

Chapter 2

GASTRO-INTESTINAL SYSTEM

- 2.1 Drugs for Dyspepsia and gastrooesophageal reflux** p.100
 - 2.1.1 Aluminium and magnesium containing antacids p.102
 - 2.1.2 Compound antacid preparations p.103
- 2.2 Antispasmodics and other drugs altering gut motility** p.104
- 2.3 Ulcer-healing drugs** p.110
 - 2.3.1 H₂ receptor antagonists p.111
 - 2.3.2 Selective antimuscarinics p.114
 - 2.3.3 Proton pump inhibitors p.114
 - 2.3.4 Chelates and complexes p.120
 - 2.3.5 Prostaglandin analogues p.120
 - 2.3.6 Drugs for eradication of *H. pylori* p.121
- 2.4 Drugs for acute diarrhoea** p.122
- 2.5 Drugs for chronic diarrhoeas** p.124
- 2.6 Laxatives** p.126
 - 2.6.1 Bulk forming laxatives p.126
 - 2.6.2 Stimulant laxatives p.127
 - 2.6.3 Faecal softeners p.128
 - 2.6.4 Osmotic laxatives p.128
- 2.7 Preparations for haemorrhoids** p.130
 - 2.7.1 Soothing haemorrhoidal preparations p.130
 - 2.7.2 Compound haemorrhoidal preparations with corticosteroids p.131
 - 2.7.3 Rectal sclerosants p.131
- 2.8 Drugs affecting intestinal secretions** p.131
 - 2.8.1 Drugs acting on gall bladder p.131
 - 2.8.2 Pancreatin p.132

2.1 DRUGS FOR DISPEPSIA AND GASTRO-OESOPHEGAL REFLUX

Dyspepsia

Dyspepsia is associated upper abdominal pain, fullness, early satiety, bloating, and nausea. It can also occur with gastric and duodenal ulceration and gastric cancer. However, most commonly the cause and origin are uncertain. Dyspepsia associated with bleeding, dysphagia, recurrent vomiting, or weight loss needs urgent endoscopic investigation. Sometimes some medicines or patient's life style may cause dyspepsia.

Antacid provides some symptomatic relief of dyspepsia. However, if symptoms persist in uninvestigated dyspepsia, treatment involves a proton pump inhibitor for up to 4 weeks. If patient do not respond to a proton pump inhibitor, should be tested for *Helicobacter pylori* (*H. pylori*) and given eradication therapy (section 2.3.6) if *H. pylori* test is positive.

H. pylori positive patients with functional (investigated, non-ulcer) dyspepsia, should be treated with eradication therapy. If symptoms persist, treatment with either a proton pump inhibitor (section 2.3.3) or H₂-receptor antagonist (section 2.3.1) can be given for 4 weeks. These antisecretory drugs can be used

2. GASTRO-INTESTINAL SYSTEM

intermittently to control symptoms long term. However, most patients with functional dyspepsia do not benefit symptomatically from *H. pylori* eradication therapy or antisecretory drugs.

Gastro-oesophageal reflux disease

Gastro-oesophageal reflux disease (both non-erosive and erosive) is associated with heartburn, acid regurgitation, and sometimes, difficulty in swallowing (dysphagia). Oesophagitis, ulceration, and stricture formation may occur with associated asthma.

The management of gastro-oesophageal reflux disease includes drug treatment, lifestyle changes and, in some cases, surgery. Initial treatment is guided by the severity of symptoms and treatment is then adjusted according to response. The extent of healing depends on the severity of the disease, the treatment chosen, and the duration of therapy.

Patient with gastro-oesophageal reflux disease is treated with drugs. However, patient should be advised to change lifestyle such as cessation of smoking and alcohol, avoidance of fatty foods; other measures include weight reduction and raising the head of the bed. In some cases surgery may be required.

Patient with gastro-oesophageal reflux with mild symptoms may be managed by the use of antacids and alginates. Histamine H₂-receptor antagonists (*section 2.3.1*) may also relieve symptoms, but proton pump inhibitors (*section 2.3.3*) provide more effective relief of symptoms than H₂-receptor antagonists. When symptoms subside, treatment is titrated down to a level which maintains remission (e.g. by giving treatment intermittently).

Patient with gastro-oesophageal reflux with severe symptoms or patient with a proven or severe pathology (e.g. oesophagitis, oesophageal ulceration, oesophagopharyngeal reflux, Barrett's oesophagus) may be treated initially by giving a proton pump inhibitor (*section 2.3.3*); However, if symptoms persist despite treatment for 4–6 weeks with a proton pump inhibitor, reassessment should be done. When symptoms abate,

treatment is titrated down to a level which maintains remission (e.g. by reducing the dose of the proton pump inhibitor or by giving it intermittently, or by substituting treatment with a histamine H₂-receptor antagonist).

Patient with endoscopically confirmed erosive, ulcerative, or stricturing disease, or Barrett's oesophagus, treatment with a proton pump inhibitor usually needs to be maintained at the minimum effective dose.

Pregnant woman with gastro-oesophageal reflux is managed by dietary and lifestyle changes; if no improvement of symptoms, an antacid (*section 2.1.1*) or an alginate may be given. If this is ineffective, ranitidine (*section 2.3.1*) may be advised. However, omeprazole (*section 2.3.3*) is reserved for women with severe or complicated reflux disease.

Children with gastro-oesophageal reflux disease is common in infancy. However, most symptoms resolve without treatment between 12 and 18 months of age. Infants with mild or moderate reflux without complications can be managed initially by changing the frequency and volume of feed. A thickened formula feed can be used upon advice of a dietitian. If necessary, a suitable alginate-containing preparation can be used instead of thickened feeds. Older children with reflux may be managed by life-style changes; if necessary by treatment with an alginate containing preparation.

Non-responsive children to the above measures or who have problems such as respiratory disorders or suspected oesophagitis need to be referred to hospital; an H₂-receptor antagonist (*section 2.3.1*) may be tried to reduce acid secretion. If the oesophagitis is resistant to H₂-receptor antagonists, the proton pump inhibitor omeprazole (*section 2.3.3*) can be advised.

Hepatic and renal impairment: Patients with fluid retention should avoid antacids containing large amounts of sodium.

Interactions: Antacids should preferably not be taken at the same time as other drugs since they may impair absorption.

2. GASTRO-INTESTINAL SYSTEM

It may also damage enteric coatings designed to prevent dissolution in the stomach.

2.1.1 ALUMINIUM-AND MAGNESIUM-CONTAINING ANTACIDS

2.1.2 COMPOUND ANTACID PREPARATIONS

Antacids are basic compounds, which neutralize hydrochloric acid in the gastric secretions; they often relieve symptoms of gastrointestinal disorders associated with gastric hyperacidity such as ulcer dyspepsia, non-erosive gastro-oesophageal reflux disease and peptic ulcer. Antacids, sometimes also used in functional (non-ulcer) dyspepsia but the evidence of benefit is uncertain. They are best given usually between meals and at bedtime when symptoms occur or are expected. Liquid preparations are more effective than solids and relatively insoluble antacids are longer acting. Presence of foods in the stomach can prolong the neutralizing activity. Antacids may interact with many other drugs affecting the rate and extent of their absorption (see Appendix-2). For this reason, antacids should preferably not be taken at the same time with other drugs.

2.1.1 ALUMINIUM AND MAGNESIUM CONTAINING ANTACIDS

Salts of Aluminium (**Aluminium hydroxide gel**) and Magnesium (**Magnesium hydroxide, Magnesium trisilicate and Magnesium carbonate**), being relatively insoluble in water, are long-acting and are suitable for use as antacid. Magnesium-containing antacids tend to cause diarrhoea and aluminium salts cause constipation; so mixtures of these two preserve normal bowel function. Some of these preparations contain high concentration of sodium and should not be given to patients on sodium restricted diet.

PREPARATIONS CONTAINING MIXTURES OF ALUMINIUM HYDROXIDE AND MAGNESIUM HYDROXIDE^[ED]

Proprietary Preparations

Alimag (*Asiatic*), Tab. Tk. 0.52/Tab.
Alucil-S (*Opsonin*), Susp.Tk. 56.39/200 ml
Tab.Tk. 1.50/Tab.
Antacid (*Popular*), Tab. Tk. 0.53/Tab.
Antameal (*Alco*), Tab. Tk. 0.50/Tab.
Antanil (*Ibn Sina*), Susp.Tk. 33.00/200 ml
Tab. Tk. 0.52/Tab.
Apocid (*Supreme*), Tab. Tk. 0.50/Tab.
Apedrox (*APC*), Susp. Tk. 30.00/200 ml
Biocid (*Biopharma*), Tab. Tk. 0.50/Tab.
Biocid MH (*Biopharma*), Susp.Tk.32.42/200 ml
Cytocid (*Central*), Susp. Tk. 32.00/200 ml
Entacyd (*Square*), Susp. Tk. 55.00/200 ml
Tab. Tk. 0.80/Tab.
G-Antacid MH (*Gonoshasthaya*), Tab.
Tk.0.53/Tab
Gascon (*Popular*), Tab. Tk. 1.20/Tab.
Jpdrox (*Jayson*), Susp. Tk. 57.00/200 ml;
Tab. Tk. 0.73/Tab.
Lactameal (*Beximco*), Tab. Tk. 0.53/Tab.;
Susp. Tk. 33.00/200 ml
Magnogel (*Amico*), Tab. Tk. 0.52/Tab.;
Tk.32.00/200 ml
Oxecone (*Acme*), Susp.Tk. 57.33/200 ml;
Tab. Tk. 0.73/Tab.
Sugel (*Pacific*), Susp. Tk. 24.06/200 ml; Tab.
Tk. 0.38/Tab.

MAGNESIUM TRISILICATE

Indications: used as an antacid in dose upto 2 g by mouth; usually in combination with aluminium-containing antacids

Cautions: see notes above; patients with impaired renal functions

Contraindications: see notes above

Interactions: see Appendix-2

Side-effects: diarrhoea

Mixtures of 250mg of Dried Aluminium Hydroxide Gel and 500mg of Magnesium Trisilicate
G-Antacid (*Gonoshasthaya*), Susp.
Tk.32.00/200ml; Tab. Tk. 0.53/Tab.

2. GASTRO-INTESTINAL SYSTEM

2.1.2 COMPOUND ANTACID, SIMETHICONE AND ALGINATE PREPARATIONS

Compound preparations have no clear advantages over simpler preparations; their neutralising capacity may be the same. Complexes containing both aluminium and magnesium such as **magaldrate**, **hydrotalcite** and **almasilate** have been used.

MAGALDRATE

Magaldrate (Aluminium Magnesium Hydroxide Sulfate) is a synthetic combination of aluminium and magnesium hydroxides and sulphates. It reacts initially rapidly with acid and releases aluminium hydroxide, which then reacts more slowly to provide sustained neutralizing action. Magaldrate may be given in doses of up to 2 g by mouth.

Proprietary Preparations

Magacil (*Opsonin*), Tab., 400 mg, Tk. 0.75/Tab.; Susp., 400 mg/5 ml, Tk. 37.74/200ml

Magaplus (*Kemiko*), Susp., 400 mg/5 ml, Tk. 54.20/200 ml

Marlox (*Incepta*), Tab., 400 mg, Tk. 1.00/Tab.

Oxecone-M (*Acme*), Tab. 400 mg, Tk. 1/Tab.; Susp., 400 mg/5 ml, Tk. 54.20/200 ml

Magaldrate 480mg + Simethicone20mg/Tab

Magaldrate 480mg + Simethicone20mg/5ml suspension

Avlocid MS (*ACI*), Tab., , Tk. 3.00/Tab.;

Susp., Tk. 100.00/200 ml

Digecid Plus (*Beximco*), Tk. 2.00/Tab.; Susp., Tk. 110.00/200 ml

Gastid (*Eskayef*), Tab., Tk. 3.00/Tab.; Susp., Tk. 100.00/200 ml

Magacil Plus (*Opsonin*), Susp.Tk.75.19/200ml

Magalrat Plus (*Ibn Sina*), Tab., Tk. 3.00/Tab.; Susp., Tk. 100.00/200 ml

Maganta Plus (*Square*), Tab., Tk. 3.00/Tab.; Susp., Tk. 100.00/200 ml

Magaplus-X (*Kemiko*),Susp.Tk. 55.00/100 ml; Tk. 100.00/200 ml

Marlox Plus (*Incepta*), Tab.Tk. 3.00/Tab.; Susp., Tk. 100.00/200 ml

Novelta (*Orion*), Tab. Tk. 3.00/Tab.; Tk. 65.00/100 ml; Tk. 100.00/200 ml

Oxecone-MS (*Acme*), Susp.Tk.100.00/200 ml

ALUMINIUM -AND MAGNESIUM- CONTAINING ANTACIDS WITH ADDITIONAL INGREDIENTS

Simethicone which acts as a defoaming agent has been combined with an antacid formulation to relieve flatulence.

ALGINATES

Alginate an anionic polysaccharide is obtained from brown algae. Alginates containing antacids form a viscous gel (raft) that floats on the surface of stomach contents which impedes reflux and protects oesophageal mucosa from acid attack. Compound antacid preparations contain alginic acid or sodium alginates with sodium bicarbonate/potassium bicarbonate, calcium carbonate. Some compounds preparations also contain alginate/alginic acid with dried aluminium hydroxide, magnesium trisilicate and sodium bicarbonate

Proprietary Preparations

Sodium Alginate + Potassium Bicarbonate

Algicid (*Incepta*), Susp., 500 mg + 100 mg /5ml, Tk. 125.00/200 ml ;Tab. , 500 mg + 100 mg, Tk. 3.50/Tab.

Algicon (*Leon*), Tab. , 500 mg + 100 mg, Tk. 3.00/Tab. ;Susp., 500 mg + 100 mg /5ml,Tk. 125.00/200 ml

Asynta (*Square*), Susp., 500 mg + 100 mg/5 ml, Tk. 125.00/200 ml

Gastrocon (*Unimed*), Tab., 500 mg + 100 mg, Tk. 4.50/Tab.;Susp., 500mg + 100 mg/5 ml, Tk. 155.00/200 ml

Viscoccid (*Beximco*), Susp. 500 mg+100 mg /5ml, Tk. 150.00/200 ml

SIMETHICONE

(Activated Dimethicone)

Simethicone which is also known as Activated Dimethicone has been used for the relief of the painful symptoms of excess gas in the digestive tract. Such gas is frequently caused by excessive swallowing of air while eating foods that disagree, and this may also lead to indigestion. It has also been used in infantile colic but evidence of benefit is uncertain.

2. GASTRO-INTESTINAL SYSTEM

Simethicone acts in the stomach and intestine by changing the surface tension of gas bubbles, enabling them to coalesce; thus gas is freed and eliminated more easily by belching or passing flatus.

