OVERDOSAGE with paracetamol is particularly dangerous as it may cause hepatic damage (see Appendix-7 for treatment of overdose and poisoning)

**Dose:** by mouth, 0.5-1 g every 6 hours to a max. dose of 4 g daily; CHILD under 3 months 10 mg/kg (5mg/kg if jaundiced); 3 months to 1 year 60-120 mg, 1 to 5 years 120-250 mg, 6 to 12 years 250-500 mg. Dose may be repeated 4 to 6 hourly

By rectum as suppositories, ADULT and CHILD over 12 years 0.5 to 1 g up to 4 times daily; CHILD 1 to 5 years 125 to 250 mg, 6 years to 12 years 250-500 mg up to 4 times daily.

#### Proprietary Preparations

**Ace** (*Square*), Tab., 500 mg, Tk. 0.80/Tab.; XR Tab., 665 mg, Tk. 1.50/Tab.; Paed. drops, 80 mg/ml, Tk.12.31/15 ml; Tk.20.64/30 ml; Susp., 120 mg/5 ml, Tk. 20.64/60 ml; Syrup, 120 mg/5 ml, Tk. 20.64/60 ml; Tk. 31.78/100 ml; Supp., 60 mg, Tk. 3.51/Supp.; 125 mg, Tk. 4.01/Supp.; 250 mg, Tk. 5.01/Supp.; 500 mg, Tk. 8.04/Supp.

**Aceta** (*Biopharma*), Tab., 500 mg, Tk. 0.80/Tab.; Paed. drops, 80 mg/ml, Tk.12.30/15 ml; Susp., 120 mg/5 ml, Tk. 20.63/60 ml  
**Act** (*Ambee*), Tab., 500 mg, Tk. 0.8 / Tab.; Paed. Drops, 80mg/ml Tk. 12.31/15ml; Suspn. 120mg/ml, Tk.16.34/ 60ml  
**Actol** (*Somatec*), Susp., 120 mg/5 ml, Tk. 20.63/60 ml  
**Anamol** (*Maks*), Tab., 500 mg, Tk. 0.80/Tab.; Susp.,120mg/5 ml, Tk.20.50/60ml  
**Asmol** (*Sharif*), Tab., 500 mg, Tk. 0.80/Tab.; Susp., 120 mg/5 ml, Tk. 20.64/60 ml  
**Asta** (*Rephco*), Susp., 120 mg/5 ml, Tk. 18.00/60 ml  
**Atopen** (*Kemiko*), Tab., 500 mg, Tk. 0.80/Tab.; Susp., 120 mg/5 ml, Tk. 20.63/60 ml; Tk. 24.62/100 ml  
**ATP** (*General*), Tab., 500 mg, Tk. 0.80/Tab.; Susp., 120 mg/5 ml, Tk. 20.63/60 ml  
**Benalgin** (*Benham*), Susp., 120 mg/5 ml, Tk. 21.00/60 ml  
**Centamol** (*Central*), Tab., 500 mg, Tk.0.80/Tab.;Susp.,120 mg/5 ml,Tk.16/60 ml  
**Cetal** (*Supreme*), Tab., 500 mg, Tk. 0.80/Tab.; Susp.,120 mg/5ml, Tk.20.63/60ml  
**Cetam** (*Pacific*), Tab., 500 mg, Tk. 0.45/Tab.; Susp., 120 mg/5 ml, Tk. 15.04/60ml  
**FAP** (*Beacon*), Tab., 500 mg, Tk. 0.65/Tab.  
**Fast** (*Acme*), Tab., 500mg, Tk. 0.8/Tab.; XR Tab., 665mg, Tk. 1.5/Tab.; Supp., 125 mg, Tk. 4.01/Supp.; 250mg, Tk.5.01/Supp.; 500mg, Tk.8.04/Supp.; Paed. drop, 80 mg/ml, Tk.14.77/15 ml; Susp., 120 mg/5 ml, Tk. 20.63/60 ml;  
**Fea** (*Navana*), Tab., 500 mg, Tk. 0.80/Tab.; XR Tab., 665 mg, Tk. 1.50/Tab.; Syrup, 120 mg/5 ml, Tk. 20/60 ml  
**Feva** (*Ad-din*), Supp.125 mg, Tk. 4.00/Supp.; 250 mg, Tk. 5.00/Supp.; 500 mg, Tk. 8.00/Supp.; Tab., 500mg, Tk. 0.75/Tab.; Paed. drops, 80 mg/ml, Tk. 12.27/100 ml; Suspn., 120mg/5ml, Tk. 18.00/60 ml  
**Fevac** (*Orion*), Susp., 120 mg/5 ml, Tk. 20.00/60 ml  
**Feverol** (*Bios*), Tab., 500 mg, Tk. 0.65/Tab.; Susp., 120 mg/5 ml, Tk. 12.75/60 ml  
**Fibi** (*MST*), Tab., 500 mg, TK. 0.80/Tab.;  
**Gesic** (*Popular*), Tab., 500 mg, Tk.0.80/Tab.; Paed. drop, 80 mg/ml, Tk.10.92/15 ml, Susp., 120 mg/5 ml, Tk. 14.65/50 ml, Tk. 16.38/60ml  
**G-Paracetamol** (*Gonosasthaya*), Tab., 500 mg, Tk. 0.60/Tab.; Susp., 120 mg/5 ml, Tk.16.00/60ml; Syrup, 120 mg/5 ml, Tk. 15.00/50 ml; Tk. 27.00/100 ml  
**Hepa** (*Hudson*), Suspn., 120mg/5ml, Tk.19.00/60 ml; Tab., 500mg, Tk.0.80  
**Longpara** (*Ibn Sina*), Tab., 665 mg, Tk. 1.51/Tab.  
**Napa** (*Beximco*), Tab., 500mg, Tk. 0.80/Tab. ER Tab., 665 mg, Tk. 1.50/Tab.; Supp., 60 mg, Tk.3.50/Supp.; 125 mg, Tk.4.00/Supp.; 250 mg, Tk.5.00/Supp.; 500 mg, Tk.8.00/Supp.;

## 7. CENTRAL NERVOUS SYSTEM

- Paed. drops, 80 mg/ml, Tk.12.30/15 ml;  
Susp., 120 mg/5 ml, Tk. 18.23/50 ml; Tk.  
21.20/60 ml; Syrup, 120mg/5 ml, Tk. 18.23/50  
ml; Tk. 20.60/60ml; Tk. 31.77/100ml; IV  
Infusion, 1 gm/100 ml, Tk.120.00/100ml
- Para** (*Amico*), Tab., 500 mg, Tk. 0.80/Tab. ;  
Paed. drop, 80 mg/ml, Tk.12.00/15 ml;  
Susp., 120 mg/5 ml, Tk. 20.00/60 ml
- Paracetamol** (*Albion*), Tab., 500 mg, Tk.  
0.65/Tab.; ER Tab., 665mg, Tk.1.50/Tab. ;  
Susp., 120 mg/5 ml, Tk. 11.30/50ml
- Paracetamol** (*Ziska*), Tab., 500mg, Tk.  
0.57/Tab.; Susp., 120mg/5ml, Tk. 16.28/60ml
- Paraciv** (*Beacon*), Inj.,(IV Infusion), 1 gm/100  
ml, Tk.120.00/100ml
- Parapyrol** (*GSK*), Tab., 500 mg, Tk.  
0.64/Tab.; Susp., 120 mg/5 ml, Tk.  
26.40/100ml
- Paraxia** (*Pharmasia*), Tab., 500 mg, Tk.  
0.80/Tab.; Susp.,120 mg/5 ml, Tk. 20.50/60 ml
- Pol** (*Globe*), Tab., 500 mg, Tk. 0.80/Tab. ;  
Susp., 120 mg /5 ml, Tk. 20.56/60 ml
- Pyrac** (*Medimet*), Susp., 2.4mg/5ml,  
Tk.20.00/60ml; Syrup, 125mg/5ml,  
Tk.18.25/50ml; Tab., 500mg, Tk.0.80/Tab.
- Pyralgin** (*Renata*), Tab., 500 mg, Tk.  
0.80/Tab.; Susp., 120mg/5ml, Tk.20.64/60ml
- Renova** (*Opsonin*), Tab., 500 mg, Tk.  
0.60/Tab.; XR Tab., 665 mg , Tk. 1.13/Tab. ;  
Supp., 60 mg, Tk. 2.64/Supp.; 125 mg,  
Tk.3.02/Supp.; 250 mg, Tk. 3.77/Supp.; 500  
mg, Tk. 6.04/Supp.; Inj.,(IV Infusion), 1 gm/100  
ml, Tk.90.23/100 ml; Paed. drop, 80 mg/ml,  
Tk. 9.26/15 ml; Susp., 120 mg/5 ml, Tk. 15.5  
2/60 ml; Tk. 18.44/100 ml; Syrup, 120mg/5ml,  
Tk.15.52/60ml; Tk.23.76/100ml
- Reset** (*Incepta*), Tab., 500 mg, Tk.0.80/Tab. ;  
IV Infusion, 1 gm/100 ml, Tk.120.00/100 ml;  
Paed. drops, 80 mg/ml, Tk.12.30/15 ml; Syrup,  
120 mg/5 ml, Tk. 20.64/60 ml
- Seridol** (*Sonear*), Tab., 500 mg, Tk. 0.80/Tab.
- Servigesic** (*Novartis*), Tab., 500 mg,  
Tk.0.80/Tab.
- Sinapol** (*Ibn Sina*), Susp., 120 mg/5 ml, Tk.  
20.00/60 ml; Tab., 500 mg, Tk. 0.80/Tab.
- Tamen** (*Eskayef*), Tab., 500 mg, Tk.  
0.80/Tab.; IV Infusion, 1 gm/100 ml,  
Tk.120.00/100 ml; Syrup, 120 mg/5 ml, Tk.  
20.56/60 ml; Tk. 31.66/100 ml; Paed. drops,  
80 mg/ml, Tk.12.26/15 ml
- Tamino** (*Nipro JMI*), Tab., 500 mg, Tk.  
0.80/Tab.; XR Tab., 665 mg, Tk. 1.50/Tab.,  
Susp., 120 mg/5 ml, Tk. 20.63/60 ml
- Tamol** (*Apex*), Tab., 500 mg, Tk. 0.80/Tab. ;  
Susp., 120 mg/5 ml, Tk. 16.34/60 ml
- Tempil** (*Alco*), Tab., 500 mg, Tk. 0.80/Tab. ;  
Susp., 120 mg/5 ml, Tk. 24.53/100 ml
- Tempol** (*Asiatic*), Tab., 500mg, Tk. 0.80/Tab. ;  
Paed. drop, 80 mg/ml, Tk.12.31/15 ml; Tk.  
15.73/30 ml; Susp., 120 mg/5 ml, Tk.16.34/60 ml
- Tylen** (*RAK*), Tab., 500 mg, Tk. 0.80/Tab. ;  
Susp., 120 mg/5 ml, Tk. 20.60/60 ml
- Xcel** (*ACI*), Tab., 500 mg , Tk. 0.80/Tab.; XR  
Tab., 665 mg , Tk. 1.50/Tab. Paed. drop, 80  
mg/ml , Tk.12.31/15 ml; Susp., 120 mg/5 ml,  
Tk. 20.63/60 ml; Syrup, 120 mg/5 ml, Tk.  
20.64/60 ml
- Xpa** (*Aristo*), Tab., 500 mg, Tk. 0.80/Tab.; XR  
Tab., 665 mg, Tk. 1.50/Tab.; Supp., 125 mg,  
Tk.5.00/Supp.; 250 mg, Tk.6.00/Supp.; 500  
mg, Tk.9.00/Supp.; Paed. drops, 80 mg/ml,  
Tk.12.30/15 ml; Susp., 120mg/5 ml, Tk.  
20.60/60 ml; Tk. 24.60/100 ml
- Zerin** (*Jayson*), Tab., 500 mg, Tk. 0.80/Tab. ;  
Susp., 120 mg/5 ml, Tk. 20.00/60 ml; Paed.  
drops, 80 mg/ml , Tk.12.30/15 ml
- Paracetamol 500 mg + Caffeine 65 mg
- Ace Plus** (*Square*), Tab., Tk. 2.50/Tab.
- Aceta-X** (*Biopharma*), Tab., Tk. 1.91/Tab.
- Act plus** (*Ambee*), Tab., Tk. 1.51/Tab
- Anamol Plus** (*Maks*), Tab., Tk. 1.50/Tab.
- Asmol Plus** (*Sharif*), Tab., Tk. 1.50/Tab.
- ASTA Plus** (*Rephco*), Tab., Tk. 2.00/Tab.
- Atopen Plus** (*Kemiko*), Tab., Tk. 2.50/Tab.
- Benalgin Plus** (*Benham*), Tab., Tk. 1.90 /Tab.
- Caface** (*Leon*), Tab., Tk. 2.00/Tab.
- Cafecool Plus** (*Doctor TIMS*), Tab., Tk.  
2.50/Tab.
- Cafedon** (*Healthcare*), Tab., Tk. 2.50/Tab.
- Cafenol** (*General*), Tab., Tk. 1.91/Tab.
- Caffo** (*Somatec*), Tab., Tk. 1.90/Tab.
- Caf-N** (*Globex*), Tab., Tk. 2.00/Tab.
- Centamol Plus** (*Central*), Tab., Tk. 1.90/Tab.
- Cetam Plus** (*Pacific*), Tab., Tk. 1.77/Tab.
- Clofamol** (*Ziska*), Tab., Tk. 1.5/Tab.
- Fap-Plus** (*Beacon*), Tab., Tk. 1.50/Tab.
- Fast Plus** (*Acme*), Tab. Tk. 1.90/Tab.
- Fea Plus** (*Navana*), Tab., Tk. 2.5/Tab.
- Feva plus** (*Ad-din*), Tab., Tk. 1.50/Tab.
- Fibi-plus** (*MST*), Tab., Tk. 2/Tab.
- Gesic Plus** (*Popular*), Tab., Tk. 1.51/Tab.
- Hedex** (*Orion*), Tab., Tk. 1.51/Tab.
- Hepa-plus** (*Hudson*), Tab., Tk.2.00/Tab.
- Napa Extra** (*Beximco*), Tab. Tk. 2.50/Tab.
- P+C** (*Alco*), Tab., Tk. 1.90/Tab.
- Pac** (*Ibn Sina*), Tab., Tk. 2.00/Tab.
- Pamix-M** (*Ziska*), Tab., Tk. 2.50/Tab.
- Panadol Extra** (*G.S.K.*), Tab., Tk. 1.67 /Tab.
- Para Fast** (*APC*), Tab., Tk. 1.50/Tab.
- Para-C** (*Amico*), Tab., Tk. 1.90/Tab.
- Paracet Plus** (*White Horse*), Tab., Tk.  
1.50/Tab.
- ParacetamolExtra**(*Albion*),Tab.,Tk.1.50/Tab
- Paraxia Plus** (*Pharmasia*), Tab. Tk. 1.90/Tab.
- Pol plus** (*Globe*), Tab., Tk. 1.50/Tab.
- Pyra Plus** (*Renata*), Tab., Tk. 2.00/Tab.
- Pyrenol** (*Delta*), Tab., Tk.1.90/Tab.
- Pyrex Plus** (*Concord*), Tab., Tk. 1.80/Tab.
- Pyrexil Plus** (*Veritas*), Tab., Tk. 2.50/Tab.
- Reliv Plus** (*Astra*), Tab., Tk. 1.90/Tab.
- Renova Plus** (*Opsonin*), Tab., Tk. 1.88/Tab.
- Reset Plus** (*Incepta*), Tab. Tk. 1.90/Tab.
- Tacs** (*Rangs*), Tab., Tk. 1.90/Tab.