Indications: flatulence, Abdominal distension, gas and windy colic. Simethicone drops are particularly indicated in infantile colic

Cautions; Contraindications; Side-effects: simethicone is an inert substance and no adverse effects have been reported after oral administration

Proprietary Preparations

Aeropac (*Amico*), Paed. drops, 67 mg/ml, Tk. 25.00/15 ml
Bloatstop (*Acme*), Emulsion, 1 gm/100 ml, Tk. 70.00/100 ml
Flacol (*Square*), Paed. drops, 67 mg/ml., Tk. 30.11/15 ml ;Tab. , 40mg, Tk. 1.50/Tab.
Flatulex (*Opsonin*), Paed. drops, 67 mg/ml., 67 mg/ml, Tk. 22.64/15 ml
Flatunil (*Acme*), Paed. drops, 67 mg/ml, 67 mg/ml, Tk. 30.00/15 ml
Gasnil (*Eskayef*), Paed. drops 67 mg/ml, Tk. 30.00/15 ml
Lefoam (*Incepta*), Paed. drops, 67 mg/ml, Tk. 30.00/15 ml
Neodrop (*Beximco*), Paed. drops, 67 mg/ml, Tk. 30.00/15 ml
Pedicon (*Orion*), Paed. drops, 67 mg/ml, Tk. 25.09/10 ml ;Paed. drops, 67 mg/ml, Tk. 30.11/15 ml
Semecon (*Drug Int.*), Paed. drops, 67 mg/ml, Tk. 35.00/15 ml
Simecol (*Alco*), Paed. drops, 67 mg/ml, Tk. 28.00/15 ml
Simet (*ACI*), Paed. drops, 67 mg/ml, Tk. 30.11/15 ml

Aluminium hydroxide and magnesium hydroxide with simethicone

Antacid MAX (*Beximco*), Tab. Tk. 2/Tab. ;
Antanil Plus (*Ibn Sina*), Susp. Tk. 65/200 ml; Tab., Tk. 1.50/Tab.
Avlocid Plus (*ACI*), Tab. Tk. 2/Tab. ;Susp., Tk. 75/200 ml
Blocid Plus (*Biopharma*), Susp. Tk. 75/200ml; Tab. Tk. 2/Tab.
Entacyd Plus (*Square*), Susp.Tk. 75/200 ml; Tab. Tk. 2.00/Tab.
Flatameal DS (*Beximco*), Susp. Tk. 75/200 ml
Kdrox Plus (*Kemiko*), Tab. Tk. 2/Tab.
Makcid Plus (*Maks*), Susp. Tk. 64/200 ml
Oxecone-S (*Acme*), Susp.Tk. 75/200 ml; Tab., Tk. 2.00/Tab.
Peptacid (*Amico*),Tab.,Tk.1/Tab.;Tk.55/200 ml

Recocid Plus (*Rephco*), Susp., Tk. 75/200 ml; Tab. Tk. 2/Tab.

2.2 ANTISPASMODICS AND OTHER DRUGS ALTERING GUT MOTILITY

Gastrointestinal pain and discomfort may be due to spasm of the smooth muscles which may be associated with dyspepsia irritable bowel syndrome or diverticular disease. Antispasmodic drugs may be useful as adjunctive treatment and are of two types: a) antimuscarinics; and b) direct smooth muscle relaxant.

ANTIMUSCARINICS

(see also section 8.1.3)

The antimuscarinics reduce intestinal spasm, motility and gastric secretions, and may be useful in some forms of dyspepsia, irritable bowel syndrome and diverticular disease. Antimuscarinics used in gastrointestinal muscle spasm include the tertiary amines **Atropine sulphate**, **dicycloverine hydrochloride** and **oxyphenyclimine hydrochloride**. **Trimebutine** is a drug with antimuscarinic and opioid agonist effects. Quaternary ammonium compounds **Hyoscine butylbromide**, **Propantheline bromide**, **oxyphenonium bromide**, and **Tiemonium methylsulphate**.

Dicycloverine hydrochloride has much less antimuscarinic action than atropine and may also have some direct action on smooth muscle. Hyoscine butylbromide is advised as a gastro-intestinal antispasmodic, but it is poorly absorbed.

Quaternary ammonium compounds are less lipid soluble and so are less likely to cross the blood-brain barrier; they are also less well absorbed. Although central atropine like side-effects, such as confusion, are thereby reduced, peripheral atropine-like side-effects still remain common. The elderly are particularly susceptible to glaucoma and urinary retention.

Antimuscarinics are contraindicated in myasthenia gravis (but may be used to decrease muscarinic side-effects of anticholinesterases), pyloric stenosis,

2. GASTRO-INTESTINAL SYSTEM

paralytic ileus, toxic megacolon, and prostatic enlargement. It should be used with caution in children and in the elderly; in Down's syndrome, reflux oesophagitis, diarrhoea, conditions associated with cardiac insufficiency and tachycardia, hypertension, ulcerative colitis, autonomic neuropathy, acute myocardial infarction, pyrexia, individuals susceptible to angle-closure glaucoma.

Side-effects of antimuscarinic drugs (especially with high doses) include constipation, transient bradycardia (followed by tachycardia, palpitations and arrhythmias), reduced bronchial secretions, urinary retention, dilatation of the pupils with loss of accommodation, photophobia, dryness of the mouth and skin, occasional confusion (particularly in the elderly), nausea, vomiting and giddiness.

ATROPINE SULPHATE ^[ED]

Indications: aid in peptic ulcer treatment, gastrointestinal spasm, renal and biliary colic, pre-medication (see sec. 8.1.3)

Cautions; Contraindications; Side-effects: see notes above

Interactions: see Appendix-2

Dose: see section 8.1.3

Proprietary Preparations

Atropine (*Chemist*), Inj., 1mg/ml, Tk. 2.52/1ml Amp

Atropine-Jayson (*Jayson*), Inj. 0.6 mg/1ml, Tk. 5.00/1 ml Amp.

G-Atropine (*Gonoshasthaya*), Inj. 0.6 mg/1ml, Tk. 3.01/1ml Amp.

DICYCLOVERINE HYDROCHLORIDE (Dicyclomine hydrochloride)

Indications: symptomatic relief of gastro-intestinal disorders characterised by smooth muscle spasm

Side effects: see notes above

Cautions: see notes above

Contra-indications: see notes above; also infants under 6 months

Pregnancy: not known to be harmful; use only if essential

Breast-feeding: should be avoided, present in milk; apnoea reported in infant
Dose: 10–20 mg 3 times daily; INFANT 6–24 months 5–10mg 3–4 times daily, 15 minutes before feeds; CHILD 2–12 years 10mg 3 times daily

Proprietary Preparations

Abdorin (*Opsonin*), Tab., 10 mg, Tk.

1.51/Tab.; Syrup, 10 mg/5 ml, Tk. 22.64/50 ml

Colicon (*Square*), Tab., 10 mg, Tk. 2.01/Tab.

Inj., 20 mg/2 ml, Tk. 6.02/Amp.; Syrup, 10

mg/5 ml, Tk. 30.11/50 ml

Cyclopan (*Incepta*), Syrup, 10 mg/5 ml, Tk.

30.00/50 ml; Tab., 10 mg, Tk. 2.00/Tab. Inj.,

20 mg/2 ml, Tk. 8.00/Amp.

Cyclovin (*Somatec*), Tab., 10 mg, Tk.

2.01/Tab.; 10 mg/5 ml, Tk. 30.11/50 ml

Dirin (*Alco*), Tab., 10 mg, Tk. 2.00/Tab.;

Syrup, 10 mg/5 ml, Tk. 40.00/50 ml

Diverin (*ACI*), Syrup, 10mg/5ml, Tk.

30.11/50 ml; Tab., 10mg, Tk. 2.01/Tab. ;Tab.

20mg, Tk. 3.51/Tab.

Eraspa (*MST*), Tab. 10 mg, Tk. 2/Tab.

Ibspa (*Pacific*), Syrup, 10 mg/5 ml, Tk.

18.80/50 ml; Tab., 10 mg, Tk. 1.50/Tab.

Loverin (*Beximco*), Tab., 10 mg, Tk.

2.01/Tab. Syrup, 10 mg/5 ml, Tk. 30.00/50 ml

Spalax (*Navana*), Syrup, 10 mg/5 ml, Tk.

30.11/50 ml

HYOSCINE BUTYLBROMIDE ^[ED]

Indications: symptomatic relief of gastro-intestinal, biliary or genitourinary colic (spasmodic pain) and irritable bowel syndrome; dysmenorrhoea; as antispasmodic in endoscopy and radiological procedures of gut; as an adjunct in the treatment of peptic ulcer

Cautions; Contraindications; Side-effects: see notes above

Interactions: see Appendix-2

Dose: by mouth, 10–20 mg 4 times daily; CHILD 6–12 years, 10 mg 3 times daily.

By intramuscular or intravenous injection (acute spasm), 20 mg, repeated after 30 minutes if necessary. CHILD not recommended

Proprietary Preparations

Altapan (*Albion*), Tab., 10 mg, Tk.1.80/Tab.

Asipan (*Asiatic*), Tab., 20 mg, Tk. 3.00/Tab.

Buscon (*Ibn Sina*), Tab., 10 mg, Tk. 3.44/Tab.;

Inj., 20 mg/ml, Tk. 7.10/Amp.

2. GASTRO-INTESTINAL SYSTEM

Butapan (*Sanofi*), Tab., 10 mg, Tk. 3.42/Tab.; 20 mg, Tk. 6.00/Tab.; Inj., 20 mg/ml, Tk. 7.89/Amp.

Butason (*Hudson*), Tab., 10mg, Tk.1.75/Tab.

Colik (*ACI*), Inj., 20 mg/ml, Tk. 7.88/amp; Tab., 10 mg, Tk. 3.44/Tab.; 20 mg, Tk. 6.70/Tab.

Colipan (*Medimet*), Inj., 1 mg/ml, Tk.7.85/1 ml Amp.; Tab., 10mg, Tk.3.00/Tab.; 20mg, Tk.5.65/Tab.

G-Hyoscine (*Gonoshasthaya*), Tab. 10 mg, Tk.3.35/Tab.; Inj., 20 mg/ml, Tk.7.75/Amp.

Hybucin (*Supreme*), Tab., 10mg, Tk. 3.40/Tab.

Hybut (*Amico*), Tab. 10 mg, Tk. 3.43/Tab.

Hysomide (*Opsonin*), Tab., 10 mg, Tk. 2.58/Tab.; 20 mg, Tk. 2.64/Tab.; Inj., 20 mg/ml, Tk. 5.93/Amp.

Spanil (*Beximco*), Tab., 10 mg, Tk. 3.44/Tab.

Spasmoson (*Jayson*), Tab., 10 mg, Tk. 3.40/Tab.; Inj., 20 mg/ml, Tk. 7.88/Amp.

OXYPHENONIUM BROMIDE

Indications: symptomatic relief of gastro-intestinal, biliary or genitourinary colic; as an adjunct in the treatment of peptic ulcer

Cautions; Contraindications; Side-effects: see notes above

Interactions: see Appendix-2

Dose: by mouth, 5-10 mg 3 times daily

Proprietary Preparations

Antrex (*Opsonin*), Tab., 5 mg, Tk. 0.94/Tab.

Antrenyl (*Novartis*), Tab., 5 mg, Tk. 4.00/Tab.

A-Spasm (*Acme*), Tab., 5 mg, Tk. 1.43/Tab.

Isonil (*Amico*), Tab., 5 mg, Tk. 1.41/Tab.

PROPANTHELINE BROMIDE

Indications: symptomatic relief of gastrointestinal colic, as an adjunct in the treatment of peptic ulcer; adult enuresis and urinary incontinence

Cautions; Contra indications; Side-effects: see notes above

Interactions: see Appendix-2

Dose: 15 mg 3 times daily 1 hour before meals and 30 mg at night, max. 120mg daily. CHILD not recommended

Proprietary Preparation

Prokind (*Beacon*), Tab. 15 mg, Tk. 8.00/Tab.

TIEMONIUM METHYLSULPHATE

Indications: symptomatic relief of gastrointestinal, biliary, renal and genitourinary colic

Cautions; Contraindications; Side-effects: see notes above.

Interactions: see Appendix-2

Dose: by mouth 100-300 mg daily in divided doses; by intramuscular or slow intravenous injection, 10 mg 2-3 times daily

Proprietary Preparations

Algin (*Renata*), Inj., 2.5 mg/ml, Tk. 25/amp.;

Syrup, 200 mg/100 ml, Tk. 90/100 ml; Tab.,

50mg, Tk. 6/Tab

Aspasom (*Kemiko*), Tab., 50 mg, Tk. 5/Tab.

Dysma (*Rangs*), Tab., 50 mg, Tk. 5/Tab.

Emogin (*Somatec*), Tab., 50 mg, Tk. 5.00/Tab.

Emonium (*Beximco*), Inj., 5 mg/2 ml, Tk.

15.00/amp.; Tab., 50 mg, Tk. 5.00/Tab.

Norvis (*Square*), Inj., 5 mg/2 ml, Tk.

15.05/amp.; Syrup, 10 mg/5 ml, Tk. 87/100 ml;

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

Onium (*Orion*), Inj., 5 mg/2 ml, Tk. 15.06/amp.;

Tab., 50 mg, Tk. 5.02/Tab.; Syrup, 10 mg/5 ml,

Tk. 85.00/100 ml ;Tk. 50.00/50 ml

Panium (*Navana*), Tab., 50 mg, Tk.

5.00/Tab.; Inj., 5 mg/2 ml, Tk. 20.00/amp.

Previp (*Genera*), Tab., 50 mg, Tk. 4.02/Tab.

Relvos (*Biopharma*), Inj., 5 mg/2 ml, Tk.

15.00/amp ; Tab., 50 mg, Tk. 5.00/Tab

Spanium (*Ziska*), Inj., 5 mg/2 ml, Tk. 15/2ml

Amp.; 50 mg, Tk. 4/Tab.

Tiemo (*Alco*), Tab., 50 mg, Tk. 4.00/Tab.

Tienum (*Chemist*), Inj., 2 ml, Tk. 15/2 ml

Amp; Tab., 50 mg, Tk. 4/Tab.

Timoben (*Benham*), Tab., 50 mg, Tk. 5/Tab.

Timonac (*RAK*), Inj., 5 mg/2 ml, Tk.

20.00/amp.; Tab., 50 mg, Tk. 6.00/Tab.

Timonil (*Popular*), Tab., 50 mg, Tk.

7.00/Tab. ; Inj., 5 mg/2 ml, Tk. 15.06/amp.

Timothy (*Eskayef*), Inj., 5 mg/2 ml, Tk.

15.00/amp ; Tab., 50 mg, Tk. 4.00/Tab.

Timozin (*Incepta*), Inj., 5 mg/2 ml, Tk.

15.00/amp.; Tab., 50 mg, Tk. 5.00/Tab.

Tinilux (*Sharif*), Tab., 50 mg, Tk. 4.00/Tab.

Tinimet (*Rephco*), Inj., 5 mg/2 ml, Tk. 20/amp.;

5mg/2ml, Tk. 25/amp.; Tab., 50 mg, Tk. 5/Tab.

Tinium (*Acme*), Inj., 5 mg/2 ml, Tk.

20.00/amp.; Tab., 50 mg, Tk. 5.00/Tab.

Tino (*Delta*), Tab., 50 mg, Tk. 4.00/Tab.

Tispa (*Concord*), Tab., 50 mg, Tk. 5.00/Tab.

Tium (*Ad-din*), Tab., 50 mg, Tk. 3.50/Tab.

Tivis (*Beacon*), Tab., 50 mg, Tk. 5.00/Tab.;

Inj., 5 mg/2 ml, Tk. 16.00/amp.

Tynium (*ACI*), Inj., 5 mg/2 ml, Tk. 15.06/amp.;

Syrup, 10 mg/5 ml, Tk. 85.00/100 ml; Tab.,

50mg, Tk. 5.00/Tab.

2. GASTRO-INTESTINAL SYSTEM

Veralgin (*Aristo*), Inj., 5 mg/2 ml, Tk. 25.00/amp.; Tab., 50 mg, Tk. 6.00/Tab.
Visalex (*Leon*), Tab., 50 mg, Tk. 5.00/Tab.
Visarin (*Pharmasia*), Tab., 50 mg, Tk. 4/Tab.
Viscer (*Techno*), Inj., 5 mg/2 ml, Tk. 12/amp.
Visceral (*Ibn Sina*), Inj., 5 mg/2 ml, Tk. 16.00/amp.; Tab., 50 mg, Tk. 4.50/Tab.
Visegin (*Unimed*), Tab., , Tk. 5.00/Tab.
Viset (*Healthcare*), Inj., 5 mg/2 ml, Tk. 25.00/amp.; Syrup, 10 mg/5 ml, Tk. 90/100ml; Tk. 55.00/50 ml; Tab., 50 mg, Tk. 6.00/Tab.
Visnil (*Nipro JMI*), Tab., 50 mg, Tk. 4.00/Tab.
Visnor (*Apex*), Inj., 5 mg/2 ml, Tk. 15.00/amp; Tab., 50 mg, Tk. 4.00/Tab.
Visonium (*Drug Int.*), Tab., 50 mg, Tk. 4/Tab.
Vispazin (*Globe*), Tab., 50 mg, Tk. 25/Tab.; Inj., 5 mg/2 ml, Tk. 15/2 ml Amp.
Visral (*Opsonin*), Syrup, 10 mg/5 ml, Tk. 63.91/100 ml; Supp., 20 mg, Tk. 6.02/Tab.; Inj., 5 mg/2 ml, Tk. 11.32/amp.; Tab., 50 mg, Tk. 3.02/Tab.
Zeum (*Novartis*), Tab., 50 mg, Tk. 6.50/Tab.

TRIMEBUTINE MALEATE

Indication: Irritable bowel Syndrome
Cautions: Pregnancy, breast feeding, children
Contraindication: should not be taken by anyone who is allergic to trimebutine
Side effects: abdominal pain, constipation, diarrhoea, dry mouth, fatigue, foul taste, headaches, hot or cold sensations, indigestion nausea, rash
Dose: 200 mg 3 times daily before meals.

Proprietary Preparations

Timotor (*Square*), Tab., 100 mg, Tk. 5.01/Tab.
Trimotil (*Incepta*), Tab., 100 mg, Tk. 5.00/Tab.

OTHER ANTISPASMODICS

Alverine, drotaverine, Mebeverine, and peppermint oil are believed to directly relax intestinal smooth muscle and may relieve spasm and pain in irritable bowel syndrome and diverticular disease. They have no serious adverse effects but like all antispasmodics should be avoided in paralytic ileus.

ALVERINE CITRATE

Indications: as an adjunct in gastro-intestinal disorders characterised by smooth muscle spasm; dysmenorrhoea
Contra-indications: paralytic ileus, breast-feeding
Caution: pregnancy,
Side-effects: nausea; dyspnoea; headache, dizziness; pruritus, rash; hepatitis also reported
Dose: ADULT and CHILD over 12 years, 60–120mg 1–3 times daily.

Proprietary Preparations

Alve (*Orion*), Tab., 60 mg, Tk. 5.00/Tab.
Alverin (*Rangs*), Tab., 60 mg, Tk. 5.00/Tab.
Dismonal (*Opsonin*), Tab., 60 mg, Tk. 3.02/Tab.
Spasverin (*Beacon*), Tab., 60 mg, Tk. 5/Tab.

DROTAVERINE HYDROCHLORIDE

Indications: as an antispasmodic in gastro-intestinal colic, biliary and genitourinary colic; tenesmus in dysentery; dysmenorrhoea

Cautions and Contraindications: pregnancy and lactation; impairment of liver or kidney (*Appendix 3 & 4*)

Interactions: see *Appendix-2*

Side-effects: flushing, perspiration, palpitation and vertigo are reported

Dose: by mouth 40-80 mg 3 times daily.
By subcutaneous or intramuscular injection, 40-80 mg up to three times daily

By slow intravenous injection in acute renal colic, 40-80 mg

Proprietary Preparations

Dot (*Acme*), Tab., 40 mg, Tk. 1.76/Tab.; 40mg/2 ml, Tk. 7.02/Amp
Dotarin (*Popular*), Tab., 40 mg, Tk. 1.76/Tab.; Inj., 40mg/2ml, Tk. 7.03/Amp.
Drotapan (*Incepta*), Tab., 40 mg, Tk. 1.75/Tab.
Espa (*Square*), Inj., 40 mg/2 ml, Tk. 7.02/Amp., 40 mg, Tk. 1.75/Tab.
N-Aspa (*Albion*), Tab., 40 mg, Tk. 1.81/Tab.
No-Spa (*Ambee*), Tab., 40 mg, Tk. 1.82/Tab., Inj. 40 mg/2 ml, Tk. 7.98/2 ml amp.
Rova (*Kemiko*), Tab., 40 mg, Tk. 2.00/Tab.
Span (*Opsonin*), Tab., 40 mg, Tk. 1.32/Tab.
Taverin (*Beximco*), Tab., 40 mg, Tk. 2.20/Tab.

2. GASTRO-INTESTINAL SYSTEM

MEBEVERINE HYDROCHLORIDE

Indications: as an adjunct in the treatment of symptomatic relief of gastrointestinal colic, irritable bowel syndrome

Cautions; Contraindications : paralytic ileus, pregnancy and breast-feeding, porphyria; should be used with care in patients with cardiac disorder, hepatic or renal insufficiency

Interactions: see Appendix-2

Side-effects: anorexia, dizziness, headache, insomnia, tachycardia have been reported

Dose: ADULT and CHILD above 12 years 135 mg 3 times daily, preferably 20 mins before meals

Proprietary Preparations

A-Meb (*Acme*), Tab., 135 mg, Tk. 6.00/Tab.
Evarin (*Delta*), Tab., 135 mg, Tk. 6.00/Tab.
Iriban (*Incepta*), SR Tab., 200 mg, Tk. 10.00/Tab.; Tab. 135 mg, Tk. 6.00/Tab.
Irisyn (*Ibn Sina*), Tab., 135 mg, Tk. 7.00/Tab.
Mave (*Opsonin*), SR Cap., 200 mg, Tk. 7.55/Cap.; Tab., 135 mg, Tk. 4.53/Tab.
Mebeverine (*Albion*), Tab., 135 mg, Tk. 6/Tab.
Mebiz (*Sun*), SR Cap., 200 mg, Tk. 10/Cap.
Mespa (*Ambee*), Tab. 135 mg, Tk. 6.02/Tab.
Meverine (*Drug Int.*), SR Cap., 200 mg, Tk. 10.00/Cap.; Tab., 135 mg, Tk. 6.00/Tab.
Mevin (*Square*), SR Cap., 200 mg, Tk. 10/Cap.; 135 mg, Tk. 6.00/Tab.
Rostil (*Beximco*), Tab., 135 mg, Tk. 7.00/Tab.
Veripel (*Beacon*), SR Cap., 200 mg, Tk. 9/Cap.
Veron (*Eskayef*), Tab., 135 mg, Tk. 6.08/Tab.

OTHER DRUGS ALTERING GUT MOTILITY

Gut smooth muscle exhibits intrinsic motor activity which is modified by autonomic innervation, local reflexes and gut hormones to produce peristalsis. Prokinetic drugs which include **domperidone** and **metoclopramide** stimulate the motility of the gut by acting at various points within this complex system to enhance gut movement.

Metoclopramide possesses parasympathetic activity and is a dopamine receptor antagonist with direct effect on the chemoreceptor trigger zone. It

stimulates the motility of upper gastrointestinal tract without affecting secretion. It increases gastric peristalsis leading to accelerated gastric emptying. Metoclopramide is used for its prokinetic and antiemetic properties. It has been used in disorders of decreased gastrointestinal motility such as gastroparesis; in gastroesophageal reflux disease and dyspepsia; in nausea and vomiting associated with cancer chemotherapy; and to stimulate gastric emptying during radiographic examinations.

Domperidone is a dopamine antagonist with actions very similar to those of metoclopramide. It has been used as an antiemetic in nausea and vomiting associated with cancer chemotherapy, and also in disorders of gastrointestinal motility such as diabetic gastroparesis. Cisapride which is another prokinetic drug has recently been withdrawn for its reported serious and fatal arrhythmia.

Neurokinin-receptor antagonists

APREPITANT

It is an antiemetic drug mediates its effect by blocking the neurokinin 1 (NK₁) receptor.

See *sectio section 7.8 Drugs used in nausea, vomiting and vertigo*

Indications: as an adjunct to dexamethasone and a 5HT₃-receptor antagonist in preventing nausea and vomiting associated with moderately and highly emetogenic chemotherapy

Cautions: should not be used concurrently with pimozone, terfenadine, astemizole, or cisapride. Taking aprepitant with these medications could result in **serious or life-threatening problems**

Contra-indications: acute porphyria, hepatic impairment; pregnancy; breast-feeding, child under 18 years of age.

Side-effects: hiccups, dyspepsia, diarrhoea, constipation, anorexia; asthenia, headache, dizziness; less commonly weight changes, dry mouth, colitis, flatulence, stomatitis, abdominal

2. GASTRO-INTESTINAL SYSTEM

pain, duodenal ulcer, taste disturbance, oedema, bradycardia, palpitations, cough, euphoria, anxiety, confusion, drowsiness, thirst, abnormal dreams, chills, hyperglycaemia, polyuria, anaemia, dysuria, haematuria, hyponatraemia, neutropenia, myalgia, conjunctivitis, pharyngitis, sneezing, tinnitus, sweating, pruritus, rash, acne, photosensitivity, and flushing; dyspnoea, insomnia, visual disturbances, dysarthria, urticaria, and Stevens-Johnson syndrome also reported.

Dose: ADULT over 18 years 125 mg 1 hour before chemotherapy, then 80mg daily as a single dose for the next 2 days; consult product literature for dose of concomitant corticosteroid and 5HT₃-receptor antagonist.

Generic Preparations

Capsule, 40 mg

DOMPERIDONE

Indications: see notes above and under section 7.8

Cautions: pregnancy and breast-feeding; not recommended for routine prophylaxis of post-operative vomiting or for prolonged administration.

Interactions: see Appendix-2

Side-effects: rashes and other allergic reactions, raised prolactin concentration (galactorrhoea and gynecomastia), and reduced libido.

Dose: by mouth 10-20 mg 6 times daily; CHILD 200-400 micrograms/kg every 4-8 hours

Proprietary Preparations

Adegut (Supreme), Susp., 5 mg/5 ml, Tk. 28.00/60 ml; Tab., 10 mg, Tk. 2.50/Tab.

Adorex (Ambee), Tab., 10 mg, Tk. 2/Tab; Paed. Drop, 5 mg/ml, Tk. 20.07/15 ml; Suspn. 5 mg/5 ml, Tk. 38.18/100 ml Tk. 28.10/60 ml

Anet (Kemiko), Susp., 5 mg/5 ml, Tk. 35.00/60 ml; Tab., 10 mg, Tk. 2.00/Tab. Paed. drops, 5 mg/ml, Tk. 25.00/15 ml; Supp., 15 mg, Tk. 6.00/Supp.; 30 mg, Tk. 9.00/Supp.

Atidon (Asiatic), Susp 5 mg/5 ml, Tk. 28.00/60 ml; Tab., 10 mg, Tk. 2.00/Tab.

Avomit (Chemist), Tab., 10 mg, Tk. 2.00/Tab.; Suspn., 5mg/5ml, Tk. 28.00/60 ml

Benidon (Benham), Susp., 5 mg/5 ml, Tk. 28./60 ml; 10 mg, Tk. 2.00/Tab.

Cosy (Orion), Susp., 5 mg/5 ml, Tk. 38.14/100 ml; Tk. 28.10/60 ml; Tab., 10 mg, Tk. 2.01/Tab.

Deflux (Beximco), Paed drop, 5 mg/ml, Tk. 20.00/15 ml; Susp., 5 mg/5 ml, Tk. 38/100 ml; Tab., 10 mg, Tk. 2.50/Tab.; DT Tab., 10 mg, Tk. 2.00/Tab.

Degut (Delta), Tab., 10 mg, Tk. 2.00/Tab.

Domar (Pacific), Susp, 5 mg/5 ml, Tk. 18.80/60 ml; Tk. 30.08/100 ml; Tab., 10 mg, Tk. 2.26/Tab.

Domidon (Ziska), Susp., 5mg/5ml, Tk. 28.00/60ml; Tab., 10mg, Tk. 2.00/Tab.

Domilin (General), Susp., 5 mg/5 ml, Tk. 40.15/100 ml; Tab., 10 mg, Tk. 2.01/Tab.;

Domilux (Popular), Susp, 5 mg/5 ml, Tk. 35.00/60ml; Tab., 10 mg, Tk. 2.00/Tab.

Domin (Opsonin), Supp. 15 mg, Tk. 3.77/Supp.; 30 mg, Tk. 6.04/Supp.; Paed drops, 5 mg/ml, Tk. 15.10/15 ml; Susp., 5 mg/5 ml, Tk. 21.14/60 ml 10 mg, Tk. 1.51/Tab.