## 7. CENTRAL NERVOUS SYSTEM

**Tamen X** (*Eskayef*), Tab., Tk. 1.90/Tab.  
**Tamino Plus** (*Nipro JMI*), Tab. Tk. 1.50/Tab.  
**Tamol Plus** (*Apex*), Tab. Tk. 1.50/Tab.  
**Temfin** (*Organic*), Tab. Tk. 1.80/Tab.  
**Tempol Plus** (*Asiatic*), Tab. Tk. 1.90/Tab.  
**Tylen plus** (*RAK*), Tab. Tk. 2.50/Tab.  
**Xcel Plus** (*ACI*), Tab., Tk. 1.91/Tab.  
**Xpa-C** (*Aristo*), Tab., Tk. 2.00/Tab.  
**Zerin-XP** (*Jayson*), Tab., Tk. 1.90/Tab.

### Paracetamol 500 mg + DL-Methionine 100 mg

**Actol M** (*Somatec*), Tab., Tk. 2.50/Tab.  
**Fast-M** (*Acme*), Tab., Tk. 2.50/Tab.  
**Metace** (*Leon*), Tab., Tk. 2.50/Tab.  
**Napa Soft** (*Beximco*), Tab., Tk. 2.50/Tab.  
**Paradote** (*Renata*), Tab., Tk. 2.50/Tab.  
**Paramin** (*Sharif*), Tab., Tk. 2.50/Tab.  
**Renomet** (*Opsonin*), Tab., Tk. 1.88/Tab.  
**Tamepro** (*Eskayef*), Tab., Tk. 2.50/Tab.  
**Xiacet** (*Opso Saline*), Tab., Tk. 1.88/Tab.

### Paracetamol 500 mg + Tramadol 37.50 mg.

**Acetram** (*Square*), Tab., Tk. 8.00/Tab.  
**Alkafen** (*Navana*), Tab., Tk. 8.00/Tab.  
**Atopen-X** (*Kemiko*), Tab., Tk. 8.00/Tab.  
**Fastdol** (*Acme*), Tab., Tk. 8.00/Tab.  
**NapaDol** (*Beximco*), Tab., Tk. 8.00/Tab.  
**Novodol** (*Orion*), Tab., Tk. 8.00/Tab.  
**P-Dol** (*Popular*), Tab., Tk. 5.00/Tab.  
**Pyredol** (*Delta*), Tab., Tk. 8.00/Tab.  
**Pyrex T** (*Concord*), Tab., Tk. 8.00/Tab.  
**Resadol** (*Incepta*), Tab., Tk. 8.00/Tab.  
**Syndol Plus** (*Healthcare*), Tab., Tk. 8/Tab.  
**Tamenol** (*Eskayef*), Tab., Tk. 8.00/Tab.  
**Tracet** (*Opsonin*), Tab., Tk. 6.02/Tab.  
**Tramatol** (*Somatec*), Tab., Tk. 8.00/Tab.  
**Tramp** (*General*), Tab., Tk. 6.00/Tab.  
**TRD-P** (*Mundipharma*), Tab., Tk. 8.00/Tab.  
**Trugesic** (*Doctor TIMS*), Tab., Tk. 8.00/Tab.  
**Utracet** (*Unimed*), Tab., Tk. 8.00/Tab.  
**Xcel Max** (*ACI*), Tab., Tk. 8.00/Tab.

### 7.5.2.2 ASPIRIN (ACETYLSALICYLIC ACID)<sup>[E<sup>D</sup>]</sup>

**Aspirin** has the similar analgesic and antipyretic properties as those of paracetamol and may be used in similar conditions. Because of its potent anti-inflammatory effect, it may also be used in many inflammatory diseases e.g. rheumatic fever, though other NSAIDs are increasingly preferred to aspirin in these conditions. Aspirin causes significant gastric irritation. Its use (in low dose) is now more and more restricted to its antiplatelet action (see section 3.9). Dispersible aspirin tablets are adequate for most purposes as they

act rapidly and are less irritant for the stomach.

**Indications:** mild to moderate pain, pyrexia, inflammatory condition; used as an antiplatelet drug

**Cautions:** asthma, peptic ulcer, gastric hyperacidity, renal and hepatic impairment, allergic conditions and pregnancy

**Contraindications:** children under 12 years and breast-feeding mothers are not to be given aspirin because it may cause Reye's syndrome; active peptic ulcer, haemophilia, known hypersensitivity to NSAIDs

**Interactions:** see Appendix-2

**Side-effects:** gastric irritation, nausea, vomiting, heartburn, epigastric burning, gastro-intestinal bleeding, bronchospasm and precipitation of bronchial asthma, hypersensitivity

**Dose:** 300-900 mg every 4-6 hours when necessary; max. 4 g daily; CHILD not recommended

For antiplatelet activity, see section. 3.9

### Proprietary Preparations

**Aciprin CV** (*ACI*), Tab. 75mg, Tk.0.38/Tab.  
**Asorin** (*Kemiko*), Tab. 75 mg, Tk.0.50/Tab.  
**Aspirin** (*Albion*), Tab. 300 mg, Tk.1.07/Tab.; 75 mg, Tk.0.50/Tab.  
**Caid** (*Jayson*), Tab. 75 mg, Tk.0.50/Tab.  
**Carva** (*Square*), Tab. 75 mg, Tk.0.57/Tab.  
**Disprin CV** (*Reckitt*), 100mg, Tk.0.8/Tab.; 300 mg, Tk.1.66/Tab.  
**Ecosprin** (*Acme*), Tab. 150 mg, Tk.0.8/Tab.; 300 mg, Tk. 1.72/Tab.; 75 mg, Tk.0.58/Tab.  
**Encoprin I.D.** (*Medimet*), Tab., 75mg, Tk.0.50/Tab  
**Erasprin** (*Unimed*), Tab. 75 mg, Tk.0.57/Tab.  
**G-Aspirin** (*Gonosshasthaya*), Tab. 300 mg, Tk. 0.20/Tab.; 100 mg, Tk. 0.30/Tab.  
**Mysprin** (*Pacific*), Tab. 75 mg, Tk.0.38/Tab.;  
**Solrin** (*Opsonin*), Tab. 300 mg, Tk.0.34/Tab.; 75 mg, Tk.0.38/Tab.

### 7.5.2.3 OTHER NON-STEROIDAL ANTI-INFLAMMATORY DRUGS (NSAIDS)

(see also section 9.1.1)

**NSAIDs** other than aspirin are paracetamol are frequently used for acute and chronic painful conditions particularly when associated with

inflammation. They are effective for moderate to severe musculo-skeletal pain. Their use is sometimes limited due to their acute gastric side effects and long term renal complications.

Those NSAIDs which have prominent analgesic activity are: **Ibuprofen**, **Naproxen**, **Ketorolac** and **Refocoxib**. Fodetail description of these drugs

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### 7.5.3 DRUGS USED IN NEURALGIC/NEUROPATHIC PAIN

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Neuralgic pain responds poorly to conventional non-opioid or opioid analgesics. They can sometimes be distressing and difficult to control with drugs and may require special measures like transcutaneous electrical nerve stimulation (TENS), nerve blocks or surgery. The neuralgic/neuropathic pain includes trigeminal neuralgia, brachial neuralgia (and other radicular pain), post-herpetic neuralgia, diabetic amyotrophy, atypical facial pain, pains from entrapment neuropathies, thalamic pain and phantom limb syndrome.

**Carbamazepine** is a frequently used drug for neurogenic pain. It is particularly effective in the treatment of trigeminal neuralgia, thalamic pain and sometimes in radicular pains. It is always started with a low dose and gradually increased to the required dose to prevent initial gastrointestinal and CNS side-effects. Patients should be counselled about the possible hypersensitivity reaction that may occur usually within 7 days and may be fatal (causing Stevens Johnson syndrome) if not stopped immediately.

**Amitriptyline** is also a frequently used drug in this category. It has less short and long term side-effects than carbamazepine but sometimes requires very high dose to be effective. It can sometimes be distressingly sedating and is particularly effective in post-herpetic neuralgia and often prescribed in other neurogenic pains along with carbamazepine.

**Phenytoin**, **gabapentin** and **sodium valproate** may also be used either alone

## 7. CENTRAL NERVOUS SYSTEM

or in combination with amitriptylin or carbamazepine.

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### AMITRIPTYLINE<sup>[ED]</sup>

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see section 7.3 on anti-depressant drug

**Dose:** *by mouth*, initially 10-25 mg daily as a single dose in the evening; increased gradually as necessary to max. 100mg/day in divided doses

**Proprietary Preparations**

see section 7.3

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### CARBAMAZEPINE<sup>[ED]</sup>

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see section 7.6.1 on anti-epileptic drugs.

**Proprietary Preparation**

see section 7.6.1

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### 7.5.4 DRUGS USED IN MIGRAINE

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#### 7.5.4.1 ACUTE MIGRAINE ATTACK

#### 7.5.4.2 PROPHYLAXIS OF MIGRAINE

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#### 7.5.4.1 ACUTE MIGRAINE ATTACK

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Treatment of acute attack of migraine is symptomatic mostly with **analgesics** and **antiemetics**, and should be initiated as soon as the headache phase starts. Patients should also be instructed to rest in a dark and quiet room during this phase. Rarely in refractory cases, specific treatment such as the use of **Ergotamine** may be required.

Most migraine headaches respond to simple analgesics such as paracetamol or aspirin (see section 7.5.2.1) but occasionally more potent NSAIDs e.g. naproxen (see section 9.1.1) and tolfenamic acid may be needed.

At the beginning of the headache phase of a migraine attack, the most frequently used anti-emetic is **Prochlorperazine** though **Metoclorpramide** is equally effective and has the added advantage of promoting gastric emptying and normal peristalsis which may be impaired in this condition. These may be used either by mouth or by intramuscular injection. **Domperidone** is a suitable alternative.

## 7. CENTRAL NERVOUS SYSTEM

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### DOMPERIDONE

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(see also section 2.2 and 7.8)

**Indications:** nausea and vomiting associated with levodopa therapy and bromocriptine, functional dyspepsia, acute migraine attack

**Cautions:** renal impairment, pregnancy and breast-feeding; not recommended for routine prophylaxis of postoperative vomiting or for chronic administration

**Interactions:** see Appendix-2

**Side-effects:** raised prolactin concentrations (possible galactorrhoea and gynaecomastia), reduced libido reported; rashes and other allergic reactions; acute dystonic reactions reported

**Dose:** 10-20 mg 3 times daily according to the requirement. CHILD: Not recommended except nausea and vomiting after cytotoxic therapy, 200-400 micrograms/kg every 4-8 hours

#### **Proprietary Preparations**

see section 2.2

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### METOCLOPRAMIDE HCl<sup>[ED]</sup>

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(see also section 2.2 and 7.8)

#### **Proprietary Preparations**

see also section 2.2

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### PROCHLORPERAZINE

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(see also section 7.2)

**Indications:** severe nausea, vomiting, vertigo irrespective of the aetiology; acute migraine attack

**Cautions and Contraindications:** see under Chlorpromazine Hydrochloride in section 7.2

**Interactions:** see Appendix-2

**Side-effects:** see under Chlorpromazine Hydrochloride (see section 7.2); extrapyramidal symptoms may occur, particularly in children, elderly and debilitated

**Dose:** by mouth, 5-10 mg 1-3 times/day according to the requirement and response. CHILD: Not recommended. By deep intramuscular injection, 12.5 mg

followed if necessary after 6 hours by oral dose, as above. CHILD: Not recommended

#### **Proprietary Preparations**

see Section 7.2.

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### TOLFENAMIC ACID

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**Indication:** acute attack of migraine

**Cautions:** history of asthma, bleeding disorders, peptic ulcer, hypertension

**Contraindications:** hepatic or renal impairment, elderly, pregnancy and breast feeding

**Side-effects:** dysuria in males, diarrhea, nausea, redness of the skin, headache, tremor, fatigue.

**Dose:** 200 mg when 1st symptoms appear, may be repeated once after 1-2 hour

#### **Proprietary Preparations**

**Arain** (Opsonin), Tab., Tk. 6.04/Tab.

**Migratol** (Beacon), Tab., 200 mg, Tk.8.03/Tab.

**Namitol** (ACI), Tab, 200 mg , Tk. 8.00/Tab.

**Tolmic** (Beximco), Tab., 200 mg, Tk. 8.03/Tab.

**Tufnil** (Eskayef), Tab, 200 mg, Tk. 10.00/Tab.

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### 5HT<sub>1</sub> AGONIST

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A 5HT<sub>1</sub> agonist may be used and is of value in the treatment of acute migraine attack and is preferred if the treatment is not responding to simple analgesic or NSAIDs. The 5HT<sub>1</sub> agonist (triptans) act on the 5HT<sub>1</sub> (serotonin) 1B/1D receptors and they are therefore sometimes referred to as 5HT<sub>1</sub> receptor agonist.

The 5HT agonist available for treating migraine are **Almotriptan, frovatriptan, naratriptan, rizatriptan, sumatriptan, and zolmitriptan**

**Cautions:** 5HT<sub>1</sub> agonist should be used with caution in conditions which predispose to coronary artery disease; hepatic impairment; pregnancy; and breast feeding. 5HT<sub>1</sub> agonist are recommended as monotherapy and should not be taken concurrently with other therapies for acute migraine. If intense chest and throat pain and

## 7. CENTRAL NERVOUS SYSTEM

tightness occur, treatment should be discontinued, may be due to coronary vasoconstriction.

**Contra-indications:** 5HT<sub>1</sub> agonist should not be used prophylactically and should not be administered to patients with basilar or hemiplegic migraine. They are contraindicated in uncontrolled or severe hypertension, ischemic heart disease, a history of myocardial infarction, coronary vasospasm (Prinzmetal angina), peripheral vascular disease.

Drowsiness may occur following treatment with 5HT<sub>1</sub> agonist so it may affect performance of skilled tasks e.g driving, operating machine etc.

**Side-effects:** Most common side effects are dizziness, flushing, weakness, drowsiness, fatigue. Nausea and vomiting may occur. Pain and sensation of tingling, heat, heaviness of any part of the body are also reported.