Dominol (White Horse), Tab., 10mg, Tk. 2/Tab.

Domiren (Renata), Paed drops, 5 mg/ml, Tk. 25.00/15 ml; Susp., 5 mg/5 ml, Tk. 35.00/60 ml; Tk. 38.00/100 ml; Tab., 10 mg, Tk. 2/Tab.

Domp (Albion), Susp., 5 mg/5 ml, Tk. 38.00/100ml; Tab., 10 mg, Tk. 2.00/Tab.

Dompi (Alco), Susp., 5 mg/5 ml, Tk. 28.00/60ml; Tab., 10 mg, Tk. 2.00/Tab.;

Domstal (APC), Susp., 5 mg/5 ml, Tk. 28.00/60 ml; Tab., 10 mg., Tk. 2.00/Tab.

Don-A (Acme), Paed, drops, 5 mg/ml, Tk. 20.07/15 ml; Tk. 25.10/30 ml; Supp., 30 mg, Tk. 8.04/Supp.; 15 mg, Tk. 5.01/Supp.; Susp., 5mg/5 ml, Tk. 35.00/60ml; Tab., 10 mg, Tk. 2.01/Tab.

Dopadon (Ibn Sina), Susp., 5 mg/5 ml, Tk. 30.00/60 ml; Tab., 10 mg, Tk. 2.25/Tab.

Dopagut (Concord), Susp., 5 mg/5 ml, Tk. 28.00/60 ml; Tab., 10 mg, Tk. 2.00/Tab.;

DP Done (Central), Susp., 5 mg/5 ml, Tk. 28.00/60 ml; Tab., 10 mg, Tk. 2.00/Tab.

Dysnov (Unimed), Paed, drops, 5 mg/ml, Tk. 20.00/15 ml; Susp., 5 mg/5 ml, Tk. 38/100 ml; Tab., 10 mg, Tk. 2.00/Tab.

Emidom (Somatec), Susp., 5 mg/5 ml, Tk. 28.11/60 ml; Tab., 10 mg, Tk. 2.50/Tab.

Esogut (Biopharma), Paed. drops, 5 mg/ml, Tk. 20.08/15 ml; Susp., 5 mg/5 ml, Tk. 28.11/60 ml; Tab., 10 mg, Tk. 2.50/Tab.

Gidora (Rephco), Susp., 5 mg/5 ml, Tk. 30.00/100 ml; Tab., 10 mg, Tk. 2.00/Tab.

Gutset (Ad-din), Tab., 10mg, Tk. 2.00/Tab.;

Drop, 5mg/ml, Tk. 20.00/15 ml; Suspn., 60 mg/60 ml, Tk. 28.00/60 ml

I-Pop (Doctor TIMS), Tab., 10 mg, Tk. 2/Tab.

Loval (Jayson), Susp., 5 mg/5 ml, Tk. 28.10/60 ml; Tab., 10 mg, Tk. 2.01/Tab.

Makdom (Maks), Tab., 10 mg, Tk. 2.00/Tab.

Motidom (Medimet), Tab., 10mg, Tk. 1.50/Tab.

2. GASTRO-INTESTINAL SYSTEM

Motifast (*Square*), Tab., 10mg, Tk. 2.50/Tab.; Paed. drops, 5 mg/ml, Tk. 25/15 ml; 5mg/5ml, Tk. 35/60 ml; Tab., 10 mg, Tk. 2.50/Tab.

Motilex (*Techno*), Susp., 5 mg/5 ml, Tk. 35.00/60 ml; Tab., 10 mg, Tk. 2.00/Tab.

Motinorm (*Sharif*), Tab., 10 mg, Tk.2.00/Tab.

Motistat(*Globex*), Tab., 10 mg, Tk. 2.50/Tab.

Noburn (*Beacon*), Tab., 10 mg, Tk. 2.00/Tab.

Normogut (*Rangs*), Syrup, 5mg/5ml, Tk. 38.00/100 ml; Tab., 10mg, Tk. 2.00/Tab.; Paed. Drops, 5 mg/ ml, Tk. 20.00/15 ml

Nudon (*Organic*), Tab., 10 mg, Tk. 2.00/Tab.

Omidon (*Incepta*), Paed. drops, 5 mg/ml, Tk. 25.00/15 ml ;Susp., 5 mg/5 ml, Tk. 35/60 ml; Tk. 38.00/100 ml ; Tab., 10 mg, Tk.2.00/Tab.; Tab., 10 mg, Tk. 2.00/Tab.

Paridon (*Drug Int.*), Susp., 5 mg/5 ml , Tk. 32.00/100 ml ;Tab., 10 mg, Tk. 2.00/Tab.

Peri (*Hudson*), Syrup, 5mg/5ml, Tk.35.00/100 ml; Tab., 10mg, Tk.2.00/Tab.

Peridone (*Astra*), Tab., 10 mg, Tk. 2.00/Tab.

Perigut (*Leon*), Susp., 5 mg/5 ml , Tk. 28/60ml

Perigut (*Leon*), Tab., 10 mg, Tk. 2.00/Tab.

Perion (*Globe*), Susp.,5mg /5 ml, Tk.30/60ml Tk. 38/100ml; Tab., 10 mg, Tk. 2/Tab.

Prokinet (*Nipro JMI*), Susp., 5 mg/5 ml , Tk. 35.00/60 ml ;Tab., 10 mg, Tk. 2.01/Tab.

Ridon (*Eskayef*), Susp., 5 mg/5 ml , Tk. 28.00/60 ml; Tab, 10 mg, Tk. 2.00/Tab., Powder, 10 mg/Sachet, Tk. 5.00/Sachet

Sandom (*Sanofi* ,), Paed. drops, 5 mg/ml, Tk. 20.07/15 ml ;Susp., 5 mg/5 ml , Tk. 28.10/60 ml ; , Tab., 10 mg, Tk. 2.01/Tab.

Sydon (*MST*), Tab., 10 mg, Tk. 2/Tab. Tab. 10 mg, Tk. 2.50/Tab.

Vave (*ACI*), Paed. drops, 5 mg/ml, Tk. 25/15 ml; Susp., 5 mg/5 ml , Tk. 35.00/60 ml; Tk. 40.00/100 ml;Tab., 10 mg , Tk. 2.01/Tab. ODT Tab., 10 mg , Tk. 5.00/Tab.

Vegadon (*Pharmasia*), Susp., 5 mg/5 ml, Tk. 28.10/60 ml ;Tab., 10 mg, Tk. 2.00/Tab.

Vomitop (*Navana*), Paed. drops, 5 mg/ml, Tk. 20.08/15 ml;Susp., 5 mg/5 ml, Tk. 28.00/60 ml; Tab., 10 mg, Tk. 1.50/Tab.

Xepadon (*Amico*), Paed. drops, 5 mg/ml, Tk. 18/15 ml ;Susp., 5 mg/5 ml, Tk. 25/60 ml ; Tab., 10 mg, Tk. 2/Tab.

Xeridon (*RAK*), Susp.,5 mg/5 ml,Tk. 28/60 ml; Tab.,10 mg, Tk. 2/Tab.

METOCLOPRAMIDE HYDROCHLORIDE

see section 7.8

Indications: see notes above

Cautions: hepatic and renal impairment, pregnancy and breast-feeding; avoid for 3-4 days following gastrointestinal surgery.

Interactions: see Appendix-2

Side-effects: drowsiness, restlessness, depression, diarrhoea, extrapyramidal effect (specially in children/ young adult), hyperprolactinaemia.

Dose: by mouth 10 mg 3 times daily; IM/IV 10 mg 3 times daily over 1-2 minutes. CHILD 1-5 mg 3 times daily.

Proprietary Preparations

Maxocol (*Medimet*), Syrup, 5mg/5ml, Tk.15.77/100ml; Tab.,10mg, Tk.0.34/Tab.

Meclid (*Jayson*), Inj., 10 mg/2 ml,Tk. 3.55/2 ml Amp.

Metocol (*Opsonin*), Syrup, 5 mg/5 ml, Tk. 13.92/100 ml; Paed. Drops, 1 mg/ml, Tk. 9.37/15 ml

Migen (*Albion*), Syrup, 100 mg/100 ml, Tk. 13.70/100 ml

Motilon (*Sanofi*), Inj., 10 mg/2 ml, Tk. 3.76/2 ml Amp. ; Paed. drops, 1 mg/ml, Tk. 9.80/15 ml; Syrup, 100 mg/100 ml, Tk. 15.83/100 ml; Tab., 10 mg, Tk. 0.34/Tab.

Nutramid (*Acme*), Tab., 10 mg, Tk. 0.34/Tab.; Syrup, 100 mg/100 ml, Tk. 10.65/60 ml

2.3 ULCER HEALING DRUGS

- 2.3.1 H₂ RECEPTOR ANTAGONISTS
 - 2.3.2 SELECTIVE ANTIMUSCARINICS
 - 2.3.3 PROTON PUMP INHIBITORS
 - 2.3.4 CHELATES AND COMPLEXES
 - 2.3.5 PROSTAGLAND ANALOGUES
 - 2.3.6 DRUGS FOR ERADICATION OF *HELICOBACTER PYLORI*
-

Peptic ulcer causes a distinct break in the gastrointestinal mucosa of stomach or duodenum, although it may occur in lower oesophagus and after surgery in gastroenterostomy stoma. The genesis of peptic ulcer involves infection of gastric mucosa with *Helicobacter pylori* plus other factors such as imbalance between the mucosal damaging mechanisms (acid, pepsin) and mucosal protecting mechanisms (mucus, bicarbonate, PGE₂ and PGI₂). Gastric ulceration and bleeding may also occur with NSAIDs or corticosteroid use. Nearly all duodenal ulcers and most gastric ulcer not associated with NSAIDs are caused by *Helicobacter pylori*. With the discovery of the significance of *H. pylori* infection as the major causative

2. GASTRO-INTESTINAL SYSTEM

factor of peptic ulceration, combined antibacterial and antisecretory therapy is increasingly recommended as the first line of treatment. Two-week triple therapy regimens are associated with high eradication rates, but adverse effects are common and compliance is a problem. Healing can be facilitated by general measures as bed rest, dietary modification, stopping smoking and by continuing antisecretory drug treatment. But relapse is common when treatment ceases. Continued maintenance treatment with H₂ antagonists and sucralfate has been shown to reduce relapse. Maintenance therapy with proton pump inhibitors (omeprazole, lansoprazole) is also effective. For recommended regimens of triple-drug therapy against *H. pylori* infection, see section 2.3.6.

2.3.1 H₂-RECEPTOR ANTAGONISTS

H₂-receptor antagonists reduce gastric acid (both basal and food stimulated) and pepsin output as a result of H₂-receptor blockade. They have been used in peptic ulcer, gastrointestinal reflux diseases and in selected cases of persistent dyspepsia. High doses of H₂-receptor antagonists have been used in the Zollinger-Ellison syndrome, though a proton pump inhibitor (see sec 2.3.3) is now preferred.

Maintenance treatment with low doses of H₂-receptor antagonists have largely been replaced in *H. pylori* positive cases by eradication regimens. Treatment with H₂-antagonists has not been effective in haematemesis and melaena, but once haemorrhage has been controlled H₂-antagonists may be given to promote healing and reduce the risk of rebleeding. Treatment reduces the frequency of acid aspiration in obstetric patients at delivery.

Cautions: H₂-antagonists should be used with caution in patient with hepatic or renal impairment, in pregnancy and in breast feeding. H₂-antagonists may mask the symptoms of gastric cancer.

Side-effects: Adverse reactions are generally infrequent and are usually reversible following a reduction of doses or withdrawal of therapy. The commonest side-effects reported are altered bowel habit, diarrhoea, dizziness, reversible confusion, rashes, headache, myalgia and blood disorders including agranulocytosis, leucopenia and thrombocytopenia; there have been reports of impotence and gynaecomastia.

CIMETIDINE

Indications: benign gastric and duodenal ulceration, stomal ulcer, reflux oesophagitis Zollinger-Ellison syndrome, other conditions where gastric acid reduction is beneficial. (see notes above)

Cautions: see notes above: renal and hepatic impairment (reduce dose); pregnancy and breast-feeding. Avoid intravenous injection in high dosage (may rarely cause arrhythmias) and in cardiovascular impairment.

Interactions: see Appendix-2 (histamine H₂-antagonists) and see notes above

Side-effects: altered bowel habit, dizziness, rash, tiredness; occasionally, gynaecomastia (cimetidine only, and usually only in high dosage), reversible confusional states, reversible liver damage, headache; rarely, decreased blood counts, alopecia, muscle or joint pain, bradycardia and AV block; interstitial nephritis and acute pancreatitis (both cimetidine); see also notes above

Dose: by mouth, 400 mg twice daily (with breakfast and at night) or 800 mg as a single daily dose at night (benign gastric and duodenal ulceration). Doses should be taken for at least 4 weeks (6 weeks in gastric ulceration, 8 weeks in NSAID associated ulceration); when necessary the dose may be increased to 400 mg 4 times daily or rarely (e.g. as in stress ulceration) to a max. of 2.4 g daily in divided doses; CHILD 20-30 mg/kg daily in divided doses.

2. GASTRO-INTESTINAL SYSTEM

Maintenance: 400 mg at night or 400 mg morning and night.

Reflux oesophagitis, 400 mg 4 times daily for 4-8 weeks. In Zollinger-Ellison syndrome, 400 mg 4 times daily or more

Gastric acid reduction (prophylaxis of acid aspiration; do not use syrup), obstetrics 400 mg at start of labour, then up to 400 mg every 4 hours if required (max. of 2.4 g daily); surgical procedures 400 mg 90-120 minutes before induction of general anaesthesia.

Short bowel syndrome, 400 mg twice daily (with breakfast and at bedtime) adjusted according to response.

To reduce degradation of pancreatic enzyme supplements, 0.8-1.6 g daily in 4 divided doses according to response 1-1½ hours before meals.

By intramuscular injection, 200 mg every 4-6 hours; max. 2.4g daily.

By slow intravenous injection, 200 mg given over at least 2 minutes; may be repeated every 4-6 hours; if a large dose is needed or there is cardiovascular impairment, the dose should be diluted and given over at least 10 minutes (infusion is preferable); max. 2.4 g daily.