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### ERGOTAMINE TARTRATE

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**Indications:** treatment of acute migraine attacks and migraine variants unresponsive to analgesics

**Cautions:** risk of peripheral vasospasm; elderly, should not be used for migraine prophylaxis

**Contraindications:** peripheral vascular diseases, coronary heart disease, obliterative vascular disease and Raynaud's syndrome, hepatic and renal impairment, sepsis, severe or inadequately controlled hypertension, hyperthyroidism, pregnancy and breast-feeding

**Interactions:** see *Appendix-2*

**Side-effects:** nausea, vomiting, vertigo, abdominal pain, diarrhoea, muscle cramps, and occasionally increased headache; precordial pain, myocardial ischaemia, rarely myocardial infarction; repeated high dosage may cause ergotism with gangrene and confusion; pleural and peritoneal fibrosis

**Dose:** ergotamine tartrate 2 mg tablet sublingually at the onset repeated after 30-60 minutes if necessary to max. 3

tabs in 24 hours and 6 tablets in one week. CHILD: Not recommended

Ergotamine tartrate (1 mg) + Caffeine (100 mg) 1-2 tablets at the onset to max. 4 tabs in 24 hours; not to be repeated at intervals of less than 4 days; max. 8 tabs in one week. CHILD not recommended

Note. Ergotamine containing preparation should not be taken until 6 hours after sumatriptan.

#### **Proprietary Preparation**

Ergotamine tartrate with Caffeine

**Migrin** (*Skylab*), Tab. Tk.5/Tab

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### RIZATRIPTAN

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**Indication:** treatment of the headache phase of acute migraine attacks

**Cautions:** see *notes above* and under sumpatriptan

**Contraindications:** see *notes above* and under sumpatriptan

**Interactions:** see *Appendix-2*

**Side effects:** see *notes above* and under sumpatriptan

**Dose:** *by mouth* Initially 10mg dose may be repeated after not less than 2 hours if migraine recurs; (patient not responding should not take second dose for same attack) max. 20mg in 24 hours

#### **Proprietary Preparations**

**Rizamig** (*Healthcare*), Tab., 5 mg, Tk.

35.50/Tab.

**Rizat** (*Acme*), Tab., 5 mg, Tk. 30.11/Tab.

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### SUMATRIPTAN

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**Indications:** treatment of acute migraine attacks, cluster headache

**Cautions:** see *notes above*; renal impairment and hepatic impairment, history of epilepsy

**Contra-indications:** see *notes above*; ischaemic heart attack, moderate and severe hypertension

**Interactions:** see *Appendix-2*

**Side-effects:** see *notes above*. drowsiness, transient increase in blood pressure, hypo tension, bradycardia or

## 7. CENTRAL NERVOUS SYSTEM

tachycardia, visual disturbance, ischaemic colitis, Raynaud's syndrome altered liver function; seizures are reported; erythema at injection site

**Dose:** initially 50mg (some patient may require 100mg), as soon as possible onset (patient not responding should not take second dose for same attack); dose may be repeated after not less than 2 hours if migraine recurs; max. 300mg in 24 hours CHILD and ADOLESCENT under 18 years not recommended.

### **Proprietor Preparation**

**Nomigran** (*Ambee*), Tab., 100 mg , Tk. 90.35/Tab; 50 mg , Tk. 45.17/Tab

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### **ZOLMITRIPTAN**

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**Indications:** treatment of acute migraine attacks

**Cautions:** see notes above and under sumatriptan; should not be taken within 12 hours of any other 5HT<sub>1</sub> agonist

**Contra-indications:** see notes above and under *Sumpatriptan*; Wolf-Parkinson-White syndrome or arrhythmias associated with accessory cardiac conduction pathways; previous cerebrovascular accident or transient ischaemic attack

**Interactions:** see Appendix-2

**Side-effects:** see notes above and under *Sumpatriptan*;

**Dose:** by mouth Initially 2.5 mg .as soon as possible after onset; dose may be repeated after not less than 2 hours if migraine persists or recurs; (increase to 5mg for subsequent attacks in patients not achieving satisfactory relief with 2.5mg dose); max. 10mg in 24 hours CHILD: Not recommended

### **Proprietary Preparations**

**Miotrol** (*Drug Int*), Tab., 2.5 mg, Tk. 15/Tab.

**Nomi** (*Square*), Tab., 2.5 mg, Tk. 25.10/Tab.

**Zomitran** (*Incepta*), Tab., 2.5 mg, Tk. 25/Tab.

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### **7.5.4.2 PROPHYLAXIS OF MIGRAINE**

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Preventive treatment is not necessary for many migraine patients. Those who require it should be carefully chosen. At first an elaborate search is made to find

out relevant common migraine precipitants e.g. excess physical or mental stress, sleep or food deprivation, certain food or drink and the patient is asked to avoid these as far as practicable. If the attacks are still too frequent or severe or prolonged enough to impair one's lifestyle, it is generally advisable to start a prophylactic drug. The commonly used drugs are **Sodium valproate**,

**Propranolol** and **amitriptyline**. Other possible useful drugs are **pizotifen**, some beta-blockers (e.g. **Metoprolol**, **nadolol**, **timolol**, **atenolol**), **Tricyclic antidepressants** (**nortriptyline**, **imipramine**) and calcium channel blockers (e.g. **verapamil**, **nifedipine**).

**Sodium valproate** (see section 7.6.1) may be effective in a dose of 300-600 mg/day in 2 divided doses. It can be a very effective migraine prophylactic drug but has been associated with severe hepatic and pancreatic toxicity, although such effects are rare. It should not be prescribed in young females of childbearing age (many migraine patients are) because of its potential teratotoxicity. However, it is still possibly the best prophylactic drug for migraine in adult males.

**Propranolol** is the most commonly used beta-blocker for migraine and can be quite effective when given in a dose of 60-180 mg/day in 2-3 divided doses. The value of beta-blockers is limited by their contra-indications (see section 3.1).

**Amitriptyline** (see section 7.3) may be useful even when there is no evidence of depression. It is started with dose of 10 mg at night, increasing to a maintenance dose of 50-75 mg at night.

**Pizotifen** is an antihistamine and serotonin antagonist. It is indicated in prophylactic treatment of migraine probably after sodium valproate, propranolol and amitriptyline have failed though it is said to be very much effective in children. Occasionally its use is limited by its side-effects of excess drowsiness and weight gain.

## 7. CENTRAL NERVOUS SYSTEM

### PIZOTIFEN

**Indications:** prevention of vascular headache including migraine with or without aura and cluster headache

**Cautions:** urinary retention; closed angle glaucoma, renal impairment; pregnancy and breast-feeding

**Interactions:** see *Appendix-2*

**Side-effects:** drowsiness, increased appetite and weight gain; nausea, dizziness; hyperactivity in children

**Dose:** 1.5 mg at night or 0.5 mg 3 times daily, adjusted according to response within the usual range 0.5-3 mg daily; max. single dose 3 mg, max. daily dose 4.5 mg; CHILD up to 1.5 mg daily in divided doses; max. single dose at night 1 mg

#### **Proprietary Preparations**

**Antigrain** (*Ibn Sina*), Tab., 0.5 mg, Tk. 3.25/Tab.; 1.5 mg, Tk. 7.25/Tab.

**Avidro** (*Beximco*), Tab., 0.5 mg, Tk. 3.00/Tab.; 1.5 mg, Tk. 7.00/Tab.

**D-Fen** (*Drug Intl*), Tab., 0.5 mg, Tk. 3.00/Tab.; 1.5 mg, Tk. 5.00/Tab.

**Dmigrain** (*Nipro JMI*), Tab., 0.5 mg, Tk. 3.00/Tab.; 1.5 mg, Tk. 7.00/Tab.

**Migranil** (*Square*), Tab., 0.5 mg, Tk. 3.01/Tab.; 1.5 mg, Tk. 7.02/Tab.

**Pifen** (*Opsonin*), Tab., 0.5 mg, Tk. 2.26/Tab.; 1.5 mg, Tk. 5.29/Tab.

**Pizo-A** (*Acme*), Tab., 0.50 mg, Tk. 3.00/Tab.; 1.5 mg, Tk. 7.02/Tab.

**Pizofen** (*Navana*), Tab., 0.5 mg, Tk. 3.01/Tab.; 1.5 mg, Tk. 7.03/Tab.

**Zeromig** (*Eskayef*), Tab, 0.5 mg, Tk. 3.00/Tab.; 1.5 mg, Tk. 7.00/Tab.

**Zofen** (*Aristo*), Tab., 0.5 mg, Tk. 3.10/Tab.; 1.5 mg, Tk. 7.20/Tab.

### 7.6 ANTI-EPILEPTIC DRUGS

7.6.1 CONTROL OF EPILEPSY

7.6.2 STATUS EPILEPTICUS

#### 7.6.1 CONTROL OF EPILEPSY

Once the diagnosis of epilepsy is made, it is crucial to decide the correct choice of anticonvulsant. An ideal therapy is the one with which the occurrence of seizures is completely prevented by the use of a single antiepileptic drug in

minimum possible dose with no or least side-effects. It is important to decide the first choice of drug in the individual case depending on the type of epilepsy, age, sex and the economic status. The anticonvulsant is started as monotherapy in the lowest possible dose and then gradually increased until the seizures are completely controlled or side-effects appear. In the later situation, another anticonvulsant is added to the first one similarly in the lowest dose and then gradually increased. Combination therapy should preferably be avoided until monotherapy with several alternative drugs has proved ineffective. Combination therapy enhances toxicity; drug interactions may also occur between antiepileptics.

Once the right choice and proper dose of the anticonvulsant for the individual patient is decided, the second important point is how long it should be continued. In case of Idiopathic (primary) Generalised Epilepsy (IGE) it is usually advisable to continue therapy for at least 3 years with complete suppression of seizures before considering withdrawal. In case of Localisation Related (secondary) Epilepsy (LRE), where the underlying structural problem cannot be corrected, it may be necessary to continue therapy indefinitely. When the decision to withdraw antiepileptic therapy is made, it is important that it is done very gradually taking several weeks to months. There is significant risk of seizure recurrence on drug withdrawal even when done cautiously and patients should be warned to be careful and to avoid dangerous circumstances unsupervised during this period and 6 months thereafter.

**IDIOPATHIC GENERALISED EPILEPSY:** The drugs of choice for all types of IGEs are **sodium valproate**, **phenobarbitone**, **phenytoin** and **lamotrigine**.

**ABSENCE EPILEPSY** (Petit Mal): **ethosuximide** and **sodium valpro-ate** are the drugs of choice, and both are about equally effective.

## 7. CENTRAL NERVOUS SYSTEM

MYOCLONIC EPILEPSY: **clonazepam** is considered second best choice after **sodium valproate**.

LOCALISATION RELATED EPI-LEPSY: **Carbamazepine, sodium valproate, phenobarbitone, phenytoin** and **lamotrigine** are the drugs of choice for secondary (partial) epilepsy. Second line drugs include **clonazepam** and **clobazam**. **Gabapentine, vigabatrin** and **topiramate** are used as adjunct therapy where control is difficult to obtain.

**Levetiracetam** is also used in partial seizures, or as an adjunctive therapy for partial, myoclonic and tonic clonic seizures.

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### CARBAMAZEPINE<sup>[ED]</sup>

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**Indications:** partial and secondary generalized seizure, alcohol withdrawal seizure, prophylaxis of manic depressive illness, trigeminal neuralgia, other forms of neuralgic pains

**Cautions:** pregnancy; hepatic or renal impairment; cardiac disease; skin reactions to other drugs; breast-feeding; avoid sudden withdrawal

**Contraindications:** hypersensitivity, history of bone marrow depression, AV conduction abnormalities

**Interactions:** see *Appendix-2*

**Side-effects:** nausea, vomiting, headache, drowsiness, diplopia, ataxia, dizziness, blurred vision, dry mouth, Stevens-Johnson-Syndrome, leucopenia and other blood disorders.

Other side-effects include cholestatic jaundice, hepatitis and acute renal failure.

**Dose:** epilepsy in ELDERLY, initially 100-200 mg 2 times daily, increased slowly to usual dose of 0.8-1.2 g daily in divided doses, in some cases, 1.6-2 g daily may be needed. CHILD up to 1 year of age 100-200 mg daily in divided doses; 1-5 years, 200-400 mg; 5-10 years, 400-600 mg; 10-15 years, 0.6-1 g  
Prophylaxis of manic depressive illness (bipolar disorder) unresponsive to lithium

therapy, initially 400 mg daily in divided doses increased until symptoms controlled; usual range 400-600 mg daily max. 1.6 g daily

### Proprietary Preparations

**Anleptic** (*Square*), CR Tab., 200 mg, Tk. 4.52/Tab.; Susp, 100 mg/5 ml, Tk. 250.94/100 ml; Tab., 200 mg, Tk. 3.51/Tab.  
**Carbazin** (*Eskayef*), Tab, 200 mg, Tk. 4.00/Tab.; CR Tab, 200 mg, Tk. 4.50/Tab.  
**Carmapine** (*Incepta*), CR Tab., 200 mg, Tk. 5.00/Tab.; Tab., 200 mg, Tk. 4.00/Tab.; Susp, 100 mg/5 ml, Tk. 250.00/100 ml  
**Cazep** (*Opsonin*), Tab., 200 mg, Tk. 3.02/Tab.  
**Epilep** (*Beximco*), CR Tab., 200 mg, Tk. 2.30/Tab.; Tab., 200 mg, Tk. 3.50/Tab.  
**Tegretol** (*Novartis*), CR Tab., 200 mg, Tk. 8/Tab.; Tab., 200 mg, Tk. 8/Tab.  
**Zeptol** (*Sun*), Tab., 200 mg, Tk. 5.50/Tab.; CR Tab., 200 mg, Tk. 6.00/Tab.; CR Tab., 400 mg, Tk. 8.50/Tab.

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### CLONAZEPAM

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**Indications :** most clinical forms of epilepsy in infants and children, specially partial seizures and absence seizures as an adjunctive therapy; panic and phobic disorders; anticipatory anxiety associated with alprazolam treatment; myoclonus; status epilepticus (see *section 7.6.2*)

**Contraindications:** respiratory depression; acute pulmonary insufficiency; alcohol intoxication

**Cautions:** respiratory, renal and hepatic diseases; those receiving barbit-urates; elderly, pregnancy and breast-feeding (mothers undergoing treatment should not breast feed); has been associated with the emergence of depression; avoid sudden withdrawal

**Interactions:** see *Appendix-2*

**Side-effects:** drowsiness, ataxia is dose related which usually subsides within 3 to 4 days; paradoxical behavioural changes like hyperactivity, irritability and aggressiveness

**Dose:** initially 1 mg (half in elderly) at night for 4 nights, increased over 2-4 weeks to a maintenance dose of 4-8 mg daily in divided doses; doses must be

## 7. CENTRAL NERVOUS SYSTEM

individually adjusted according to clinical response. CHILD, up to 1 year 250 micrograms increased as above to 0.5-1 mg, 1-5 years 250 micrograms increased up to 1-3 mg, 5-12 years 500 micrograms increased up to 3-6 mg

**OVERDOSE:** specific benzodiazepine antagonist flumazenil may be used in severe cases. Supervision of other vital function with supportive measure is necessary

### **Proprietary Preparations**

**Arotril (Aristo)**, Tab., 0.5 mg, Tk. 4.00/Tab.; 1mg, Tk. 5.00/Tab.; 2 mg, Tk. 6.00/Tab.  
**Cloma (Biopharma)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.  
**Clon (Globe)**, Tab., 2 mg, Tk. 6.00/Tab.; 0.5 mg, Tk. 3.50/Tab.  
**Clonapin (Popular)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.  
**Clonatrill (Healthcare)**, Tab., 0.5 mg, Tk. 5.00/Tab.; 1 mg, Tk. 6.00/Tab.; 2 mg, Tk. 4.00/Tab.  
**Clonazepam (Amico)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.  
**Clonil (RAK)**, Tab., 0.5 mg, Tk. 5.00/Tab.; 2 mg, Tk. 7.00/Tab.  
**Clonium (ACI)**, Tab., 0.5mg, Tk. 4.00/Tab.; 1 mg, Tk. 5.00/Tab.; 2 mg, Tk. 6.00/Tab.  
**Clopam (Sharif)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.  
**Cloron (Eskayef)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.  
**Denixil (Renata)**, Tab., 0.5 mg, Tk. 4.00/Tab.; 2 mg, Tk. 6.00/Tab.  
**Depanil (Rangs)**, Tab., 0.5mg, Tk. 3.00/Tab.; 2mg, Tk. 5.00/Tab.  
**Dipan (Albion)**, Tab., 0.5 mg, Tk. 2/Tab.; 2 mg, Tk. 4/Tab.  
**Disopan (Incepta)**, Tab., 0.5 mg, Tk. 4/Tab.; 1 mg, Tk. 5/Tab.; 2 mg, Tk. 6/Tab.  
**Epiclone (General)**, Tab., 0.5 mg, Tk. 4/Tab.; 1 mg, Tk. 6/Tab.; 2 mg, Tk. 7/Tab.  
**Epitra (Square)**, Paed. Drops, 2.5 mg/ml, Tk. 80.30/10 ml; Tab., 0.5 mg, Tk. 4.00/Tab.; 1 mg, Tk. 5.00/Tab.; 2 mg, Tk. 6.00/Tab.  
**Epnil (Novartis)**, Tab., 0.5 mg, Tk. 5.50/Tab.; 2 mg, Tk. 8.00/Tab.  
**Gepiril (Globe J)**, Tab., 2 mg, Tk. 5.00/Tab.  
**Leptic (Acme)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.  
**Lonapam (Delta)**, Tab., 0.5 mg, Tk. 2.00/Tab.; 2 mg, Tk. 4.00/Tab.  
**Lonazep (Sun)**, Tab., 0.5 mg, Tk. 4.00/Tab.; 2 mg, Tk. 6.00/Tab.  
**Myotril (Ibn Sina)**, Tab., 0.5 mg, Tk. 2.50/Tab.; 2 mg, Tk. 4.50/Tab.

**Pase (Opsonin)**, Tab., 0.5 mg, Tk. 3.01/Tab.; 1 mg, Tk. 3.76/Tab.; 2 mg, Tk. 4.51/Tab.; Paed. Drops, 12.5 mg/5ml, Tk. 60.38/10 ml  
**Rivo (Orion)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.  
**Rivotril (Radiant)**, Tab., 0.5 mg, Tk. 7.00/Tab.; 2 mg, Tk. 12.00/Tab.  
**Xetрил (Beximco)**, Tab., 0.5 mg, Tk. 3.00/Tab.; 2 mg, Tk. 5.00/Tab.

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### **GABAPENTIN**

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**Indications:** adjunctive treatment of partial seizures with or without secondary generalization not satisfactorily controlled with other antiepileptics, neuropathic pain

**Cautions:** avoid sudden withdrawal (taper off over at least 1 week); history of psychotic illness, elderly (may need to reduce dose), renal impairment, diabetes mellitus, false positive readings with some urinary protein tests, pregnancy

**Interactions:** see Appendix-2

**Side-effects:** drowsiness, dizziness, ataxia, fatigue, tremor, diplopia, amnesia, asthenia, paraesthesia, arthralgia, purpura, leucopenia, rhinitis, urinary incontinence,

**Dose:** epilepsy, 300mg on day 1, then 300mg twice daily on day 2, then 300mg 3 times daily (approx. every 8 hours) on day 3, then increased according to response in steps of 300mg daily (in 3 divided doses) to max. 2.4g daily, usual range 0.9-1.2 g daily; CHILD: 6-12 years (under specialist guidance) 10mg/kg on day 1, then 20mg/kg on day 2, then 25-35mg/kg daily (in divided doses approx. every 8 hours) maintenance 900 mg daily (body-weight 26-36Kg) or 1.2g daily (body-weight 37-50 kg)

For neuropathic pain, 300 mg on day 1, 300mg twice daily on day 2, 300mg 3 times daily on day 3, then increased according to response in steps of 300mg daily (in 3 divided doses) to max. 1.8g daily)

### **Proprietary Preparation**

**Gaba (Renata)**, Tab., 300 mg, Tk. 16.07/Tab.; 600 mg, Tk. 30.11/Tab.  
**Gabamax (Beacon)**, Tab., 300 mg, Tk. 16.00/Tab.



## 7. CENTRAL NERVOUS SYSTEM

**Gabantin** (*Sun*), Cap. , 100 mg, Tk. 6.00/Cap.; 300 mg, Tk. 16.10/Cap.  
**Gabapen** (*Incepta*), Tab. , 100 mg, Tk. 6.00/Tab.; 300 mg, Tk. 16.00/Tab. ; Syrup 5 mg/100 ml , Tk. 170.00/100 ml  
**Gabapentin** (*Albion*), Tab. , 300 mg, Tk. 16.00/Tab.; Tab. , 600 mg, Tk. 30.00/Tab.  
**Gabastar** (*Square*), Tab. , 600 mg, Tk. 30.11/Tab.; 300 mg, Tk. 16.06/Tab.; 100 mg, Tk. 6.02/Tab.; Syrup, 250 mg/5 ml , Tk. 100.00/50 ml  
**Gabatin**(*Unimed*), Tab. , 300 mg, Tk. 15.00/Tab.  
**Gabon** (*Acme*), Tab., 300 mg, Tk. 16.00/Tab.  
**Gaboton** (*Novartis*), Tab. , 300 mg, Tk. 16.10/Tab.  
**Gpentin** (*Opsonin*), Tab., 300 mg, Tk. 12.08/Tab.  
**Nepsy** (*Eskayef*), Tab., 300 mg, Tk. 16.00/Tab.  
**Neuropen** (*Drug Int*), Tab. , 300 mg, Tk. 16.00/Tab.

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### LAMOTRIGINE

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**Indications:** monotherapy and adjunctive treatment of partial seizures and primary and secondary generalized tonic-clonic seizures; Lennox-Gestaut syndrome associated seizures

**Cautions:** closely monitor hepatic, renal and clotting parameters and consider withdrawal if rash, fever, influenza-like symptoms, drowsiness, or worsening of seizure control develops; avoid abrupt withdrawal; elderly, pregnancy and breast-feeding

**Contraindication:** hepatic impairment

**Interactions :** *see Appendix-2*

**Side-effects:** skin rashes, influenzalike symptoms, drowsiness lymphadenopathy, leucopenia and thrombocytopenia, angioedema, photo-sensitivity, blurred vision, ataxia, aggression, tremor, confusion;

**Dose:** monotherapy, initially 25 mg daily for 14 days, increased to 50 mg daily for further 14 days, then increased by max. of 50-100 mg every 7-14 days; usual maintenance, 100-200 mg daily in 2-3 divided doses (up to max. 500 mg daily)

Adjunctive therapy *with* valproate: initially 25 mg every other day for 14 days then 25 mg daily for further 14

days, thereafter increased by max. of 25-50 mg every 7-14 days; usual maintenance, 100-200 mg daily in 1-2 divided doses

Adjunctive therapy *without* valproate: initially 50 mg daily for 14 days then 50 mg twice daily for further 14 days, thereafter increased by max. of 100 mg every 7-14 days; usual maintenance 200-400 mg daily in 2 divided doses (up to 700 mg daily may be required)

CHILD under 12 years, monotherapy not recommended; adjunct therapy *with* valproate: initially 150 micrograms/kg daily for 14 days then 300 micrograms/kg daily for further 14 days, thereafter increased by 300 micrograms/kg every 7-14 days; usual maintenance 1-5 mg/kg daily in 1-2 divided doses. CHILD under 12 years, adjunct therapy *without* valproate, initially 600 micrograms/kg daily in 2 divided doses for 14 days then 1.2 mg/kg daily in 2 divided doses for further 14 days, thereafter increased by max. of 1.2 mg/kg every 7-14 days; usual maintenance 5-15 mg/kg daily in 2 divided doses

#### **Proprietary Preparations**

**Lamitrin** (*ACI*), Tab., 50 mg , Tk. 18.00/Tab.;, 25 mg, Tk. 10.00/Tab.

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### LEVETIRACETAM

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**Indications:** partial seizures, or as an adjunctive therapy for partial, myoclonic and tonic clonic seizures.

**Cautions:** levetiracetam should not be discontinued suddenly because of the risk of increased seizure activity, patients who are started on therapy should be closely observed for clinical worsening, suicidal thoughts, or unusual changes

**Interactions :** *see Appendix-2*

**Side-effects:** headache, sleepiness, dizziness, and difficulty walking or moving

**Dose:** monotherapy of focal seizures, *by mouth or by intravenous infusion*, ADULT and CHILD over 16 years, initially 250 mg once daily

## 7. CENTRAL NERVOUS SYSTEM

Adjunctive therapy of focal seizures, by mouth, ADULT and CHILD over 12 years, body-weight over 50 kg, initially 250 mg twice daily, CHILD over 6 months, body-weight under 50 kg, initially 10 mg/kg once daily, increased by max. 10 mg/kg twice daily every 2 weeks

### Proprietary Preparations

**Citazar** (*ACI*), Tab., 500 mg, Tk. 25.09/Tab.; 250 mg, Tk. 15.06/Tab.  
**Eletam** (*Unimed*), Syrup, 500 mg/ 5 ml, Tk. 400.00/100 ml; Tab., 250 mg, Tk. 16.00/Tab.; Tab., 500 mg, Tk. 30.00/Tab.  
**Erata** (*Novartis*), Tab., 250 mg, Tk. 16.10/Tab.; Tab., 500 mg, Tk. 30.20/Tab.  
**Iracet** (*Square*), Tab., 500 mg, Tk. 25.00/Tab.; 250 mg, Tk. 15.00/Tab. Inj., 500 mg/ 5 ml, Tk. 40.00/vial; oral solu., 500 mg/ 5 ml, Tk. 200.00/50 ml  
**Leveron** (*Sanofi*), Tab., 500 mg, Tk. 30.00/Tab.; 250 mg, Tk. 16.00/Tab.

### PHENYTOIN <sup>[ED]</sup>

**Indications:** all forms of epilepsy except absence seizures; trigeminal neuralgia as an alternative to carbamazepine

**Cautions:** hepatic impairment, pregnancy, breast-feeding; avoid sudden withdrawal

**Interactions:** see Appendix-2

**Side-effects:** nausea, vomiting, mental confusion, tremor, insomnia, peripheral neuropathy, ataxia, slurred speech, nystagmus, gingival hypertrophy, coarse facies, acne and hirsutism, lupus erythematosus, hypocalcaemia, Stevens-Johnson syndrome; haematological effects including megaloblastic anaemia, leucopenia, thrombocytopenia, agranulocytosis, and aplastic anaemia;

**Dose:** by mouth, initially 100 mg/day, increased gradually as necessary; usual dose 200-500 mg daily. CHILD initially 5 mg/kg daily in 2 divided doses, usual dose range 4-8 mg/kg daily (max. 300 mg). by intravenous injection-see section 7.6.2 on status epilepticus

### Proprietary Preparations

**D-TOIN** (*Drug Int.*), Tab., 100 mg, Tk. 2/Tab.

**Diphedan** (*Ambee*), Tab. 100 mg, Tk.

2.01/Tab.; Susp. 125mg/5ml, Tk.

30.46/100ml

**Xentoin** (*Beacon*), Tab., 100 mg, Tk. 4/Tab.

### PREGABALIN

**Indications:** neuropathic pain associated with diabetic peripheral neuropathy and in combination with other drugs to treat partial onset seizures in adults.

**Cautions:** renal impairment, pregnancy, breast-feeding; avoid sudden withdrawal

**Side-effects:** dry mouth, constipation, vomiting, flatulence, oedema, dizziness, drowsiness, confusion, malaise, appetite changes, insomnia, sexual dysfunction, blurred vision,

**Dose:** neuropathic pain, ADULT over 18 years, initially 150 mg daily in 2-3 divided doses, mg daily in 2-3 divided doses; epilepsy, ADULT over 18 years, initially 25 mg twice daily; consult product literature

### Proprietary Preparations

**Gaba-P** (*Renata*), Cap, 50 mg, Tk. 12/Cap.; 75 mg, Tk. 16.07/Cap.

**Gabarol** (*ACI*), Cap, 75 mg, Tk. 16.06/Cap.;

50 mg, Tk. 12.00/Cap.; 25 mg, Tk. 8/Cap.;

150 mg, Tk. 30.11/Cap.; 100 mg,

Tk. 22.08/Cap.

**Lirica** (*Biopharma*), Cap., 75 mg, Tk. 16/Cap.

**Lyric** (*Healthcare*), Cap, 75 mg, Tk. 18/Cap.;

150 mg, Tk. 30/Cap.; 25 mg, Tk. 8/Cap.; 50

mg, Tk. 14/Cap.

**Myrica** (*Unimed*), Cap, 100 mg, Tk. 20/Cap.;

50 mg, Tk. 12/Cap.; 75 mg, Tk. 16/Cap.

**Nerfid** (*White Horse*), Cap, 75 mg, Tk.

16.00/Cap.; 50 mg, Tk. 12.00/Cap.

**Nervalin** (*Beximco*), Cap, 50 mg, Tk.

11.00/Cap.; 75 mg, Tk. 16.00/Cap.

**Neugaba** (*Sun*), Cap, 150 mg, Tk. 30.00/Cap.;

50 mg, Tk. 10.00/Cap.; 75 mg, Tk. 16.00/Cap.

**Neugalin** (*Acme*), Cap, 150 mg, Tk.

30.00/Cap.; 50 mg, Tk. 11.00/Cap.; 75 mg, Tk.

16.00/Cap.

**Neurega** (*Ibn Sina*), Cap, 100 mg, Tk.

22.00/Cap.; 25 mg, Tk. 8.00/Cap.; Cap, 50

mg, Tk. 13.00/Cap.; 75 mg, Tk. 17.00/Cap.

**Neurolin** (*Square*), Cap, 75 mg, Tk.

16.00/Cap.; 50 mg, Tk. 12.00/Cap.; 25 mg,

Tk. 8.00/Cap.; 150 mg, Tk. 30.11/Cap.