By intravenous infusion, 400 mg in 100 ml of sodium chloride 0.9% intravenous infusion given over ½ hour (may be repeated every 4-6 hours) or by continuous infusion at an average rate of 50-100 mg/hour over 24 hours, max. 2.4 g daily. CHILD, *by intramuscular injection or slow intravenous injection or infusion*, 20-30 mg/kg body weight daily in divided doses

Generic Preparations

Injection, 200mg/2 ml, Tablet, 400mg; 200mg

FAMOTIDINE

Indications: *see under Dose*

Cautions: *see under Cimetidine and notes above*; does not inhibit hepatic microsomal drug metabolism

Side-effects: *see under Cimetidine*; dry mouth and anorexia also reported

Dose: benign gastric and duodenal ulceration; 20 mg twice daily or 40 mg at night for 4-8 weeks; maintenance 20 mg at night. In Zollinger-Ellison syndrome, 20 mg every 6 hours (higher dose in those who have previously been receiving another H₂-antagonist)

Proprietary Preparations

Famodin (*Acme*), Tab., 20 mg, Tk. 2/Tab.; 40mg, Tk. 4/Tab.

Famotack (*Square*), Tab., 40 mg, Tk. 4/Tab.; 20 mg, Tk. 2/Tab.

Famotid (*Drug Int.*), Tab., 20 mg, Tk. 2/Tab.; 40 mg, Tk. 4/Tab.

Famotidine (*Albion*), Tab., 20 mg, Tk.1.50/Tab.; 40 mg, Tk. 3/Tab.

Novatac (*ACI*), Tab., 40 mg, Tk. 4.12/Tab.; 20mg, Tk. 2.26/Tab.

Servipep (*Novartis*), Tab., 20 mg, Tk. 4/Tab.; 40 mg, Tk. 6/Tab.

Yamadin (*Beximco*), Tab., 20 mg, Tk. 1.90/Tab.; Tab., 40 mg, Tk. 3.82/Tab.

NIZATIDINE

Indications: *see under Dose*

Cautions: *see notes above*; also avoid rapid intravenous injection (risk of arrhythmias and postural hypotension); hepatic impairment

Interactions: *see Appendix-2* (histamine H₂-antagonists) and *notes above*

Pregnancy: avoid unless essential

Breast-feeding: amount too small to be harmful

Side-effects: *see notes above*; also sweating; rarely nausea, fever, vasculitis, hyperuricaemia

Dose: benign gastric, duodenal or NSAID-associated ulceration, treatment, 300 mg in the evening or 150 mg twice daily for 4-8 weeks; maintenance, 150mg at night

Gastro-oesophageal reflux disease, 150-300 mg twice daily for up to 12 weeks. CHILD not recommended

Renal impairment: use half normal dose if eGFR 20-50 mL/minute/1.73m²; use one-quarter normal dose if eGFR less than 20 mL/minute/1.73m²

Generic Preparation

Capsule, 150 mg

2. GASTRO-INTESTINAL SYSTEM

RANITIDINE

Indications: benign gastric and duodenal ulceration stomal ulcer, reflux oesophagitis, Zollinger-Ellison syndrome, other conditions where reduction of gastric acidity is beneficial. (see notes above)

Cautions: see under *Cimetidine*; does not significantly inhibit hepatic microsomal drug metabolism.

Side-effects: see under *Cimetidine*, rare reports of breast swelling and tenderness in men; also rare reports of bradycardia, AV block and asystole.

Dose: by mouth, 150 mg twice daily (morning and night), or for patients with gastric and duodenal ulceration; 300 mg as a single daily dose at night for 4 to 8 weeks, up to 6 weeks in chronic episodic dyspepsia, and up to 8 to 12 weeks in reflux oesophagitis and NSAID associated ulceration; Zollinger-Ellison syndrome, 150 mg 3 times daily, increased if necessary to 6 g daily in divided doses.

For maintenance, 150 mg at night. CHILD, 8-18 years, up to 150 mg twice daily. Gastric acid reduction (prophylaxis of acid aspiration) in obstetrics, by mouth, 150 mg at onset of labour, then every 6 hours.

By intramuscular injection, 50 mg every 6-8 hours.

By slow intravenous injection, 50 mg diluted to 20 ml and given over at least 2 minutes; may be repeated every 6-8 hours.

By intravenous injection, 25 mg/hour for 2 hours; may be repeated every 6-8 hours.

Surgical procedures, by intramuscular or slow intravenous injection, 50 mg 45-60 minutes before induction (intravenous injection diluted to 20 ml and given over at least 2 minutes), or by mouth, 150 mg 2 hours before induction, and also, when possible on the preceding evening.

Proprietary Preparations

Aceptin-R (*Asiatic*), Tab., 150 mg, Tk.2/Tab.;

Acin (*Biopharma*), Tab., 150 mg, Tk. 2.01/Tab.; 300 mg, Tk.3.51/Tab.; Syrup, 75 mg/5 ml, Tk. 45.17/100 ml

Alin (*Rephco*), Tab.,150 mg, Tk.2.50/Tab.

Amurun (*Amulet*), Tab., 150 mg, Tk. 2.00/Tab.

Antac (*Ambee*), Syrup, 75mg / 5ml, Tk. 40.15/100 ml; Tab., 150 mg, Tk. 1.81 /Tab.; Inj., 50 mg / 2 ml, Tk. 5.32/2ml Amp

Asinar (*Sanofi*), Tab., 150 mg, Tk.2.50/Tab.

Astac (*Astra*), Tab., 150 mg, Tk.2.00/Tab.

Benid (*Benham*), Tab.,150 mg, Tk.2.00/Tab.;150 mg, Tk.2.00/Tab.

Ceptin-R (*Leon*), Tab.,150 mg, Tk.2.00/Tab.

Duran (*Techno*), Tab., 300 mg, Tk.4.00/Tab.; Syrup, 75 mg/5 ml, Tk. 40.00/100 ml.; IV Infusion, 50 mg/100 ml, Tk. 60.00/100 ml

Eucon (*Pacific*), Tab.,150 mg, Tk. 1.43/Tab.

Gastab (*Nipro JMI*), Syrup, 75 mg/5 ml, Tk. 45.17/100 ml; Tab., 150 mg, Tk. 2.00/Tab.

Gastroloc (*Beacon*), Tab., 150 mg, Tk.2.00/Tab.;

Gepin (*General*), Inj., 50 mg/2 ml, Tk. 10/Amp. Syrup, 75 mg/5 ml, Tk. 45.17/100 ml.; Tk. 80.30/100 ml;Tab.,150 mg, Tk.2.01/Tab.

G-Ranitidine (*Gonoshasthaya*), Tab.,150 mg, Tk. 1.40/Tab.

Hi-Tac (*Hudson*), Tab., 150mg, Tk.2.00/Tab.

Inseac (*Ibn Sina*), Syrup, 75 mg/5 ml, Tk. 45.00/100 ml.;Tab., 150 mg, Tk. 2.00/Tab.;Tab., 300 mg, Tk.4.00/Tab.

Libret (*Libra*),Inj.,(IV Infusion), 50 mg/100 ml, Tk. 55.21/100 ml

Lumeran (*Aristo*), Tab. 150 mg, Tk.2.00/Tab.

Neceptin R (*Beximco*), Inj., (IV Infusion), 50 mg/100 ml, Tk. 101.00/100 ml.; Inj., 50 mg/2 ml, Tk. 6.00/Amp

Neopep (*Central*), Tab., 150 mg, Tk.2.00/Tab.

Neotack (*Square*), Inj., 50 mg/2ml, Tk. 10.00/amp.;Syrup, 75mg/5 ml, Tk.45.16/100ml

Normacid (*Kemiko*), Inj., 50 mg/2 ml, Tk. 6.00/Amp.; Syrup, 75 mg/5 ml, Tk. 45.00/100 ml.;Tab., 150 mg, Tk.2.50/Tab.

Norma-H (*Renata*), Tab., 150 mg, Tk.2.50/Tab.

Off-H (*Organic*), Tab., 150 mg, Tk.2.50/Tab.

Ortac (*Orion*), Inj, 50 mg/1 ml, Tk. 6.02/amp.; IV Infusion, 50 mg/100 ml 50 mg/100 ml, Tk. 60.23/100 ml;Tab., 150 mg, Tk.2.01/Tab.

Peptil H (*Eskayef*), Syrup, 75 mg/5 ml, Tk. 45.00/100 ml.;Tab, 150 mg, Tk. 1.80/Tab.; Inj, 50 mg/2 ml, Tk. 6.00/amp

Peptosol (*Opso Saline*), IV Infusion, 50 mg/100 ml, Tk. 26.41/100 ml

Protec-R (*Globex*), Tab., 150 mg, Tk. 2/Tab.

Randin (*Maks*), Tab., 150 mg, Tk.2.50/Tab.

Rani (*Alco*), Syrup, 75 mg/5 ml, Tk. 45.00/100 ml.; Tab. 150 mg, Tk.2.00/Tab.

Ranid (*Ziska*), Tab., 150mg, Tk. 1.10/Tab.

Ranidin (*Acme*), Inj., 50 mg/1 ml, Tk. 10/Amp.; Syrup, 75 mg/5 ml, Tk. 45.16/100 ml.; Tab., 150 mg, Tk.2.01/Tab.; 300 mg, Tk.4.01/Tab.

2. GASTRO-INTESTINAL SYSTEM

Ranison (Jayson), Inj., 50 mg/1 ml, Tk. 10.00/Amp.; Tab., 150 mg, Tk.1.73/Tab.
Ranisyn (MST), Tab., 150 mg, Tk. 2.10/Tab.
Ranitab (Sonear), Tab., 150 mg, Tk.2.05/Tab.
Ranitack (Ad-din), Tab., 150mg, Tk.1.50/Tab.
Ranitid (Opsonin), Tab., 150 mg, Tk.1.88/Tab.; 300 mg, Tk.3.02/Tab.; Inj., 50 mg/1 ml, Tk. 7.52/Amp.; Syrup, 75 mg/5 ml, Tk. 33.96/100ml
Ranitidine (Albion), Syrup, 75 mg/5 ml, Tk. 40.00/100ml; Tk. 70.00/200ml.; Tab., 150 mg, Tk.2.00/Tab.
Ranitidine-R (Doctor TIMS), Tab., 150 mg, Tk.2.50/Tab.
Ranitor (Popular), Tab., 150 mg, Tk.1.25/Tab.
Ranix (Chemist), Inj., 50mg/ 2 ml, Tk. 25.00/2 ml Amp.
Rantec (Medimet), Tab., 150mg, Tk.2.00/Tab.; 300mg, Tk.3.50/Tab.
Ranul (Apex), Tab., 150 mg, Tk. 1.00/Tab.
Ravia (Pharmasia), Tab., 150 mg, Tk.1.00/Tab.
Recodin (Concord), Tab., 150 mg, Tk.1.50/Tab.
Reetac-R (Navana), Tab., 150 mg, Tk.1.50/Tab.
Rhine (Healthcare), Tab., 150 mg, Tk.3.00/Tab.
Stomadin (Bios), Tab. 150 mg, Tk. 2.00/Tab. Syrup, 75 mg/5 ml, Tk. 45.00/100 ml.; Tab., 150 mg, Tk. 2.50/Tab.
Tab., 150 mg, Tk.0.25/Tab.; Tab., 300 mg, Tk. 4.50/Tab.
Tinadin (Delta), Tab. 150 mg, Tk.2.00 /Tab.
Ulcarr (Drug Int), Tab. 150 mg, Tk.2.50/Tab.; Tab., 300 mg, Tk.4.00/Tab.
Ultradin (Globe), Tab., 150 mg, Tk. 2.00/Tab.
Veridin (Veritas), Tab., 150 mg, Tk.2.50/Tab.
Wintack (White Horse), Tab., 150 mg, Tk.2.00/Tab.
Xantid (ACI), Inj., 50 mg/2 ml, Tk. 7.53/amp; Tab., 150 mg, Tk. 2.50/Tab.; Tab., 300 mg, Tk. 4.02/Tab.
Xardin (Sharif), Tab., 150 mg, Tk. 1.50/Tab.
Zantac (GSK), Tab., 150 mg, Tk.3.57/Tab.
Zenil (Rangs), Tab., 150mg, Tk. 2.00/Tab.
Zodin (Somatec), Syrup, 75 mg/5 ml, Tk. 40.15/100 ml.; Tab., 150 mg, Tk.2.01/Tab.
Zorep (Amico), Tab., 150 mg, Tk.1.50/Tab.

2.3.2 SELECTIVE ANTIMUSCARINICS

M₁ selective antimuscarinic **pirenzepine** blocks cholinergic stimulation of gastric acid secretion but has some anticholinergic adverse effects. It had been tried in the treatment of peptic ulcer but has now been discontinued.

2.3.3 PROTON PUMP INHIBITORS

These include **Omeprazole, lansoprazole, pantoprazole, rabeprazole and esomeprazole**. They produce profound and sustained inhibition of gastric acid secretion by blocking the hydrogen-potassium-adenosine triphosphate enzyme system (the 'proton pump') of the gastric parietal cell. They are effective short-term treatments for gastric and duodenal ulcers. The response is rapid and sustained (a single daily dose of omeprazole is sufficient to provide effective suppression of gastric acid for a 24 hour period), and thus promotes better compliance than with other anti ulcer drugs. Lansoprazole and pantoprazole appear to be comparable with omeprazole in efficacy.

Proton pump inhibitors are used as one component of the eradication therapy for *H. pylori* infection (See Section 2.3.6). They are the drug of choice in the treatment of gastro-oesophageal reflux diseases with severe symptoms (e.g. structuring). Patients with endoscopically confirmed erosive, ulcerative or stricturing oesophagitis need to be maintained on a proton pump inhibitor. Omeprazole and lansoprazole are effective in the treatment of Zollinger-Ellison syndrome. They are also used in the prevention and treatment of NSAID induced ulcer in-patients who need to continue NSAID treatment.

Cautions: Proton pump inhibitors should be used with caution in patients with liver disease, in pregnancy and in breast-feeding; they may mask the symptoms of gastric cancer.

Side-effects: These include gastrointestinal disturbances (nausea, vomiting, diarrhoea flatulence, abdominal pain), hypersensitivity reactions (rash, urticaria, pruritus, angioedema); occasional headache, malaise, muscle and joint pain, blurred vision and dry mouth.

2. GASTRO-INTESTINAL SYSTEM

DEXLANSOPRAZOLE

Indications: acid reflux, heartburn, difficulty swallowing, persistent cough, stomach ulcers (occasional use)

Cautions : liver disease, bone fracture, shoulder pain, elderly

Side effects: diarrhea, a low magnesium level, persistent muscle spasms, seizures, abdominal or stomach pain, cramping, fever

Dose: 30 mg/60 mg once daily with or without food

Proprietary Preparation

Dexilant (Ziska), Cap. 30 mg, Tk. 9/Cap.; 60mg, Tk. 16/Cap.

Dexlan (Ibn Sina), Cap., 30 mg, Tk. 15/Cap.; Cap., 60 mg, Tk. 25/Cap.