**Neurovan** (*Aristo*), Cap, 75 mg, Tk.

16.00/Cap.; 50 mg, Tk. 12.00/Cap.; 150 mg,

Tk. 30.00/Cap.

**Pegalin** (*Popular*), Cap, 100 mg, Tk.

22.08/Cap.; 75 mg, Tk. 16.06/Cap.; 25 mg,

Tk. 8.00/Cap.; 50 mg, Tk. 12.00/Cap.

## 7. CENTRAL NERVOUS SYSTEM

**Pegamax**(Astra ), Cap, 50 mg, Tk. 11.00/Cap.; Cap, 75 mg, Tk. 16.00/Cap.  
**Pegaron** (RAK), Cap, 50 mg, Tk. 12.00/Cap.; 75 mg, Tk. 16/Cap.  
**PG** (Eskayef), Cap, 75 mg, Tk. 16/Cap.; 50 mg, Tk. 11/Cap. ; 150 mg, Tk. 30/Cap.  
**Prebalin** (General), Cap, 150 mg, Tk. 30.11/Cap.; 50 mg, Tk. 12.00/Cap.; 75 mg, Tk. 16.00/Cap.  
**Preben** (Popular), Cap, 150 mg , Tk. 30.11/Cap.  
**Pregaba** (Opsonin), Cap, 150 mg, Tk. 22.64/Cap.; 25 mg, Tk. 6.02/Cap.; 50 mg, Tk. 9.06/Cap.; 75 mg, Tk. 12.08/Cap.  
**Pregaben** (Incepta), Cap, 150 mg, Tk. 30/Cap.; 50 mg, Tk. 12/Cap. ; 75 mg, Tk. 16/Cap.  
**Pregabid** (Albion), Cap, 100 mg , Tk. 22.00/Cap.; 50 mg, Tk. 12.05/Cap. ; 75 mg, Tk. 16.07/Cap.  
**Pregadel** (Delta), Cap, 50 mg, Tk. 10/Cap.; 75 mg, Tk. 15.00/Cap.  
**Pregalex** (Sharif), Cap, 150 mg, Tk. 30/Cap.; 50 mg, Tk. 11/Cap. ; Cap, 75 mg, Tk. 16/Cap.  
**Pregan** (Navana), Cap, 50 mg, Tk. 11.00/Cap.; 75 mg, Tk. 16/Cap.  
**Prelica** (Radiant), Cap, 150 mg, Tk. 35.00/Cap. ; 50 mg, Tk. 14.50/Cap. ; 75 mg, Tk. 19.00/Cap.  
**Prelin** (Drug Int.), Cap, 150 mg, Tk. 30/Cap. ; 50 mg, Tk. 11/Cap.; 75 mg, Tk. 16/Cap.;  
**Pretor** (Sanofi), Cap, 150 mg, Tk. 30/Cap. ; 50 mg, Tk. 12/Cap.; 75 mg, Tk. 16/Cap.  
**Pyrica** (Pharmasia), Cap, 75mg, Tk.16/Cap.  
**Regab** (Beacon), Cap.,25 mg, Tk. 8/Cap.; 50 mg, Tk. 12/Cap.;, 75 mg, Tk. 16/Cap.  
**Xablin** (Novartis), Cap, 75 mg, Tk. 17.10/Cap.  
**Xil** (Orion), Cap, 50 mg, Tk. 8/Cap. ; 75 mg, Tk. 10.04/Cap.

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### SODIUM VALPORATE<sup>[ED]</sup>

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**Indications:** all forms of epilepsy

**Cautions:** monitor liver functions before and 6 months after initiation of therapy (especially in children under 3 years of age where there has been reports of fatal hepatic failure); undue potential for bleeding; renal impairment; pregnancy; breast feeding; SLE; avoid sudden withdrawal

**Contraindications:** active liver disease, family history of severe hepatic dysfunction

**Interactions:** see Appendix-2

**Side-effects:** gastric irritation, ataxia and tremor, weight gain; transient hair

loss, oedema, thrombocy-topenia, leucopenia, pancytopenia, amenorrhoea, gynae-comastia, toxic epidermal necrolysis, hearing loss, vasculitis Stevens-Johnson syndrome.

**Dose:** initially 400 mg daily in 2 divided doses, preferably after food, increasing by 200 mg at 3 day intervals to a max. of 2g daily in divided doses; usual maintenance dose 800-1600 mg daily. CHILD up to 20 kg, initially 10 mg/kg daily in divided doses, may be increase to 20 mg/kg (further increase requires regular plasma concentration monitoring); over 20 kg, initially 400 mg daily in 2 divided doses, increase until control (usually in range of 20-30 mg/kg/day); max. 35 mg/kg/day

### Proprietary Preparations

**Convules** (Opsonin), CR Tab., 300 mg, Tk. 4.53/Tab.; 200 mg, Tk. 3.02/Tab.; 500 mg, Tk. 7.55/Tab.; Syrup, 200 mg/5 ml, Tk. 56.6/100 ml  
**Encorate** (Sun), Tab. ,Tk. 3.00/Tab.  
**Encorate chrono** (Sun), Tab. , 200 mg, Tk. 4.50/Tab.; 300 mg, Tk. 7.00/Tab.; 500 mg, Tk. 11.00/Tab.  
**Epilim** (Sanofi), Syrup, 200 mg/5 ml, Tk. 80.30/100 ml  
**Epilim chrono** (Sanofi), Tab., 500 mg, Tk. 11.00/Tab.; 300 mg, Tk. 7.00/Tab.; 200 mg, Tk. 4.50/Tab.  
**Epival** (Albion), Tab. , 200 mg, Tk. 3.00/Tab.  
**Epival Chrono** (Albion), CR Tab. , 200 mg, Tk. 4.50/Tab. ;CR Tab. , 300 mg, Tk. 7.00/Tab. ; CR Tab. , 500 mg, Tk. 11.00/Tab.  
**Proval** (General), Tab. , 200 mg, Tk. 2.51/Tab.;Syrup, 200 mg/5 ml, Tk. 75.28/100ml  
**Sodival** (ACI), Syrup, 200 mg/5 ml , Tk. 80.00/100 ml ;Tab. , 200mg , Tk. 2.51/Tab.  
**Valex** (Incepta), CR Tab. , 200 mg, Tk. 4.50/Tab.; CR Tab. , 300 mg, Tk. 7.00/Tab.; Tab. , 200 mg, Tk. 3.00/Tab.; CR Tab. , 500 mg, Tk. 11.00/Tab.; Syrup, 200 mg/5 ml, Tk. 80.00/100 ml  
**Valoate** (Square), Syrup, 200 mg/5 ml, Tk. 75.28/100 ml ;CR Tab. , 500 mg, Tk. 10.04/Tab.; CR Tab. , 300 mg, Tk. 6.02/Tab.; CR Tab. , 200 mg, Tk. 4.01/Tab.

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### TOPIRAMATE

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**Indications:** adjunctive therapy for partial seizures (LRE); seizures associ-

## 7. CENTRAL NERVOUS SYSTEM

ated with Lennox-Gastaut syndrome; idiopathic GTCS

**Cautions:** avoid abrupt withdrawal; ensure adequate hydration; pregnancy; hepatic or renal impairment

**Contraindication:** breast-feeding

**Interactions :** see Appendix-2

**Side-effects:** nausea, anorexia, abdominal pain, weight loss; confusion, impaired speech, depression, ataxia, paraesthesia, fatigue, asthenia, visual disturbances leucopenia

**Dose:** initially 25 mg daily for 1 week then increased in steps of 25-50 mg daily at intervals of 1-2 weeks in 2 divided doses; max. 800mg daily. CHILD 2-16 years, initially 25 mg at night for one week then increased in steps of 1-3 mg/kg daily according to response at intervals of 1-2 weeks and taken in 2 divided doses; recommended dose range 5-9 mg/kg daily in 2 divided doses

### Proprietary Preparations

**Etopira** (Unimed), Tab., 25 mg, Tk. 5.00/Tab.; 50 mg, Tk. 10.00/Tab.

**Piramed** (Square), Tab., 200 mg, Tk. 15.05/Tab.; 25 mg, Tk. 3.01/Tab.

**Topirva** (Incepta), Tab., 25 mg, Tk. 3.00/Tab.; 50 mg, Tk. 5.00/Tab.

**Topmate** (Renata), Tab., 25 mg, Tk. 4.00/Tab.; 50 mg, Tk. 6.00/Tab.

### 7.6.2 STATUS EPILEPTICUS

Status epilepticus should initially be treated with intravenous **Diazepam**, used with caution because of the risk of respiratory depression. It is administered as small repeated dosage till seizure is controlled. Intravenous **lorazepam** or **clonazepam** can also be used where available. When seizure continues for considerable time despite intravenous diazepam or lorazepam or clonazepam, **phenytoin** may be tried by slow intravenous injection followed by the maintenance dosage. Intramuscular use of these drugs is not recommended because absorption is too slow for treatment of status epilepticus. Intravenous **phenobarbitone** has also been used as an alternative to phenytoin.

### DIAZEPAM <sup>[ED]</sup>[CD]

(see also section 7.1 and 7.2)

**Indications:** status epilepticus; convulsions due to poisoning; for other indications see section 7.2

**Cautions:** intravenous diazepam is potentially hazardous, calling for close and constant observation and best carried out with ICU facilities in a hospital, see section 7.2

**Contraindications:** see section 7.2 on psychiatric drugs.

**Side-effects:** hypotension and apnoea; see also section 7.2

**Interactions :** see Appendix-2

**Dose:** by intravenous injection, 10-20 mg at a rate of 0.5 ml (2.5 mg) per 30 seconds, repeated if necessary after 30-60 minutes; may be followed by intravenous infusion to max. 3 mg/kg over 24 hours; CHILD 200-300 micrograms/kg or 1 mg per year of age

### Proprietary Preparations

see section 7.2.

### PHENOBARBITONE/ PHENOBARBITONE SODIUM <sup>[ED]</sup>[CD]

**Indications:** all forms of epilepsy except absence seizures; status epilepticus; febrile convulsion

**Cautions:** pregnancy and lactation

**Contraindications:** drug dependence, liver disease, renal disease

**Interactions:** see Appendix-2

**Side-effects:** nausea, vomiting, hyperactivity, cognition impairments, folate deficiency, decreased libido, dependence

**Dose:** by mouth, 30-180 mg at night. CHILD, 5-8 mg/kg daily

by intramuscular injection, 200 mg, repeated after 6 hours if necessary. CHILD 15/kg as a single dose

by intravenous injection in status epilepticus, (dilute injection 1 in 10 with water for injection), 10 mg/kg at a rate of not more than 100 mg/minute; max. 1 gram

## 7. CENTRAL NERVOUS SYSTEM

### Proprietary Preparations

**Barbipan** (*Albion*), Elixir, 20mg/5ml Tk. 56.00/100 ml; Tab. , 15 mg, Tk. 0.57/Tab.; 30 mg, Tk. 0.78/Tab. ; 60 mg, Tk. 1.14/Tab.  
**Barbit** (*Incepta*), Elixir, 20mg/5ml , Tk. 29.06/50 ml; Tk. 57.00/100 ml ; Tab. , 30 mg, Tk. 0.78/Tab.; Tab. , 60 mg, Tk. 1.14/Tab.; Inj., 200 mg/ml , Tk. 16.00/Amp.  
**Emer** (*Opsonin*), Tab., 30 mg, Tk. 0.59/Tab.; Tab., 60 mg, Tk. 0.86/Tab. Elixir, 20mg/5ml Tk. 43.10/100 ml ;  
**Epinal** (*Square*), Tab. , 60 mg, Tk. 1.15/Tab.; Tab. , 30 mg, Tk. 0.78/Tab.; Inj., 200 mg/ml , Tk. 16.00/vial  
**G-Phenobarbiton** (*Gonoshasthaya*), Tab. , 30 mg, Tk.0.70/Tab.;Inj., 200 mg/ml , Tk.13.00/Amp.  
**Pheno** (*Delta*), Tab. , 30 mg, Tk. 0.78/Tab.;Tab. , 60 mg, Tk. 1.14/Tab.  
**Phenoba** (*Biopharma*), Tab. , 60 mg, Tk. 1.14/Tab.; Tab. , 30 mg, Tk. 0.78/Tab.  
**Phenason** (*Jayson*), Tab. , 30 mg, Tk. 0.78/Tab.

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### 7.7 DRUGS USED IN PARKINSONISM

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- 7.7.1 DOPAMINERGIC DRUGS
- 7.7.2 ANTIMUSCARINIC DRUGS
- 7.7.3 DRUGS USED IN ESSENTIAL TREMOR, CHOREA, TICS AND RELATED DISORDERS

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#### 7.7.1 DOPAMINERGIC DRUGS

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**Levodopa** used along with a dopa-decarboxylase inhibitor is the treatment of choice for patients disabled by idiopathic Parkinson's disease. It is in combination with **dopa-decarboxylase inhibitor** useful in the elderly or frail patients with other significant disease and in those with more severe symptoms. It is effective and well tolerated in the majority of patients. It is also less valuable in patients with post-encephalitic and drug induced Parkinsonism. Levodopa acts as a surrogate of DOPA competing within, and thus interferes with the formation of dopamine in the CNS. The dopa-decarboxylase inhibitor given with levodopa is carbidopa (as in **co-careldopa**) or benserazide (as in **co-beneldopa**).

Levodopa therapy should be initiated with low doses and gradually increased, by small increments, at intervals of 2 to 3 days. The final dose is usually a compromise between increase mobility and dose-limiting side-effects. Intervals between doses may be critical and should be chosen to suit needs of individual patients. Nausea and vomiting are rarely dose-limiting factors but if it happens, drug should be taken after meals. Domperidone (see sec. 2.2) may be useful in controlling vomiting. The most frequent dose limiting side-effects of levodopa are involuntary movements and psychiatric complications.

During the first 6-18 months of levodopa therapy there may be a slow improvement in the response of the patient, which is maintained for 1½ to 2 years; thereafter a slow decline may occur. Particularly troublesome is the 'on-off' effect, the incidence of which increases as treatment progresses. It is characterized by fluctuations in performance with normal performance during the 'on' period and immobility during the 'off' period. 'End-of-dose' deterioration may also occur where the duration of benefit after each dose becomes progressively shorter. Controlled-release preparations may help in this situation.

**Ropinirole** is a dopamine agonist of the non-ergoline class of medications. It is used in the treatment of Parkinson's disease and restless legs syndrome

**Selegiline** is a monoamine-oxidase-B inhibitor used in severe parkinsonism in conjunction with levodopa to reduce 'end-of-dose' deterioration. Early treatment with selegiline may delay the need for levodopa therapy but there is no convincing evidence that it delays disease progression. Selegiline given with levodopa may be associated with increased mortality in the longer term, but this remains to be confirmed.

**Entacapone** has recently been introduced for use as an adjunct to co-careldopa for patients who experience 'end-of-dose' motor fluctuation and cannot be stabilised with adjustment of levodopa dose schedule.