LANSOPRAZOLE

Indications: gastric ulcer, duodenal ulcer, reflux oesophagitis Zollinger-Ellison syndrome; also used in conjunction with other drugs in triple therapy for eradication of *H. pylori*

Cautions: avoid in pregnancy and breast-feeding

Interactions: see Appendix-2

Side-effects: see notes above

Dose: benign gastric ulcer 30 mg daily in the morning before breakfast for a period of 4 to 8 weeks. For gastric or duodenal ulcer associated with *H. pylori* in triple therapy for eradication of *H. pylori*, see section 2.3.6

Proprietary Preparations

Enso (Kemiko), Cap., 15 mg, Tk. 3.00/Cap.; 30 mg, Tk. 5.00/Cap.

Lanzole (Medimet), Cap., 30 mg, Tk. 5.00/Cap.; 5 mg, Tk. 3.00/Cap.

Lansec (Drug Int), Cap., 15 mg, Tk. 3.50/Cap. 30 mg, Tk. 6.00/Cap.

Lansina (Ibn Sina), Cap., 30 mg, Tk. 6.00/Cap.

Lanso (Square), Cap., 15 mg, Tk. 3.51/Cap.; 30 mg, Tk. 6.02/Cap.

Lansocon (Biopharma), Cap., 30 mg, Tk. 6.00/Cap.

Lansodin (Acme), Cap., 15 mg, Tk. 3.51/Cap.; 30 mg, Tk. 6.02/Cap.

Lansoprazole (Albion), Cap., 15 mg, Tk. 3.50/Cap.; 30 mg, Tk. 6.00/Cap.

Lansopril (Amico), Cap., 15 mg, Tk. 3.50/Cap.; 30 mg, Tk. 5.00/Cap.

Lansoprol (Ziska), Cap., 30 mg, Tk. 4.00/Cap.

Lantid (Opsonin), Cap., 15 mg, Tk. 2.26/Cap.; 30 mg, Tk. 3.77/Cap.

Lap (Ambee), Cap., 30 mg, Tk. 5.01/Cap.

Protolan (Beximco), Cap., 15 mg, Tk. 4.00/Cap.; 30 mg, Tk. 6.00/Cap.

Zoton (General), Cap., 15 mg, Tk. 3.51/Cap.; Cap., 30 mg, Tk. 6.02/Cap.

ESOMEPRAZOLE

Indications: listed in dosage

Caution: see notes above; exclude gastric malignancy before treatment; severe hepatic impairment

Interactions: see Appendix-2

Side-effects: headache, abdominal pain, diarrhoea, nausea, vomiting, pruritus, dizziness

Dose: erosive reflux esophagitis: 20-40 mg once daily for 4-8 weeks; maintenance, 20 mg once daily

Symptomatic gastro-esophageal reflux: 20 mg once daily for 4 weeks

Triple therapy for eradication of *H. pylori* 20 mg twice daily (with 1 g amoxicillin twice daily and 500mg clarithromycin twice daily for 7 days)

Proprietary Preparations

Alton (General), Inj., 40 mg/Vial, Tk. 100/Vial; Tab., 20 mg, Tk. 5/Tab.; 40 mg, Tk. 8/Tab.

Asozit (White Horse), Cap., 20 mg, Tk. 7/Cap.

Curacid (Rangs), Cap., 20mg, Tk. 6.00/Cap.; 40mg, Tk. 9.00/Cap.

Ema (Globe), Cap., 20 mg, Tk. 7.00/Cap; 40 mg, Tk. 9.00/Cap.; Tab., 20 mg, k. 4.75/Tab.; 40 mg, Tk. 8.00/Tab.; IV Inj., 40 mg/vial, Tk. 80.00/Vial

Emep (Aristo), Cap., 20 mg, Tk. 7/Cap.; 40mg, Tk. 9/Cap.; Inj., 40 mg/Vial, Tk. 90/Vial; Tab., 20 mg, Tk. 5/Tab.

Eprazol (Labaid), Cap., 20 mg, Tk. 7/Cap.

E-Proton (Doctor TIMS), Cap., 20 mg, Tk. 7/Cap.

Erazole (Kemiko), Tab. 20 mg, Tk. 5/Tab.

Esmax (Concord), Cap., 20 mg, Tk. 6/Cap.; 40mg, Tk. 8/Cap; Tab., 20 mg, Tk. 5/Tab.

Esmosec (Techno), Tab., 20 mg, Tk. 5/Tab.; 40 mg, Tk. 8/Tab.

Eso (Asiatic), Tab., 20 mg, Tk. 5.00/Tab.

Esocon (Biopharma), Cap., 20 mg, Tk. 6/Cap.; 40 mg, Tk. 9/Cap.; Inj., 40 mg/Vial, Tk. 65/Vial

Esofour (Albion), Cap., 20 mg, Tk. 6/Cap.; 20mg, Tk. 6/Cap. Tab., 20 mg, Tk. 5/Tab.; 40mg, Tk. 7/Tab.

Esogel (Organic), Cap., 40 mg, Tk. 8.00/Cap.

2. GASTRO-INTESTINAL SYSTEM

Esoking (Globex), Cap., 20 mg, Tk. 6.00/Cap.
Esolin (Rephco), Tab. 40 mg, Tk. 8.00/Tab. ; 20 mg, Tk. 4.00/Tab.
Esolok (Ibn Sina), Cap., 20 mg, Tk. 7.00/Cap.; 40 mg, Tk. 8.00/Cap. ;Tab. , 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 7/Tab.; Inj., 40 mg/Vial, Tk. 100/Vial
Esomenta (RAK), Cap., 20 mg, Tk. 7.00/Cap.;Cap., 40 mg, Tk. 10.0/Cap.
Esomep (ACI), Cap., 20 mg, Tk. 7.00/Cap. ; 40 mg, Tk. 9.00/Cap. ;Tab. , 20 mg , Tk. 5.00/Tab. ; 40 mg , Tk. 8.00/Tab.Inj., 40 mg/Vial, Tk. 90.00/Vial
Esomo (Amulet), Cap., 20 mg, Tk. 6.00/Cap.; 40 mg, Tk. 8.00/Cap.
Esonix (Incepta), Cap., 20 mg, Tk. 7.00/Cap. ; 40 mg, Tk. 9.00/Cap.; Inj., 40 mg/Vial, Tk. 90.00/Vial ;Tab., 40 mg, Tk. 8.00/Tab. ;, 40 mg, Tk. 5.00/Tab.
Esopra (Alco), Cap., 20 mg, Tk. 6.00/Cap. ; 40 mg, Tk. 9.00/Cap Tab. , 20 mg, Tk. 4.00/Tab.; Tab. , 40 mg, Tk. 7.00/Tab.
Esoprex (Beacon), Cap. , 20 mg, Tk. 6.00/Cap.; 20 mg, Tk. 6.00/Cap.; 40 mg, Tk. 8.00/Cap.;Inj., 40 mg/Vial, Tk. 100.00/Vial
Esoprol (Ziska), Cap., 20mg, Tk. 5.00/Cap; 40mg, Tk. 8.00/Cap.
Esoral (Eskayef), Cap, 20 mg, Tk. 7.00/Cap.; Tab, 20 mg, Tk. 5.00/Tab. ; , Tab, 40 mg, Tk. 8.00/Tab.; Cap, 40 mg, Tk. 9.00/Cap.; Inj, 40 mg/Vial, Tk. 90.00/Vial
Esotac (Navana), Tab., 40 mg, Tk. 7.03/Tab.;Cap., 20 mg, Tk. 6.00/Cap. 40 mg, Tk. 8.00/Cap.
Esotid (Opsonin), Cap., 20 mg, Tk. 4.53/Cap.; 40 mg, Tk. 6.79/Cap.;Powder, 20 mg/Sachet, Tk. 4.51/Sachet;Tab., 20 mg, Tk. 3.77/Tab. 40 mg, Tk. 6.02/Tab;Inj., 40 mg/Vial, Tk. 67.67/Vial
Esotor (Nipro JMI), Tab. , 20 mg, Tk. 5.00/Tab. ; 40 mg, Tk. 8.00/Tab.
Esover (Veritas), Cap. , 20 mg, Tk. 7.00/Cap.;40 mg, Tk. 9.00/Cap.
Esoz (Astra),Cap., 20 mg, Tk. 5.00/Cap.
Esprazo (Pacific), Cap., 20 mg, Tk. 3.76/Cap.
Exium (Radiant), Cap. , 20 mg, Tk. 7.50/Cap.; 40 mg, Tk. 9.50/Cap.
Exmart (MST), Tab., 20 mg, Tk. 5/Cap.; 40 mg, Tk. 8/Tab.
Exome (Chemist), Tab., 20 mg, Tk. 5.00/Tab.
Exor (Orion), Cap. , 20 mg, Tk. 6.00/Cap.; 40 mg, Tk. 9.00/Cap. ;Inj, 40 mg/Vial, Tk. 100.00/Vial
iMAX (Delta), Cap. , 20 mg, Tk. 5.00/Cap.
Maxima (Acme), Cap., 20 mg, Tk. 7.00/Cap.; 40 mg, Tk. 9.00/Cap.;Inj., 40 mg/Vial, Tk. 90.00/Vial
Maxpro (Renata), Cap. , 20 mg, Tk. 7.00/Cap.; Cap. , 40 mg, Tk. 8.00/Cap. Tab. , 20 mg, Tk. 5.00/Tab. ;40 mg, Tk. 8.00/Tab.; Inj., 40 mg/Vial, Tk. 90.00/Vial
Neptor (Novartis), Cap. , 20 mg, Tk. 8.00/Cap.; Cap., 40 mg, Tk. 12.00/Cap.
Nexcap (Unimed), Cap. , 20 mg, Tk. 7.00/Cap.; 40 mg, Tk. 9.00/Cap.
Nexe (Apex), Tab. , 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 8.00/Tab.; Cap., 20 mg, Tk. 6.00/Cap.
Nexum (Square), Cap., 20 mg, Tk. 6.02/Cap.; 40 mg, Tk. 9.03/Cap. Tab. , 20 mg, Tk. 5.01/Tab.; 40 mg, Tk. 8.04/Tab., Inj., 40 mg/Vial, Tk. 90.00/Vial
Opton (Beximco),Tab.20 mg,Tk. 5.00/Tab.; 40mg, Tk. 8.00/Tab.; Cap., 20 mg, Tk. 7/Cap.; 40 mg, Tk.10/Cap.; Inj., 40 mg/Vial Tk. 110.00/Vial
Pepzol (Leon), Cap., 20 mg, Tk. 7.00/Cap. ; 40 mg, Tk. 10.00/Cap.
Prazia (Amico), Tab., 40 mg, Tk. 8.00/Tab.; 20mg, Tk. 5.00/Tab.
Progut (Popular), Tab. , 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 8.00/Tab. ; Cap. , 40 mg, Tk. 9.00/cap;20mg Tk.7.00/cap Inj., 40 mg/Vial, Tk. 70.26/Vial;
Pronex (Drug Int.), Inj., 40 mg/Vial, Tk. 90.00/Vial ;Tab. , 20 mg, Tk. 5.00/Tab. ;Tab. , 40 mg, Tk. 8.00/Tab.
Sergel (Healthcare), Cap., 20 mg, Tk. 7.00/Cap. ;40 mg, Tk. 10.00/Cap.; Inj., 40 mg/Vial, Tk. 100.00/Vial; Tab., 20 mg, Tk. 7.00/Tab.; 40 mg, Tk. 9.00/Tab.
Somazole (Ad-din), Cap., 20mg, Tk. 5.00/Cap.; 400mg, Tk. 8.00/Cap.
S-Ome (Somatec), Tab. , 20 mg, Tk. 4.01/Tab. ; 40 mg, Tk. 7.03/Tab
Sompraz (Sun), Tab. , 20 mg, Tk. 6.00/Tab;40 mg, Tk. 9.00/Tab.;;
Somprazol (Sharif), Cap. , 20 mg, Tk. 6.00/Cap. ; 40 mg, Tk. 9.00/Cap.

esomeprazole + Naproxen
Anaflex Max (ACI), Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
DemovoTM (Delta), Tab. , 20 mg + 375 mg, Tk. 8.00/Tab. ; 20 mg + 500 mg, Tk. 10/Tab.
Dinovo (Beximco)Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Emaprox (Globe), Tab.,20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg , Tk. 10.00/Tab.
Esona (Navana), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Esoxen (Organic), Tab., Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Inflect (Kemiko), Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.;Tab., 20 mg + 500 mg, Tk. 10/Tab.
Locin (Globe), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Nameso (Opsonin), Tab., 20 mg + 375 mg, Tk. 6.02/Tab.; 20 mg + 500 mg, Tk. 7.52/Tab.
Napren ES (Alco), Tab. , 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Napro-A Plus (Acme), Tab.,Tk. 8.00/Tab.;20 mg + 500 mg, Tk. 10.00/Tab.

2. GASTRO-INTESTINAL SYSTEM

Naproxlex (Somatec), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; Tab., 20 mg + 500 mg, Tk. 10.00/Tab.
Naprosyn Plus (Radiant), Tab., 20 mg + 500 mg, Tk. 20.00/Tab.
Naprotec (Sharif), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Naprox Plus (Eskayef), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; Tab., 20 mg + 500 mg, Tk. 10.00/Tab.
Naproxen Plus (Albion), Tab., 20 mg + 500 mg, Tk. 6.89/Tab.
Naprozol (General), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; Tab., 20 mg + 500 mg, Tk. 10.00/Tab.
Napsec (Drug Int), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; Tab., 20 mg + 500 mg, Tk. 10.00/Tab.
Napxon (Ziska), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Nasopain (RAK), Tab., 20 mg + 375 mg, Tk. 10.0/Tab.; 20 mg + 500 mg, Tk. 12.0/Tab.
Neso (Aristo), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Novaxen Plus (Leon), Tab., 20 mg + 500 mg, Tk. 10.00/Tab.
Novoxen (Orion), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Nupralgin Plus (Ibn Sina), Tab., 20 mg + 500 mg, Tk. 10.00/Tab.; 20 mg + 375 mg, Tk. 8.00/Tab.
Progesic (Incepta), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10/Tab.
Progut-N (Popular), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.
Ranoxen Plus (Rangs), Tab., 20 mg + 500 mg, Tk. 10.00/Tab.
Solivo (Healthcare), Tab., 20 mg + 375 mg, Tk. 13.00/Tab.; 20 mg + 500 mg, Tk. 15/Tab.
Twist (Chemist), Tab., 20 mg + 500 mg, Tk. 10.00/Tab.
Xenole (Square), Tab., 20 mg + 375 mg, Tk. 8.00/Tab.; 20 mg + 500 mg, Tk. 10.00/Tab.

OMEPRAZOLE^[ED]

Indications: see notes above

Cautions: see notes above; exclude malignancy.

Interactions: see Appendix-2

Side-effects: see notes above

Dose: benign gastric and duodenal ulcers, 20 mg once daily for 4 weeks in duodenal ulceration or 8 weeks in gastric ulceration; in severe cases increase to 40 mg daily; long term use not recommended

Benign gastric or duodenal ulcer associated with *H. pylori*, see section 2.3.6 for eradication therapy.

Zollinger-Ellison syndrome, initially 60 mg once daily; usual range 20-120 mg daily (above 80 mg in 2 divided doses).

Erosive reflux oesophagitis, 20 mg daily for 4 weeks, followed by a further 4 weeks if not fully healed; 40 mg daily has been given for 8 weeks in reflux oesophagitis refractory to other treatment.

Proprietary Preparations

Aspra (Apex), Cap., 20 mg, Tk. 4.00/Cap.;
Cosec (Drug Int.), Cap., 20 mg, Tk. 5.00/Cap., 40 mg, Tk. 8.00/Cap.; Inj., 40 mg/vial, Tk. 90.00/Vial
Curacid (Rangs), Cap., 20mg, Tk. 6.00/Cap.; 40mg, Tk. 9.00/Cap.
Ema (Globe), Cap., 20 mg, Tk. 7.00/Cap; 40 mg, Tk. 9.00/Cap.; Tab., 20 mg, k. 4.75/Tab.; 40 mg, Tk. 8.00/Tab.; IV Inj., 40 mg/vial, Tk. 80.00/Vial
Esoprol (Ziska), Cap., 20mg, Tk. 5.00/Cap; 40mg, Tk. 8.00/Cap.
Eupi (Pharmasia), Inj., 40 mg/vial, Tk. 80.00/Vial; Cap., 20 mg, Tk. 5.00/Cap.
Exmart (MST), Tab., 20 mg, Tk. 5/Cap.; 40 mg, Tk. 8/Tab.
Exome (Chemist), Tab., 20 mg, Tk. 5.00/Tab.
G-Omeprazole (Gonosasthaya), Cap., 20mg, Tk 3.00/Cap.; Inj., 40 mg/vial, Tk. 65.00/Vial
Healer (Amico), Cap., 20 mg, Tk. 4.00/Cap.
Inhibita (Delta), Cap., 20 mg, Tk. 4.00/Cap.; 40 mg, Tk. 7.00/Cap.
Inpro (Biopharma), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 7.03/Cap.; Inj., 40 mg/vial, Tk. 70.00/Vial
I-Proton (Doctor TIMS), Cap., 20 mg, Tk. 5.00/Cap.
Losectil (Eskayef), Cap., 10 mg, Tk. 2.00/Cap. 20 mg, Tk. 4.00/Cap.; 40 mg, Tk. 7.00/Cap. Inj., 40 mg/vial, Tk. 70.00/Vial ; Sachet, 20 mg, Tk. 5.00/Sachet; 40 mg, Tk. 8.00/Sachet
Lotil (Albion), Cap., 20 mg, Tk. 2.95/Cap.; 40 mg, Tk. 4.00/ Tab.
Neopra (Supreme), Cap., 20 mg, Tk. 5.00/Cap.
Norain (GSK), Cap., 20 mg, Tk. 4.40/Cap.
O-20 (Asiatic), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 7.00 /Cap.
OC-20 (Central), Cap., 20 mg, Tk. 4.00/Cap.
OLE (Bios), Cap., 20 mg, Tk. 4.00/Cap.; 20 mg, Tk. 4.00/Cap.
Ome (Somatec), Cap., 20 mg, Tk. 4.00/Cap.; 40 mg, Tk. 8.00/Cap.
Omeben (Benham), Cap., 20 mg, Tk. 5/Cap.

2. GASTRO-INTESTINAL SYSTEM

Omepron (*Nipro JMI*), Cap., 20 mg, Tk. 6.00/Cap.; 40 mg, Tk. 8.00/Cap.
Omegut (*Popular*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 7.03/Tab.; Inj., 40mg/Vial, Tk.80.00/Vial
Omelet (*Amulet*), Cap., 40 mg, Tk. 7.00/Cap.; Cap., 20 mg, Tk. 5.00/Cap.
Omenix (*Incepta*), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 8.00/Cap. Inj., 40 mg/vial, Tk. 90.00/Vial; Sachet, 20 mg, Tk. 6.00/Sachet; 40 mg, Tk. 10.00/Sachet
Omenta (*RAK*), Cap., 20 mg, Tk.5.0/Cap.; Inj., 40 mg/vial, Tk. 90.00/Vial
Omepr (*Aristo*), Inj., 40mg/vial, Tk. 80.00/Vial; Cap., 10 mg, Tk. 2.00/Cap.; 20 mg, Tk. 5.00/Cap.; 40 mg, Tk.7.00/Cap.
Omepra (*Alco*), Cap. 20 mg, Tk. 4.00/Cap.; Cap., 40 mg, Tk. 7.00/Cap.
Omeprazole (*APC*), Cap., 20 mg, Tk. 2.50/Cap.
Ometac (*Navana*), Cap., 20 mg, Tk. 4.02/Cap.; 40 mg, Tk. 6.02/Cap.
Ometid (*Opsonin*), Cap., 20 mg, Tk. 3.76/Cap.; 40 mg, Tk. 5.29/Cap.; Inj., 40 mg/vial, Tk. 67.67/Vial.;Sachet, 40 mg , Tk. 3.76/Sachet
Ometor (*Astra*),Cap., 20 mg, Tk. 4.00/Cap.
Omex (*Kemiko*), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 7.00/Cap.
Omimak (*Maks*), Cap., 20 mg, Tk. 5.00/Cap.
Omirex (*Jayson*), Cap., 20 mg, Tk. 5.00/Cap.;Cap., 40 mg, Tk. 8.00/Cap.
Omizit (*White Horse*), Cap., 20 mg, Tk. 4.00/Cap.
Omsec (*Techno*), Cap., 20 mg, Tk. 4.00/Cap.; Inj., 40 mg/vial, Tk. 70.00/Vial
OP max (*Concord*), Cap., 20 mg, Tk. 4.00/Cap.; Cap., 40 mg, Tk. 7.00/Cap.
Opal (*Healthcare*), Cap., 20 mg, Tk. 10.00/Cap.; 40 mg, Tk. 8.00/Cap.; Inj., 40mg/vial, Tk. 95.00/Vial.
Peptral (*Labaid*), Cap., 20 mg, Tk. 5.00/Cap.
Perizol (*Leon*), Cap., 20 mg, Tk. 5.00/Cap.; Cap., 40 mg, Tk. 8.00/Cap.
Piazol (*Globex*), Cap., 20 mg, Tk. 5.00/Cap.
PPI (*Acme*), Cap., 40 mg, Tk. 8.00/Cap.; 20 mg, Tk. 4.01/CapInj., 40 mg/vial, Tk. 80.00/Vial
Prazo (*Pacific*), Cap., 20 mg, Tk. 2.25/Cap.; 20 mg, Tk. 2.25/Cap.; Tab., 20 mg, Tk. 1.88/Tab.
Prazole (*Renata*), Cap., 20 mg, Tk. 4.02/Cap.
Prazover (*Veritas*), Cap., 20 mg, Tk. 5/Cap.
Presec (*Unimed*), Cap., 20 mg, Tk.4.00/Cap.; 40 mg, Tk. 7.00/Cap.
Prevas (*General*), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 7.03/Cap.Inj., 40 mg/vial, Tk. 80.00/Vial
Probitor (*Novartis*), Cap., 20 mg, Tk. 7.00/Cap.; 40 mg, Tk. 10.00/Cap.
ProCap (*Orion*), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 8.00/Cap.

Proceptin (*Beximco*), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 8.00/Cap.; Inj., 40mg/vial, Tk. 100.00/Vial
Prolok (*Ibn Sina*), Cap., 20 mg, Tk. 5.00/Cap.; Inj., 40 mg/vial, Tk. 90.00/Vial
Promezol (*Sharif*), Cap., 20 mg, Tk.5.00/Cap.; 40 mg, Tk. 8.00/Cap.
Prosectil (*Pharmacil*), Cap., 20 mg, Tk. 5.00/Cap.; Inj., 40 mg/vial, Tk. 90.00/Vial
Regerd (*Organic*), Cap., 20 mg, Tk. 5.00/Cap.;40 mg , Tk. 7.00/Cap.
Rome (*Rephco*), Cap., 20 mg, Tk. 5.00/Cap.
Sectlo (*Square*), Cap., 20 mg, Tk. 5.00/Cap.; 40 mg, Tk. 8.00/Cap.;Inj., 40 mg/vial, Tk. 80.00/Vial.; DR Tab., 20 mg, Tk. 5.00/Tab.
Somazole (*Ad-din*), Cap., 20mg, Tk. 5.00/Cap.; 400mg, Tk. 8.00/Cap.
Stosec (*Opso Saline*), Inj., 40 mg/vial, Tk. 52.83/Vial
Xeldrin (*ACI*), Inj., 40 mg/vial , Tk. 70.26/Vial.; Cap., 10 mg, Tk. 2.01/Cap.; 20 mg, Tk. 5.00/Cap.; 40 mg , Tk. 8.00/Cap.
Xelopes (*Beacon*), Cap., 40 mg, Tk. 6.97/Cap.; 20 mg, Tk. 5.00/Cap.; Inj., 40 mg/vial, Tk. 90.00/Vial
Xerosec (*Sanofi*), Cap., 10 mg, Tk. 2.51/Cap.; 20 mg, Tk.5.00/Cap.; 40 mg, Tk.8.00/Cap.
Zilon (*Radiant*), Cap., 20 mg, Tk.5.00/Cap.;40 mg, Tk. 7.50/Cap.

PANTOPRAZOLE

Indications: for suppression of acid secretion in gastric or duodenal ulcer, reflux oesophagitis Zollinger-Ellison syndrome; prophylaxis against acid aspiration syndrome during induction of anaesthesia. In conjunction with other drugs, for the eradication of *H. pylori*

Interactions: see *Appendix-2*

Side-effects: see *notes above*

Dose: by mouth in benign gastric ulcer or gastroesophageal reflux disease, 40 mg daily in the morning for 4 weeks, followed by further 4 weeks if not fully healed

Duodenal ulcer or gastritis associated with *H. pylori*, 40 mg twice daily (with clarithromycin 250mg twice daily and metronidazole 400mg twice daily) for 7 days.CHILD not recommended.

Proprietary Preparations

Europan (*Globe*), Inj., 40 mg, Tk. 70.00/Vial; Tab., 40 mg, Tk.6.00/Tab; 20 mg, Tk. 4.00/Tab.

2. GASTRO-INTESTINAL SYSTEM

Exipro (*Leon*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Nixpan (*Ad-din*), Tab., 20 mg, Tk. 3.00/Tab.; 40 mg, Tk. 5.00/Tab.
P-20 (*Asiatic*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Pagerd (*Organic*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Panoral (*Eskayef*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Panoz (*Astra*), Tab., 20 mg, Tk. 4.00/Tab.
Panprazo (*Pacific*), Tab., 20 mg, Tk. 3.01/Tab.
Panpro (*Biopharma*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 6.00/Tab.; Inj., 40 mg/Vial, Tk. 70.00/Vial
Pansec (*Drug Intl*), Tab., 20mg, Tk.5.00/Tab.; 40 mg, Tk. 7.00/Tab.; Inj., 40 mg/Vial, Tk. 90.00/Vial
Pansiv (*MST*), Tab., 20 mg, Tk. 4/Tab.; 40 mg, Tk. 6/Tab.
Pansos (*Nipro JMI*), Tab., 20mg, Tk. 3.00/Tab.; 40 mg , Tk. 5.00/Tab.
Pantac (*Navana*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Pantex (*ACI*), Tab., 20 mg , Tk.4.00/Tab.; 40 mg , Tk. 6.00/Tab.; 40 mg/Vial, Tk. 70.26/Vial
Pantid (*Opsonin*), Tab., 20 mg, Tk. 2.26/Tab.; 40 mg, Tk. 3.77/Tab.; Inj., 40 mg/Vial, Tk. 63.91/Vial
Pantium (*Radiant*), Tab., 20 mg, Tk. 7.00/Tab.; 40 mg, Tk. 10.00/Tab.
Panto (*Somatec*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Pantobex (*Beximco*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 7.00/Tab.; Inj., 40 mg/Vial, Tk. 110.00/Vial
Pantochem (*Chemist*), Tab., 20 mg, Tk. 3.00/Tab.; 40 mg, Tk. 5.00/Tab.
Pantodac (*Ziska*), Tab., 20mg, Tk. 3.00/Tab.; 40mg, Tk. 9.00/Tab.
Pantogen (*General*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 7.00/Tab.
Pantogut (*Popular*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Pantolok (*Ibn Sina*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 5.00/Tab.; Inj., 40 mg/Vial, Tk. 80.00/Vial
Pantomak (*Maks*), Tab., 20 mg, Tk. 4.00/Tab.
Pantomax (*Pharmacil*), Inj., 40 mg/Vial, Tk.90.00/Vial
Pantonix (*Incepta*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 7.00/Tab.; Inj., 40 mg/Vial, Tk.90.00/Vial
Pantopra (*Alco*), Tab., 20 mg, Tk. 3.00/Tab.; 40 mg, Tk. 5.00/Tab.
Pantoprazole (*Albion*), Tab., 20 mg, Tk. 3.00/Tab.; 40 mg, Tk. 5.00/Tab.
Pantosec (*Techno*), Inj., 40 mg/Vial, Tk. 70.00/Vial
Pantover (*Veritas*), Tab., 20 mg, Tk. 4.00/Tab.; Inj., 40 mg/Vial, Tk. 70.00/Vial
Pantrol (*Apex*), Tab., 20 mg, Tk. 3.00/Tab.

Panzer (*Sun*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Panzol (*Amico*), Tab., 20 mg, Tk. 3.50/Tab.; 40 mg, Tk. 5.50/Tab.
PC (*Central*), Tab., 20 mg, Tk. 4.00/Tab.
Pentosa (*Pharmasia*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Pramax (*Concord*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Prazolin (*Rephco*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.
Pregel (*Healthcare*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 7.00/Tab.
Protium (*Unimed*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 9.00/Tab.
Protocid (*Acme*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk. 6.00/Tab.; Inj., 40 mg/Vial, Tk.70.26/Vial
Protoloc (*Beacon*), Tab., 20 mg, Tk. 4.00/Tab.; 40 mg, Tk.6.00/Tab.
Protonil (*Renata*), Tab., 20 mg, Tk.4.00/Tab.; DR Tab., 40 mg, Tk. 6.00/Tab.
Proton-P (*Aristo*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk.7.00/Tab.; Inj., 40 mg/Vial, Tk. 80.00/Vial
Topra (*Jayson*), Tab., 20 mg, Tk.3.00/Tab.; 40 mg, Tk.5.02/Tab.
Trupan (*Square*), Tab., 20 mg, Tk. 5.00/Tab.; 40 mg, Tk. 7.00/Tab.; Inj., 40 mg/Vial, Tk. 80.00/Vial
Zopan (*Kemiko*), Tab., 20 mg, Tk.4.00/Tab.; 40 mg, Tk. 6.00/Tab.