## 7. CENTRAL NERVOUS SYSTEM

The ergot derivative, **bromocriptine**, although effective, has no advantage over levodopa. It should be reserved for patients in whom levodopa alone is no longer adequate or who despite careful titration cannot tolerate levodopa. It is sometimes useful in reducing 'off' periods and in ameliorating fluctuations in the later stage of Parkinson's disease. Its use is often limited by its side-effects; when used with levodopa, abnormal involuntary movements and confusional states are common.

**Amantadine** has modest antiparkinsonian effects. It improves mild bradykinetic disabilities as well as tremor and rigidity. Unfortunately only a small proportion of patients derive much benefit from this drug and tolerance to it occurs. However it has the advantage of being relatively free from untoward side-effects.

**Pramipexole** is a dopamine agonist of the non-ergoline class indicated for treating Parkinson's disease and restless legs syndrome

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### AMANTADINE HYDROCHLORIDE

(see also section 1.3.3)

**Indications:** Parkinson's disease  
Antiviral. For other indication; see also section 1.3.3

**Cautions:** hepatic or renal impairment, congestive heart disease, confusions or hallucinatory states, elderly; avoid abrupt withdrawal

**Contraindications:** epilepsy, history of gastric ulceration, severe renal impairment; pregnancy, breast-feeding

**Interactions:** see Appendix-2

**Side-effects:** anorexia, nausea, nervousness, inability to concentrate, insomnia, dizziness, convulsions, hallucinations, blurred vision, gastrointestinal disturbances, peripheral oedema.

**Dose:** 100 mg daily increased after one week to 100 mg twice daily, usually in conjunction with other treatment; some patients may require higher doses, max. 400 mg daily

### Generic Preparation

Capsule. 100mg; Syrup. 1mg/100ml

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### BROMOCRIPTINE

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**Indications:** parkinsonism, endocrine disorders (see section 6.5.1)

**Cautions; Contra-indications & Side-effects:** see section 6.5.1

**Interactions:** see Appendix-2

**Dose:** first week 1-1.25 mg at night, second week 2-2.5 mg at night, third week 2.5 mg 3 times daily then increasing by 2.5 mg every 3-14 days according to response to a usual range of 10-40 mg daily; taken with food

### Proprietary Preparations

**Bromolac** (*Square*), Tab., 2.5 mg, Tk. 12.00/Tab.

**Criptine** (*Renata*), Tab., 2.5 mg, Tk. 12.00/Tab.

**Bromodel** (*Opsonin*), Tab., 2.5 mg, Tk. 7.55/Tab.

**Bromergon** (*Novartis*), Tab., 2.5 mg, Tk. 14.00/Tab.

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### CO-CARELDOPA

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This is a combination of levodopa and carbidopa at a proportion of 10:1.

**Indications:** parkinson's disease

**Cautions:** pulmonary disease, peptic ulcer, cardiovascular disease, osteomalacia, diabetes mellitus, open angle glauc-oma, skin melanoma, psychiatric illness; avoid abrupt withdrawal; pregnancy and breast-feeding

**Contraindication:** closed-angle glaucoma

**Interactions:** see Appendix-2

**Side-effects:** anorexia, nausea vomiting, insomnia, agitation, postural hypotension, dizziness, tachycardia, abnormal involun-tary movements and psychiatric symptoms, drowsiness, peripheral neuropathy, taste disturbance, pruritus,

**Dose:** Expressed as levodopa, initially 100mg (with carbidopa 25 mg) 3 times daily, increased by 50-100 mg (with carbidopa 12.5 or 25 mg) daily or on

## 7. CENTRAL NERVOUS SYSTEM

alternatedays according to response, up to 800 mg (with carbidopa 200 mg) daily in divided doses

**Note:** Carbidopa 70-100 mg daily is necessary to achieve full inhibition of dopa-decarboxylase

### **Proprietary Preparations**

**Aldopa** (*Albion*), Tab. , 25 mg + 250 mg, Tk. 6.00/Tab.

**Co-Dopa** (*Unimed*), Tab. , 10 mg + 100 mg, Tk. 7.00/Tab.; 25 mg + 250 mg, Tk. 10.00/Tab.

**D-Dopa** (*Drug Int.*), Tab. , 10 mg + 100 mg, Tk. 5.00/Tab.; 25 mg + 250 mg, Tk. 6.00/Tab.

**Levopa** (*Acme*), Tab., 10 mg + 100 mg, Tk. 4.00/Tab.; 25 mg + 250 mg, Tk. 7.50/Tab.

**Syndopa** (*Sun*), CR Tab. , 25 mg + 100 mg, Tk. 10.00/Tab.; Tab. , 10 mg + 100 mg, Tk. 7.00/Tab.

CR Tab. , 50 mg + 200 mg, Tk. 12.50/Tab.

**Syndopa** (*Sun*), Tab. , 25 mg + 250 mg, Tk. 10.00/Tab.

### Levodopa+Carbidopa+Entacapone

**Tridopa** (*ACI*), Tab. , 50mg+12.5mg+200mg Tk. 15.00/Tab.; 200mg+50mg+200mg , Tk.

40.00/Tab.; 150mg+37.5mg+200mg , Tk.

30.00/Tab. ;100mg+25mg+200mg , Tk.

25.00/Tab.

## **ENTACAPONE**

**Indications:** adjunct to levodopa in Parkinson's disease patients who have 'end-of-dose' motor fluctuations

**Cautions:** concurrent levodopa dose may need to be reduced by about 10-30%

**Contra-indications:** pregnancy and breast-feeding; hepatic impairment; pheochromocytoma; concomitant use of non-selective MAO-A or MAO-B inhibitors; history of neuroleptic malignant syndrome or non-traumatic rhabdomyolysis

**Interactions:** see *Appendix-2*

**Side-effects:** nausea, vomiting, abdominal pain, constipation, diarrhea, urine may be coloured reddish-brown, dry mouth, dyskinesias; dizziness; rarely elevated liver enzymes; anaemia reported

**Dose:** 200 mg with each dose of levodopa with dopa-decarboxylase inhibitor; max. 2 g daily

### **Proprietary Preparation**

**Comtan**<sup>®</sup> (*Orion*), Tab. 200 mg, Tk. 92.00/Tab

## **PRAMIPEXOLE**

**Indications:** Parkinson's disease and restless legs syndrome

**Contraindications:** renal impairment, hypotension

**Interactions:** see *Appendix-2*

**Side effects:** nausea, vomiting, sedation, somnolence, weight loss, insomnia, hallucinations, unusual tiredness

**Dose:** Initial dose: 0.125 mg orally three times a day with or without food.

### **Proprietary Preparations**

**Parixol** (*ACI*), Tab. 88 microgram, Tk. 2.01/Tab, 180 microgram, Tk. 6.02/Tab

## **ROPINIROLE**

**Indications:** Parkinson's disease, extrapyramidal symptoms. It can also reduce the side effects caused by selective serotonin reuptake inhibitors,

**Contraindications:** known hypersensitivity to ropinirole

**Interactions:** see *Appendix-2*

**Side effects:** nausea, dizziness, hallucinations, orthostatic hypotension, and sudden sleep attacks during the daytime.

**Dose:** ADULT : 0.25 mg orally three times daily for Parkinson's Diseases:

### **Proprietary Preparations**

**Perkirol** (*Square*), Tab. , 2 mg, Tk. 6.02/Tab.; 0.25 mg, Tk. 2.01/Tab.

**Repitol** (*Beximco*), Tab. , 0.25 mg , Tk. 2.00/Tab. ; 2 mg, Tk. 10.00/Tab.

**Ropinol** (*Incepta*), Tab. , 1 mg, Tk. 2.00/Tab.; 2 mg, Tk. 4.00/Tab. ; 4 mg, Tk. 6.00/Tab

## 7. CENTRAL NERVOUS SYSTEM

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### SELEGILINE HYDROCHLORIDE

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**Indications:** Parkinson's disease symptomatic parkinsonism

**Cautions:** gastric and duodenal ulcer, uncontrolled hypertension, arrhythmias, angina, psychosis, pregnancy and breast-feeding

**Interactions:** see Appendix-2

**Side-effects:** constipation, diarrhoea, nausea and vomiting, dry mouth, sore throat, confusion, psychosis, vertigo, sleep disturbances, back pain, difficulty in micturation,

**Dose:** 10 mg in the morning or 5 mg at breakfast and midday

**Generic Preparation**

Tablet, 5 mg; 10 mg

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### 7.7.2 ANTIMUSCARINIC DRUGS

(see also section 8.1.3 & 2.2)

Antimuscarinic drugs are less effective than levodopa in idiopathic Parkinson's disease although they may supplement its action. These drugs improve the tremor in patients with mild Parkinson's disease by blocking the excess central cholinergic effect which might occur in parkinsonism due to deficiency of dopamine in CNS. Antimuscarinic drugs are indicated in parkinsonism induced by antipsychotic drugs. The most commonly used antimuscarinic drugs are **Benzhexol, benztropin, orphenadrine** and **trihexyphenidyl**.

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### PROCYCLIDINE HYDROCHLORIDE

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**Indications:** Parkinsonism, drug-induced extrapyramidal symptoms (EPS)

**Cautions:** cardiovascular diseases, hepatic or renal impairment, elderly; avoid sudden withdrawal; liable to abuse

**Contraindications:** narrow angle glaucoma, enlarged prostate, and myasthenia gravis

**Interactions:** see Appendix-2

**Side-effects:** dry mouth, constipation, blurring of vision, urinary, retention, postural hypotension, tachycardia

**Dose:** *by mouth*, 2.5 mg 3 times daily, gradually increase if necessary; usual max. 30 mg daily. ELDERLY, preferably reduced doses

*by intramuscular injection* in acute dystonia, 5-10 mg repeated if necessary after 20-30 minutes; max. 20 mg daily. ELDERLY, reduce dose

**Proprietary Preparations**

**Cyclid** (*Incepta*), Tab., 5 mg, Tk. 1.00/Tab.; Inj., 10 mg/2 ml, Tk. 30.00/Amp.

**Extranil** (*General*), Inj., 10 mg/2 ml, Tk. 30.00/Amp.; Tab., 5 mg, Tk. 0.76/Tab.

**Kdrin** (*Opsonin*), Inj., 10 mg/2 ml, Tk. 22.64/Amp.; Tab., 5 mg, Tk. 0.32/Tab.

**Kemadrin** (*GSK*), Tab., 5 mg, Tk. 1.63/Tab.

**Perkinil** (*Square*), Tab., 5 mg, Tk. 1.00/Tab.; Inj., 10 mg/2 ml, Tk. 30.11/Amp.

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### TRIHEXYPHENIDYL

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**Indications:** Parkinson disease and other Parkinson-like disorders when used in combination with other drugs; Parkinson-like side effects of certain drugs

**Cautions:** may be abused due to a short acting mood-elevating and euphoriant effect; obstructive diseases of the urogenital tract, known history of seizures

**Contraindications:** hypersensitivity, narrow angle glaucoma, ileus, under 18 years of age

**Interactions:** see Appendix-2

**Side effects :** drowsiness, vertigo, headache, and dizziness are frequent, delirium and confusion.

**Dose:** ADULT: 4 to 10 mg orally daily

**Proprietary Preparations**

**Hexinor** (*Beacon*), Tab., 2 mg, Tk. 5/Tab.

**Parkinfen** (*Unimed*), Tab., 2 mg, Tk. 5/Tab.; 5 mg, Tk. 12.00/Tab.

**Trihexy** (*Incepta*), Tab., 2 mg, Tk. 5/Tab.; 5 mg, Tk. 16.67/Tab.



## 7. CENTRAL NERVOUS SYSTEM

### 7.7.3 DRUGS USED IN ESSENTIAL TREMOR CHOREA, TICS AND RELATED DISORDERS

**Haloperidol, clonidine, sulpiride, chlorpromazine, propranolol and piracetam** are used in this type of disorders. Haloperidol (see section 7.2) may relieve motor tics and some choreas including Gilles de la Tourette syndrome in dosage of 0.5-1.5 mg 3 times daily, adjusted according to response up to 10 mg daily.

Propranolol or some other beta-adrenoceptor blocking agent (see section 3.1) is indicated for treating essential tremors associated with anxiety or thyrotoxicosis in a dosage of 40mg 2-3 times daily

**Piracetam** is used as an adjunctive treatment for myoclonus of cortical origin.

#### PIRACETAM

**Indications:** adjunctive treatment of cortical myoclonus

**Cautions:** avoid abrupt withdrawal; elderly; renal impairment (avoid if severe)

**Contraindications:** hepatic and renal impairment; pregnancy and breast-feeding

**Interactions:** see Appendix-2

**Side-effects:** diarrhoea, weight gain; somnolence, insomnia, nervousness, depression; hyperkinesia; rash

**Dose:** initially 7.2 g daily in 2-3 divided doses, increased according to response by 4.8 g daily every 3-4 days to max. 20g daily. CHILD under 16 years not recommended

#### Proprietary Preparations

**Juvain (Opsonin)**, Tab., 800 mg, Tk. 4.53/Tab.; Syrup, 500 mg/5 ml, Tk. 113.21/100ml

**Memopil (ACI)**, Tab., 800 mg, Tk. 6.02/Tab.; Syrup, 500 mg/5 ml, Tk. 150.57/100 ml

**Neurolep (Square)**, Tab., 800 mg, Tk. 6.02/Tab.; Syrup, 500 mg / 5 ml, Tk. 150.57/100 ml

**Piramax (Aristo)**, Tab., 800 mg, Tk. 6.00/Tab.

**Piratam (General)**, Tab., 800 mg, Tk. 6.02/Tab.; Syrup, 500mg/5ml, Tk.150.00/100ml

### 7.8 DRUGS USED IN NAUSEA, VOMITING AND VERTIGO

In many cases, the underlying cause of nausea and vertigo is common. This is why the drugs used in nausea and vomiting (antiemetics) and those for vertigo are overlapping and described together. Most of the conventional antiemetics like **hyoscine, promethazine, cinnarizine, metoclopramide, phenothiazines** are significantly sedating with hyosine and antihistamines having the additional anticholinergic problems of dry mouth, blurring of vision and retention of urine.

**Hyoscine** (used as the hydrobromide, see section 8.1.3) can be a very effective and useful antiemetic in specific situation like motion sickness but it probably has more sedation and other side effects than antihistamines. **Antihistamines** are slightly less effective but are generally better tolerated. There is no evidence that one antihistamine is superior to another but their duration of action, capacity to cross the blood-brain barrier and incidence of adverse effects differ. Nausea in the first trimester of pregnancy does not require drug therapy. On rare occasions if vomiting is severe, an antihistamine or a phenothiazine (e.g. promethazine) may be required.

The **phenothiazines** are dopamine antagonists and act centrally by blocking the chemoreceptor trigger zone. They are of considerable value for the prophylaxis and treatment of nausea and vomiting associated with diffuse neoplastic disease, radiation sickness, and the emesis caused by drugs such as opioid analgesics, general anaesthetics and cytotoxic drugs. **Prochlorperazine** and **trifluperazine** are less sedating than chlorpromazine but severe dystonic reactions sometimes occur especially in children.

**Metoclopramide** is as effective antiemetic as phenothiazines but has in

## 7. CENTRAL NERVOUS SYSTEM

addition a peripheral action on the gut and therefore may be superior to the phenothiazines in the emesis associated with gastroduodenal, hepatic and biliary diseases. As with the phenothiazines, metoclopramide may induce acute dystonic reaction especially in children.

**Domperidon** is used for the relief of nausea and vomiting, especially when associated with cytotoxic drug therapy. It has the advantage over metoclopramide and the phenothiazines of being less likely to cause central effects such as sedation and dystonic reactions because it does not readily cross the blood-brain barrier. It may be given for the treatment of vomiting induced by levodopa and bromocriptine in patients of parkinsonism.

**Granisetron, ondansetron, and palonosetron** are specific-receptor antagonists which block 5HT<sub>3</sub> receptors in the gastro-intestinal tract and in the CNS.

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### CHLORPROMAZINE<sup>[ED]</sup>

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(see also section 7.2)

**Indications:** nausea and vomiting of terminal illness where other drugs have failed or are not available; other indications, see section 7.2

**Cautions; contraindications; side-effects:** see section 7.2

**Interactions:** see Appendix-2

**Dose:** by mouth, 10-25 mg every 4-6 hours. CHILD 500 µg/kg every 4-6 hours (1-5 years max. 40 mg daily, 6-12 years max. 75 mg daily)

by deep intramuscular injection initially 25 mg then 25-50 mg every 3-4 hours until vomiting stops. CHILD 500 micrograms/kg every 6-8 hours (1-5 years max. 40 mg daily, 6-12 years max. 75 mg daily)

#### Proprietary Preparations

**Gevril** (Albion), Syrup, 0.5 gm/100 ml, Tk. 15.00/100 ml

**Largactil** (Sanofi), Inj., 25 mg/ml, Tk. 4.12/Amp.; Tab., 50 mg, Tk. 0.60/Tab.; 25 mg, Tk. 0.41/Tab.; Tab., 100 mg, Tk. 1.01/Tab.

**Opsonil** (Opsonin), Tab., 100 mg, Tk. 0.76/Tab.; 50 mg, Tk. 0.45/Tab.; Inj., 50 mg/2 ml, Tk. 3.02/Amp

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### CINNARIZINE

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**Indications:** vestibular disorders, such as Meinner's disease, vestibular neuritis, paroxysmal positional vertigo, motion sickness; vascular disease

**Cautions and contraindications:** prostatic hypertrophy, urinary retention, glaucoma, hepatic disease, epilepsy; porphyria, severe heart failure

**Interactions:** see Appendix-2

**Side-effects:** drowsiness, dry mouth, blurred vision, allergic skin reactions, fatigue; rarely extrapyramidal symptoms in elderly on prolonged therapy

**Dose:** 15-30 mg 3 times daily. CHILD 5-12 years, half adult dose

#### Proprietary Preparations

**Cinaron** (Square), 15 mg, Tk. 1.00/Tab.

**Cinaryl** (Opsonin), Tab., 15 mg, Tk. 0.75/Tab.

**Cinarzin** (Ibn Sina), Tab., 15 mg, Tk. 1/Tab.

**Cinazin** (Acme), Tab., 15 mg, Tk. 0.70/Tab.

**Cinnarizine** (Albion), Tab., 15 mg, Tk. 1/Tab.

**Cinrim** (Supreme), Tab., 15 mg, Tk. 1/Tab.

**Inarzin** (Beximco), Tab., 15 mg, Tk. 0.90/Tab.

**Suzaron** (Rephco), Tab., 15 mg, Tk. 1/Tab.

**Zincin** (Aristo), Tab., 15 mg, Tk. 1.00/Tab.

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### DOMPERIDONE

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see notes above and also section 7.5.4.1

**Indications, Cautions,**

**Contraindications and side-effects:**

see section 7.5.4.1

**Interactions:** see Appendix-2

**Dose:** by mouth, acute nausea and vomiting, 10-20 mg every 4-8 hours, max. period of treatment 12 weeks

CHILD nausea and vomiting following cytotoxic therapy or radiotherapy only, 200-400 micrograms/kg every 4-8 hours.

By rectum as suppositories, nausea and vomiting, 30-60 mg every 4-8 hours. CHILD following cytotoxic therapy or radiotherapy, over 2 years bodyweight 10-15 kg max. 15 mg twice daily, body weight 15-25 kg max. 30 mg twice daily, body weight 25-45 kg max 30 mg 3-4

## 7. CENTRAL NERVOUS SYSTEM

times daily; suppositories may be cut up for children.

**Proprietary Preparations**  
see section 2.2

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### GRANISETRON

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**Indications:** see under dose

**Cautions:** pregnancy and breast-feeding

**Interactions:** see Appendix-2

**Side-effects:** constipations, headache, rash; transient increases in liver enzymes; hypersensitivity reactions reported.

**Dose:** nausea and vomiting induced by cytotoxic chemotherapy or radiotherapy, by mouth 1-2 mg within 1 hour before start of treatment, then 2 mg daily in 1-2 divided doses during treatment; when intravenous infusion also used, max. combined total 9 mg in 24 hours; CHILD 20micrograms/kg (max. 1 mg) within 1 hour before start of treatment, then 20 micrograms/kg (max. 1 mg) twice daily for up to 5 days during treatment

*By intravenous injection* (diluted in 15 ml sodium chloride 0.9% and given over not less than 30 seconds) or by intravenous infusion (over 5 minutes), prevention, 3 mg before start of cytotoxic therapy (up to 2 additional 3 mg doses may be given within 24 hours); treatment, as for prevention (the two additional doses must not be given less than 10 minutes apart); max. 9 mg in 24 hours; CHILD, *by intravenous infusion*, (over 5 minutes), prevention, 40 micrograms/kg (max. 3 mg) before start of cytotoxic therapy; treatment as for prevention-one additional dose of 40 micrograms/kg (max. 3mg) may be given within 24 hours (not less than 10 minutes after initial dose)

Postoperative nausea and vomiting, by intravenous injection (diluted to 5ml and given over 30 seconds), prevention, 1 mg before induction of anaesthesia; treatment, 1 mg, given as for prevention; max. 2 mg in one day; CHILD not recommended.

### Proprietary Preparation

**Naurif** (*Square*), Inj., 1 mg/ml, Tk. 48.19/1 ml Inj. Tab., 1 mg, Tk. 28.10/Tab.

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### MECLIZINE HYDROCHLORIDE

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**Indications:** nausea, vomiting, motion sickness, vertigo

**Cautions:** patients with asthma, bronchitis, emphysema, enlarged prostate, glaucoma or urinary tract blockage should take Meclizine (like other antiemetics) with caution; driving and effects of alcohol enhanced.

**Contraindications:** hypersensitive to Meclizine

**Interactions:** see Appendix-2

**Side-effects:** drowsiness, dry mouth, and blurred vision

**Dose:** nausea and vomiting: 25-100 mg daily (single dose) or directed by physician; Motion sickness: 25-50 mg 1 hour before travel. The dose may be repeated every 24 hours as needed, Vertigo: 25-100 mg daily, in divided doses

### Proprietary Preparations

**Acliz** (*Aristo*), Tab., 50 mg, Tk. 2.50/Tab.

**Anosea** (*Ibn Sina*), Tab., 50 mg, Tk. 2.60/Tab.

**Avert** (*Biopharma*), Tab., 50 mg, Tk. 2.51/Tab.

**Emenil** (*Incepta*), Tab., 50 mg, Tk. 2.50/Tab.

**Emezin** (*Eskayef*), Tab., 50 mg, Tk. 2.50/Tab.

**Melizin** (*Pacific*), Tab., 50 mg, Tk. 1.88/Tab.

**Nomosic** (*Drug Int*), Tab., 50 mg, Tk.2.50/Tab.

**Vomec** (*Beximco*),Tab., 50 mg, Tk. 2.50/Tab.

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### METOCLOPRAMIDE HCl<sup>[E,D]</sup>

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(see also section 2.2)

**Indications:** nausea and vomiting in acute migraine attack, gastrointestinal disorders, adjunct for treatment with cytotoxic drugs or radiotherapy

**Cautions:** hepatic and renal impairment; elderly, young adults, and children; may mask underlying disorders such as cerebral irritation; avoid for 3-4 days following gastro-intestinal surgery, may cause acute hypertensive response in phaeochromocytoma; pregnancy and breast-feeding

**Interactions:** see Appendix-2

## 7. CENTRAL NERVOUS SYSTEM

**Side-effects:** extrapyramidal effects, hyperprolactinaemia, occasionally tardive dyskinesia on prolonged administration; drowsiness, restlessness, diarrhoea, depression, neuroleptic malignant syndrome, cardiac conduction abnormalities reported following intravenous administration

**Dose:** *by mouth* 10 mg 3 times daily. CHILD up to 1 year, 1 mg twice daily; 1-3 years 2 mg 2-3 times daily, 5-9 years 2.5 mg 3 times daily, 9-14 years 5 mg 3 times daily

### Proprietary Preparations

**Metocol** (*Opsonin*), Syrup, 5 mg/5 ml, Tk. 11.90/100 ml

**Migen** (*Albion*), Syrup, 5 mg/5 ml, Tk. 13.70/100 ml

**Meclid** (*Jayson*), Inj., 10 mg/2 ml, Tk. 3.55/2 ml Amp.

**Motilon** (*Sanofi*), Inj., 10 mg/2 ml, Tk. 3.76/2ml Amp.; Paed. drops, 1 mg/ml, Tk. 9.80/15 ml; Syrup, 5 mg/5 ml, Tk. 15.83/100 ml; Tab., 10 mg, Tk. 0.34/Tab.

**Nutramid** (*Acme*), Tab., 10 mg, Tk. 0.34/Tab.; Syrup, 5 mg/5 ml, Tk. 10.65/60 ml

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## ONDANSETRON

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**Indications:** *see under dose*

**Cautions:** pregnancy and breast-feeding; moderate or severe hepatic impairment

**Interactions:** *see Appendix-2*

**Side-effects:** constipation, headache, sensation of warmth or flushing, hiccups; occasional alterations in liver enzymes; occasional transient visual disturbances and dizziness following intravenous administration; involuntary movements, chest pain, arrhythmias, hypotension and bradycardia

**Dose:** moderately emetogenic chemotherapy or radiotherapy, *by mouth*, 8 mg 1-2 hours before treatment or by rectum, 16 mg 1-2 hours before treatment or by intramuscular injection or slow intravenous injection, 8mg immediately before treatment then by mouth, 8mg every 12 hours for up to 5 days or by rectum, 16 mg daily for up to 5 days

Severely emetogenic chemotherapy, *by intramuscular injection or slow intraven-*

*ous injection*, 8mg immediately before treatment, where necessary followed by 8 mg at intervals of 2-4 hours for 2 further doses (or followed by 1 mg/hour by continuous intravenous infusion for up to 24 hours) then by mouth, 8 mg every 12 hours for up to 5 days or by rectum, 16mg daily for up to 5 days alternatively, by intravenous infusion over at least 15 minutes, 32 mg immediately before treatment or by rectum, 16 mg 1-2 hours before treatment then by mouth, 8 mg every 12 hours for up to 5 days or by rectum, 16mg daily for up to 5 days

**Note.** Efficacy may be enhanced by addition of a single dose of dexamethasone sodium phosphate 20mg by intravenous injection.

CHILD, *by slow intravenous injection or by intravenous infusion over 15 minutes*, 5mg/ml immediately before chemotherapy then, 4mg by mouth every 12 hours for up to 5 days

Prevention of postoperative nausea and vomiting, by mouth, 16mg 1 hours before anaesthesia or 8 mg at intervals of 8 hours for 2 further doses.

Alternatively, *by intramuscular or slow intravenous injection*, 4 mg at induction of anaesthesia;

CHILD over 2 years, by slow intravenous injection, 100 micrograms/kg (max. 4 mg) before, during, or after induction of anaesthesia.

Treatment of postoperative nausea and vomiting, by intramuscular or slow intravenous injection, 4 mg; CHILD over 2 years, by slow intravenous injection, 100 micrograms/kg (max. 4 mg)

### Proprietary Preparations

**Anset** (*Opsonin*), Supp., 16 mg, Tk. 11.28/Supp.; Tab., 4 mg, Tk. 3.40/Tab.; Tab., 8 mg, Tk. 7.55/Tab. Inj., 2 mg/ml, Tk. 22.56/Amp.

Syrup, 4 mg/5 ml, Tk. 33.83/50 ml

**Avona** (*Popular*), Syrup, 4 mg/5 ml, Tk. 35.00/50 ml.; Cap., 8 mg, Tk. 10.00/Cap., 4 mg, Tk. 4.00/Cap.; Inj., 8 mg/4 ml, Tk. 30.00/Amp;

**Emeren** (*Renata*), Tab., 4 mg, Tk. 6.00/Tab.; 8 mg, Tk. 10.00/Tab.; Inj., 8 mg/4 ml, Tk. 30.00/Amp.

## 7. CENTRAL NERVOUS SYSTEM

**Emistat (Healthcare)**, Inj., 8 mg/4 ml, Tk. 30.00/Amp.; Tab., 4 mg, Tk. 6.00/Tab.; 4 mg/5 ml, Tk. 45.00/50 ml; Tab., 8 mg, Tk. 10.00/Tab.

**Emiston (Ibn Sina)**, Inj., 8 mg/4 ml, Tk. 25.00/Amp.; Syrup, 4 mg/5 ml, Tk. 35.00/50 ml; Tab., 8 mg, Tk. 10.00/Tab.

**Leofran (Leon)**, Inj, 4 mg/2 ml, Tk. 25.00/Amp.; Tab., 8 mg, Tk. 10.00/Tab.; oral Solution, 4 mg/5 ml, Tk. 45.00/50 ml

**Ofran (Square)**, Inj., 8 mg/4 ml, Tk. 30.00/Amp.; Syrup, 4 mg/5 ml, Tk. 40.00/50 ml; Supp, 16 mg, Tk. 20.00/Supp.; Tab., 8 mg, Tk. 10.04/Tab.

**Onaseron (Incepta)**, Inj., , Tk. 25.00/Amp.; ODT , 4 mg, Tk. 5.00/Tab.; 8 mg, Tk. 10.00/Tab.; Syrup., 4 mg/5 ml, Tk. 40.00/50 ml

**Onasia (Orion)**, Inj, 2 mg/ ml, Tk. 25.00/Amp.; Syrup., 4 mg/5 ml, Tk. 45.00/50 ml; Tab., 8 mg, Tk. 5.00/Tab.

**Oncodex (Jayson)**, Tab., 4 mg, Tk. 4.52/Tab.; Tab., 8 mg, Tk. 8.03/Tab.; Inj., 8 mg/4 ml, Tk. 25.10/Amp.

**Ondamax (Somatec)**, Tab., 4 mg, Tk. 5.00/Tab.; Tab., 8 mg, Tk. 10.00/Tab.; Syrup., 4 mg/5 ml, Tk. 40.00/50 ml

**Ondantor (Novartis)**, Tab., 8 mg, Tk. 12.00/Tab.

**Ondaron (General)**, Inj., 8 mg/4 ml, Tk. 30.00/Amp.

**Ondason (Drug Int.)**, Syrup, 4 mg/ 5 ml, Tk. 40.00/50 ml; Inj., 2 mg/ml, Tk. 30.00/Amp.; Tab., 8 mg, Tk. 10.00/Tab.

**Onsat (Beximco)**, Inj., 8 mg/4 ml, Tk. 25.00/Amp.; oral Soluble Film, 4 mg , Tk. 12.00/Pcs.; oral Soluble Film, 8 mg, Tk. 18.00/Pcs ; Tab., 8 mg, Tk. 10.00/Tab.

**Osetron (ACI)**, Inj., 2 mg/ ml , Tk. 25.09/Amp.; Syrup, 4 mg/5 ml, Tk. 30.11/50 ml.; Tab., 8 mg , Tk. 10.04/Tab.

**Periset (Acme)**, Inj., 8 mg/4 ml, Tk. 30.00/Amp. Syrup, 4 mg/5 ml, Tk. 40.00/50 ml.; Tab., 8 mg , Tk. 10.00/Tab.

**Seton (Delta)**, Tab., 8 mg, Tk. 8.00/Tab.

**Vomiset (RAK)**, Tab., 8 mg, Tk. 10.0/Tab.; Syrup, 4 mg/5 ml, Tk. 30.0/50 ml

**Zofer MD (Sun)**, Tab., 4 mg, Tk. 5.50/Tab.

**Zofra (Eskayef)**, Syrup, 4 mg/5 ml, Tk. 40.00/50 ml ; Inj., Tk. 30.00/Amp. ODT, 4 mg, Tk. 5.00/Tab.; ODT , 8 mg, Tk. 10.00/Tab.

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### PALONOSETRON

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**Indications:** nausea and vomiting caused by cancer chemotherapy.

**Cautions:** pregnancy, breast feeding, driving

**Side-effects:** constipation, headache, pain, swelling, tiredness, severe allergic reactions, unusual muscle movement.

**Dose:** ORAL: 0.5 mg orally administered approximately 1 hour Parenteral: 0.25 mg IV as a single dose 30 minutes before the start of chemotherapy.

### Proprietary Preparations

**Hexinor (Beacon)**, Tab., 2 mg, Tk. 5/Tab.

**Parkinfen (Unimed)**, Tab. 2 mg, Tk. 5/Tab.; 5mg, Tk. 12/Tab.

**Trihexy (Incepta)**, Tab. 2 mg, Tk. 5/Tab.; 5mg, Tk. 16.67/Tab.

**Paloron (Ziska)**, Inj., 0.075mg/1.5ml, Tk. 75.00/1.5ml Vial; 0.25mg/5ml, Tk. 100.00/5ml Vial; Tab., 0.50mg, Tk. 15.00/Tab.

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### PROCHLORPERAZINE

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(see also section 7.2)

**Indications:** severe nausea and vomiting; for other indications, see section 7.2

**Cautions, Contraindications and Side-effects:** see section 7.2 on psychiatric drugs

**Interactions:** see Appendix-2

**Dose:** 2-4 mg daily in divided doses; max. 6 mg daily. CHILD 3-5 years up to 1 mg daily, 6-12 years up to 4 mg daily

### Proprietary Preparations

see section 7.2

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### PROMETHAZINE HCl<sup>[ED]</sup>

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**Indications:** nausea, vomiting, vertigo, labyrinthine disorders, motion sickness; For other indications: see section. 4.7.1

**Cautions, Contraindications & Side-effects:** see section 4.7.1

**Interactions:** see Appendix-2

**Dose :** 20-25 mg twice daily; CHILD under 2 years not recommended, 2-5 years 5 mg twice daily, 5-10 years 10 mg twice daily

### Proprietary Preparations

see section 12.5

## 7. CENTRAL NERVOUS SYSTEM

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### PROMETHAZINE THEOCLATE

---

**Indications:** nausea, vomiting vertigo, labyrinthine disorders, motion sickness (action longer than of promethazine hydrochloride)

**Cautions; Contraindications & Side-effects:** see section 4.7.1 under promethazine hydrochloride.

**Interactions:** see Appendix-2

**Dose:** 25-75 mg, max. 100 mg daily; CHILD 5-10 years, half adult dose.

Prevention of Motion Sickness: 25 mg at bedtime on night before traveling. CHILD 5-10 years, half adult dose

For vomiting in pregnancy, 25 mg increased if necessary to a max. of 100 mg daily

**Proprietary Preparation**

**Avomine** (Sanofi), Tab., 25 mg, Tk. 0.57/Tab.

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### TRIFLUOPERAZINE

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(see also section 7.2)

**Indications:** severe nausea and vomiting; for other indications, see section 7.2

**Cautions, Contraindications; Side-effects:** see section 7.2; extrapyramidal symptoms (EPS) may occur particularly in children and elderly

**Interactions:** see Appendix-2

**Dose:** 2-4 mg daily in divided doses or as a single dose. CHILD, 3-5 years up to 1 mg daily; 6-12 years, up to 4 mg daily

**Proprietary Preparations**

see section 7.2

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## 7.9 DRUGS USED IN THE TREATMENT OF OBESITY

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Obesity is a most common nutritional disorder in affluent societies. Obesity may be defined as a condition in which there is excessive amount of body fat. This condition is most prevalent in middle age, but can occur at any earlier stage of life. The use of **steroids, oral contraceptives, phenothiazines** and **insulin** is commonly followed by weight

gain due to stimulation of appetite. Whatever the ultimate cause of obesity, weight reduction can be achieved only by restricting diets and increasing physical activities. Although there is no substitute for dietary regimen, a limited use as an adjunct in carefully selected patients may be useful in refractory obesity.

The most useful group of drugs at present to support a weight reducing regime acting as appetite suppressants are **phentarsine** and centrally acting **fluoxetine**. Anti-obesity drugs acting on the gastro-intestinal tract are **methylcellulose** and **orlistat** (a pancreatic lipase inhibitor which reduces the absorption of fat).

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### FLUOXETINE

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**Indications:** see notes above

**Interactions:** see Appendix-2

**Side-effects:** drowsiness

**Dose:** bulimia nervosa, 60 mg daily, CHILD not recommended

**Proprietary Preparations**

**Fluoxetine** (Albion), Cap., 20mg, Tk. 2.58/Cap.

**Modipran** (Beximco) Cap., 20mg, Tk. 2.89/Cap.

**Nodep** (General), Cap., 20 mg, Tk. 2.80/Cap.

**Nodepress** (Kemiko), Cap., 20 mg, Tk. 2.60/Cap.

**Prodep** (Sun), Cap., 20 mg, Tk. 3.00/Cap.

**Prolert** (Square), Cap., 20 mg, Tk. 3.00/Cap.

**Seren** (Sonear), Cap., 20 mg, Tk. 2.87/Cap.

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### METHYLCELLULOSE

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**Indications:** adjunct in obesity, ulcerative colitis, constipation

**Contraindications:** colectomy

**Interactions:** see Appendix-2

**Side-effects:** skin rash, itching

**Dose:** adjunct in obesity, 800-1200 mg to be taken with at least 300 ml warm liquid half an hour before each meal or when hungry.

Constipation, 800-1600 mg to be taken in divided doses with at least 300 ml of water or liquid

## 7. CENTRAL NERVOUS SYSTEM

### **Generic Preparation**

Tab. Methyl Cellulose 400mg+Micro  
Crystalline 220mg

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### **ORLISTAT**

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**Indications:** see notes above

**Cautions:** diabetes mellitus; may impair absorption of fat-soluble vitamins (multi-vitamin supplement, when needed should be taken at least 2 hours after orlistat dose or at bedtime).

**Contraindications:** chronic malabsorption syndrome; cholestasis, pregnancy and breast-feeding.

**Interactions:** see Appendix-2

**Side-effects:** liquid oily stool, flatulence, increased defecation and fecal incontinence

**Dose:** 120mg with each main meal, up to max. 360 mg daily. CHILD not recommended.

### **Proprietary Preparations**

**Adiponil** (*Incepta*), Cap., 120 mg, Tk. 40/Cap.

**Dietil** (*Eskayef*), Cap., 120 mg, Tk. 40/Cap.

**Olistat** (*Square*), Cap., 120 mg, Tk. 60/Cap.

**Slimfast** (*Healthcare*), Cap., 120mg, Tk. 50/Cap

**Slimi** (*Unimed*), Cap., 60 mg, Tk. 30/Cap.

**Xenekal** (*Radiant*), Cap., 120 mg, Tk. 60/Cap.

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### **7.10 DRUGS USED FOR DEMENTIA**

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Dementia is defined as a clinical syndrome characterized by a loss of previously acquired intellectual function in the absence of impairment consciousness. The commonest causes are Alzheimer's disease and cerebrovascular disease. Dementia is predominantly associated with the elderly.

Drugs should be avoided in demented patients unless there are specific indications.

**Cautions:** Dementia patients are highly sensitive to sedative drugs. If medication is needed to treat episodes of confusion or excitement, **Thioridazine** 25 mg 8 hourly can be given (see section 7.2).

Among psychiatric patients, the most significant disorder is the amnesic syndrome caused by thiamine

deficiency. In such cases, immediate treatment with **thiamine** 50 mg intravenously daily should be given to minimize the damage (see section 16.2.3.2).

Anticholinesterase inhibitors some-times improve cognitive functions. **Donepezil galantamine** and **rivastigmine**, both reversible acetylcholinesterase inhibitors have recently been introduced to treat dementia in Alzheimer's disease.

**Citicoline** is an intermediate in the generation of phosphatidylcholine from choline; it is used for Alzheimer's disease and other types of dementia

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### **ALMITRIN BISMESYLATE WITH RABASINE**

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**Indications:** cerebral insufficiency characterized by intellectual impairment (disorders of memory, concentration, etc). Auditory, vestibular and visual disorders of ischemic etiology. Used in functional rehabilitation after cerebrovascular accidents

**Contraindications:** in combination with MAOIS

**Cautions:** pregnancy; avoid concomitant use of other drug containing Almitrin

**Side-effects:** sleep disturbances, palpitations, anxiety, dizziness.

### **Proprietary Preparations**

**Almitrine Bismesylate 30 mg with Raubasine 10 mg Tab.**

**Albasine** (*Drug Int.*), Tab., Tk. 12.00/Tab.

**Truxil** (*Square*), Tab., Tk. 10.00/Tab.

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### **CITICOLINE**

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**Indications:** Alzheimer's disease head trauma, stroke, age-related memory loss, attention deficit hyperactive disorder

**Side effects:** insomnia, headache, diarrhea, nausea, blurred vision, chest pains

**Dose:** ELDERLY :1000-2000 mg per day for dementia

### **Proprietary Preparation**

**Citicol** (*Beximco*), IV/IM inj, 500 mg/4 ml, Tk. 140.00/Vial

## 7. CENTRAL NERVOUS SYSTEM

### DONEPEZIL HYDROCHLORIDE

**Indications:** mild to moderate dementia in Alzheimer's disease

**Cautions:** sick sinus syndrome or other supraventricular conduction abnormalities; patients at risk of developing peptic ulcers; asthma, obstructive airway disease

**Contraindications:** pregnancy and breast-feeding

**Interactions:** see Appendix-2

**Side-effects:** nausea, vomiting, diarrhea, fatigue, insomnia, muscle cramps, less frequently headache, dizziness, syncope, bradycardia, rarely sinoatrial block, AV block, and convulsions; increase in plasma creatine kinase concentration; anorexia, gastric and duodenal ulcers, gastro-intestinal haemorrhage, psychiatric disturbances and hepatitis reported; potential for bladder outflow obstruction

**Dose:** 5 mg once daily at bed time, increase if necessary after one month to 10 mg daily; max. 10 mg daily

#### Proprietary Preparations

**Ameloss** (*Incepta*), Tab., 5mg, Tk. 10/Tab.

**Elizer** (*Square*), Tab., 5 mg, Tk. 10.04/Tab.

### GALANTAMINE

**Indications:** mild to moderate vascular dementia and Alzheimer's disease

**Cautions:** Parkinson's disease, severe asthma,

**Contraindications:** renal and hepatic pregnancy,

**Side effects:** nausea, anorexia, dizziness, headache, tremor, fatigue, irritation and insomnia

#### Proprietary Preparation

**Antial** (*ACI*), Tab., 8mg, Tk. 20.08/Tab.; 4mg, Tk. 12.05/Tab.

### RIVASTIGMINE

**Indications:** mild to moderate dementia in Alzheimer's disease

**Cautions:** renal impairment, mild to moderate hepatic impairment (see Appendix-3); sick sinus syndrome, conduction abnormalities; gastric or duodenal ulcers (and those at risk of developing ulcers); history of asthma or chronic obstructive pulmonary disease; pregnancy (Appendix-5); monitor body-weight

**Contraindications:** breast-feeding

**Interactions:** see Appendix-2

**Side-effects:** asthenia, anorexia, weight loss, dizziness, nausea, vomiting, drowsiness, abdominal pain, agitation and confusion, depression, diarrhoea, dyspepsia, headache, insomnia, sweating, malaise, tremor rarely angina pectoris, gastrointestinal hemorrhage, syncope; potential for causing bladder outflow obstruction; convulsions

**Note:** Gastro-intestinal side-effects may occur more commonly in women

**Dose:** initially 1.5 mg twice daily, increased in steps of 1.5 mg twice daily at intervals of at least 2 weeks according to response and tolerance; usual range 3-6 mg twice daily; max. 6 mg twice daily

#### Proprietary Preparations

**Demelon** (*Unimed*), Cap., 1.5 mg, Tk. 20.00/Cap.; 3 mg, Tk. 40.00/Cap.

**Exelon Patch 10<sup>0</sup>** (*LTS Lohmann*), Transdermal Patch, 9.5 mg/24h, Tk. 224.00/Patch

**Exelon Patch 5<sup>0</sup>** (*LTS Lohmann*), Transdermal Patch, 4.6 mg/24h, Tk. 224.00/Patch

**Exelon<sup>0</sup>** (*Novartis*), Cap., 1.5 mg, Tk. 122.00/Cap.; 3 mg, Tk. 122.00/Cap.; 4.5 mg, Tk. 122.00/Cap.; 6 mg, Tk. 122.00/Cap.

**Rivamer** (*Sun*), Cap., 1.5 mg, Tk. 20.00/Cap.; 4.5 mg, Tk. 40.00/Cap.

**Rivascot** (*Albion*), Cap. 1.5 mg, Tk. 14.10/Cap.

**Rivastigmin<sup>0</sup>** (*Pharmathen*), Cap., 1.5 mg, Tk. 22.79/Cap.; 3 mg, Tk. 37.65/Cap.; 4.5 mg, Tk. 51.69/Cap.; 6 mg, Tk. 65.72/Cap.