RABEPRAZOLE SODIUM

Indications: listed in dose

Cautions: see notes above; exclude gastric malignancy before starting treatment

Contra-indications: pregnancy and breast-feedings

Interactions: see Appendix-2

Side-effects: chest pain, neck rigidity, Hypertension, Abnormal ECG, GI disturbances, anxiety, insomnia

Dose: erosive or ulcerative gastroesophageal reflux disease, 20 mg daily for 4-8 weeks; may be extended for further 8 weeks if necessary; maintenance, 20 mg daily

Duodenal ulcer, 20mg daily for 4 weeks. Pathological hypersecretory conditions including Zollinger-Ellison syndrome, initially 60 mg once daily, may be increased to 100-120 mg daily

2. GASTRO-INTESTINAL SYSTEM

Proprietary Preparations

Rabeprazole sodium 20mg
Acifix (*Beximco*), Tab., Tk. 5.00/Tab.
Finix (*Opsonin*), Tab., Tk. 3.77/Tab.
Paricel (*ACI*), Tab., Tk. 5.02/Tab.
Rabe (*Aristo*), Tab., Tk. 5.00/Tab.
Rabeca (*Square*), Tab., Tk. 5.00/Tab.
Rabecan (*Biopharma*), Tab. Tk. 5.00/Tab.
Rabepes (*Beacon*), Tab., Tk. 5.00/Tab.
Rabeprazole (*Albion*), Tab. Tk. 5.00/Tab.
Rabeprol (*Somatec*), Tab., Tk. 5.00/Tab.
Rabesec (*Drug Int*), Tab., Tk. 5.00/Tab.
Rabetac (*Navana*) Tab., Tk. 5.00/Tab.
Rabifast (*Eskayef*), Tab., Tk. 5.00/Tab.
Rabigut (*Popular*), Tab., Tk. 7.00/Tab.
Rabizol (*Acme*), Tab., Tk. 5.00/Tab.
Rabonac (*Sharif*), Tab., Tk. 5.00/Tab.
Raboz (*Leon*), Tab. Tk. 5.00/Tab.
Rasonix (*Incepta*), Tab., Tk. 5.00/Tab.
Razole (*Kemiko*), Tab., Tk. 5.00/Tab.
Recepta (*Medimet*), Tab. Tk. 7.00/Tab.
Respite (*Sanofi*), Tab., Tk. 5.00/Tab.

2.3.4 CHELATES AND COMPLEXES

Tripotassium dicitratobismuthate is a bismuth chelate, which promotes healing of gastric and duodenal ulcers. It may act by coating the ulcer or by stimulating bicarbonate secretion. As it is also likely to adhere to food rather than to the surface of the ulcer, patients should be advised to avoid large food, antacids, and large quantities of milk when taking bismuth chelate.

Sucralfate is a complex of aluminium hydroxide and sulphated sucrose and has minimal antacid properties. It has been used for gastric and duodenal ulcers and may act by protecting the mucosa from acid pepsin attack. Long term use needs further assessment because some aluminium may be absorbed.

BISMUTH CHELATE

(Tripotassium dicitratobismuthate)

Indications: palliative treatment of benign gastric and duodenal ulceration

Cautions: avoid in severe renal impairment, pregnancy and lactation; see also notes above

Side-effects: may darken tongue and blacken faeces; reduces absorption of iron and calcium

Dose: 240 mg two times daily half an hour before breakfast and evening meals; may be used initially for 4 weeks, and if required max. for up to 8 weeks

Generic Preparation

Tablet, 120 mg

SUCRALFATE

Indications: palliative treatment of benign gastric and duodenal ulceration; chronic gastritis

Cautions: renal disease

Interactions: see *Appendix-2*; antacids should not be taken half an hour before or after a dose

Side-effects: constipation; gastric discomfort reported

Dose: 2g twice daily (on rising and at bedtime) or 1g 4 times daily 1 hour before meals and at bedtime, taken for 4 weeks or in resistant cases up to 8 weeks; max. 8g daily

Proprietary Preparations

Gastalfet (*Beximco*), Tab. 500 mg, Tk. 4.02/Tab.

Antepsin (*Kemiko*), Tab. 1 gm, Tk. 5.50/Tab.

Ulsec (*Asiatic*), Tab. 1 gm, Tk. 4.00/Tab.

2.3.5 PROSTAGLANDIN ANALOGUES

Misoprostol, a synthetic analogue of prostaglandin E1 (alprostadiol) inhibits gastric acid secretion promoting healing of gastric and duodenal ulcer. It can protect against NSAID associated gastric ulcers but not dyspepsia.

MISOPROSTOL^[ED]

Indications: see notes above and under dose

Cautions: conditions where hypotension might precipitate severe complications (e.g. cerebrovascular disease, cardiovascular disease)

2. GASTRO-INTESTINAL SYSTEM

Contraindications: pregnancy or planning pregnancy (increases uterine tone). Should not be used in women of child-bearing age unless the patient requires NSAID therapy and is at high risk of NSAID induced ulceration; *patient must be advised of the risks of taking misoprostol if pregnant*

Interactions: see Appendix-2

Side-effects: diarrhoea (may be severe, reduced by giving single dose not exceeding 200 micrograms and by avoiding magnesium containing antacids); also reported: abdominal pain, dyspepsia, flatulence, nausea and vomiting, abnormal vaginal bleeding (including intermenstrual bleeding, menorrhagia, and post menopausal bleeding)

Dose: benign gastric and duodenal ulceration, 800 micrograms daily (in 2-4 divided doses) with breakfast (or main meals) and at bedtime; treatment should be continued for at least 4 weeks and may be continued for up to 8 weeks if required. Prophylaxis of NSAID induced peptic ulcer, 200 micrograms 2-4 times daily according to condition of patient

Proprietary Preparations

Cytomis (*Incepta*), Tab., 100 microgram, Tk. 8.00/Tab.; 200 microgram. Tk. 15.00/Tab.

G-Misoprostol (*Gonoshasthaya*), Tab., 200 microgram, Tk.10.00 /Tab.

Indula (*Renata*), Tab., 200 microgram, Tk. 15.00/Tab.

Isovent (*Square*), Tab., 200 microgram, Tk. 15.05/Tab.; 600 microgram., Tk. 40.00/Tab.

Misoclear (*Acme*), Tab., 200 microgram., Tk. 15.00/Tab.

Misopa (*Beximco*), Tab.,200 microgram., Tk. 15.00/Tab.

Misotec (*Sharif*), Tab., 200 microgram, Tk. 15.00/Tab.

Misotol (*Ziska*), Tab., 200 microgram, Tk. 15.00/Tab.

2.3.6 DRUGS FOR ERADICATION OF HELICOBACTER PYLORI

The causal role of *H. pylori* in gastric and duodenal ulcer is now widely accepted. Long-term healing of gastric and duodenal ulcers can be achieved by eradicating *H. pylori*, and after such

eradication the incidence of relapse decreases. Studies have shown that with *H. pylori* eradication only 5-10% patients experienced relapse within a year compared to 85% of patients who do not have *H. pylori* eradication, and the benefit appeared to continue for about 7 years. It is recommended that the presence of *H. pylori* be confirmed before starting eradication treatment.

One week's triple therapy containing a proton pump inhibitor (omeprazole) and clarithromycin with either metronidazole or amoxicillin produces eradication in over 90% of patients. Clarithromycin may be substituted with both metronidazole and amoxicillin. Ranitidine or bismuth chelate may be used in place of omeprazole. *Two weeks' triple therapy* regimen may give higher eradication rate but adverse effects are common and compliance is poor.

Recommended regimens for *H. pylori* eradication (7-day course)

Omeprazole 20 mg twice daily +
Clarithromycin 500 mg twice daily +
Amoxicillin 1 g twice daily

Lansoprazole 30 mg twice daily +
Clarithromycin 500 mg twice daily +
Amoxicillin 1 g twice daily

Omeprazole 20 mg twice daily +
Clarithromycin 500 mg twice daily +
Metronidazole 400 mg twice daily

Lansoprazole 30 mg twice daily +
Clarithromycin 500 mg twice daily +
Metronidazole 400 mg twice daily

Lansoprazole 30 mg twice daily+
Metronidazole 400 mg twice daily+
Amoxicillin 1 g twice daily

Omeprazole 20 mg twice daily +
Metronidazole 400 mg thrice daily +
Amoxicillin 500 mg thrice daily

Pantoprazole 40mg twice daily+
Clarithromycin 500mg twice daily+
Amoxicillin 1g twice daily

Ranitidine bismuth citrate 400 mg twice daily +
Clarithromycin 500mg twice daily + Amoxicillin
1 g twice daily

2. GASTRO-INTESTINAL SYSTEM

TRIPLE THERAPY COMBINED PREPARATIONS

Proprietary Preparations

Lansoprazole 30 mg + Clarithromycin 500 mg + Amoxicillin 1 g

Helicon Kit (General), Tab.Tk. 55.21/blister strip

Pylotrip (Square), Tab.Tk.55.00/blister strip

Pylopac (Beximco), Tab., Tk.45.00/blister strip

Omeprazole 20 mg + Clarithromycin 500mg + Metronidazole 500mg

Neo Kit (Beximco), Tab. Tk.55.00/ blister strip

Amoxicillin + Clarithromycin + Rabeprazole Sodium

Pylocure kit (Opsonin) Tab.Tk.48.56/blister strip

2.4 DRUGS FOR ACUTE DIARRHOEA

Diarrhoea is characterized by increased volume and frequency of liquid stools. It is commonly associated with infection, but may result from accumulation of non-absorbed osmotically active solute in gut such as in lactase deficiency, or when intestinal motility or morphology is altered. Diarrhoea is a symptom of gastroenteritis and of most intestinal infections. Although viral diarrhoeas are common, the severe forms of infectious diarrhoeas are generally due to bacterial pathogens such as *Campylobacter jejuni*, *Escherichia coli*, *Salmonella*, *Shigella* Spp., *Vibrio cholera* and *Yersinia enterocolitica*. Intestinal protozoa such as *E.histolytica* and *Giardia* also cause diarrhoea. The first line of treatment in acute diarrhoea is **oral rehydration therapy (ORT)**.

Acute diarrhoea may lead to excessive fluid and electrolyte loss and dehydration especially in infants and in elderly patients. It is potentially life threatening in infants and in frail and elderly persons. Severe dehydration associated with acute diarrhoea (greater than 10% loss of body-weight), requires intravenous rehydration therapy preferably with ringers letate solution. Intravenous therapy is also needed for patients who are unable to drink.

ORAL REHYDRATION THERAPY

Oral rehydration therapy (ORT) by correcting fluid and electrolyte depletion forms the basis of treatment for acute diarrhoea.

The solution of **oral rehydration salts (ORS)** containing essential electrolytes (sodium, potassium, chloride and bicarbonate or citrate) and glucose is indicated regardless of the age of the patient or the cause of the diarrhoea. The rationale for the use of glucose is that it promotes active transport of electrolytes. There is considerable evidence that cereal based solutions tend to produce more rapid resolution of diarrhoea and a **rice-based rehydration solution** (see below) are recommended for patients with cholera. Home remedies which have been used for oral rehydration include green coconut water, rice water, soups, weak tea and solution of various salts and sugars. The use of soft drinks with low pH and high osmolality may exacerbate diarrhoea. Severe dehydration (greater than 10% loss of body weight) requires intravenous rehydration therapy (see below).

Withholding food during diarrhoea in both children and adults is not recommended; feeding may decrease stool output and shorten duration of diarrhoea. Oral rehydration therapy should therefore be combined with normal dietary measures to avoid malnutrition. Breast-feeding should be continued throughout the rehydration therapy. A rehydration phase that involves the replenishment of fluid and electrolytes lost through diarrhoea is followed by a maintenance phase to replace continuing loss.

ORAL REHYDRATION SALTS^[ED]

Each sachet of the proprietary preparations contains: sodium chloride 1.75 g, potassium chloride 0.75 g, trisodium citrate dihydrate 1.45 g and anhydrous dextrose 10 g. This is the WHO approved formulation for ORS.

2. GASTRO-INTESTINAL SYSTEM

Contents of one sachet are dissolved in 500 ml of drinking water for ready use.

Proprietary Preparations

ACI ORS (*ACI*), ORS, Tk. 4.58/Sachet
Asaline (*Apex*), ORS, Tk. 4.58/Sachet
Easy ORS (*Central*), ORS, Tk. 4.58/Sachet
G-ORS (*Gonoshasthaya*), ORS, Tk. 4/Sachet
K-SALINE N (*Kemiko*), ORS, Tk. 4.58/Sachet
Neosaline (*Eskayef*), ORS, Tk. 4.58/Sachet
Oralsaline (*Albion*), ORS, Tk. 5.00/Sachet
Oralsaline Sweety (*Albion*) ORS, Tk. 5/Sachet
Orasol (*Sonear*), ORS, Tk. 3.20/Sachet
ORS (*Popular*), ORS, Tk. 4.58/Sachet
R-Saline N (*Rephco*), ORS, Tk. 4.50/Sachet
R-Saline (*Rephco*), ORS, Tk. 3.20/Sachet
Saline R (*Renata, Mirpur*), ORS, Tk. 4.58/Sachet
SOS (*Supreme*), ORS, Tk. 4.58/Sachet
SOS Plus Mango (*Supreme*), ORS, Tk. 5.00/Sachet
Super Saline (*Amico*), ORS, Tk. 4.57/Sachet
Unisaline Fruity (*Ibn Sina*), ORS, Tk. 5.00/Sachet
Unisaline (*Ibn Sina*), ORS, Tk. 4.58/Sachet
Zeosaline (*Sharif*), ORS, Tk. 4.58/Sachet
K-SALINE FRUITY (*Kemiko*), ORS, Tk. 5.00/Sachet

IV REHYDRATION THERAPY

Proprietary Preparations

Cholera Saline:

Usual strength for IV infusion, potassium chloride 0.1% sodium chloride 0.5% and sodium acetate 0.393%

Cholera Saline (*Opsosaline*), IV Infusion Tk. 69.94/500ml; Tk. 91.72/1000ml
Dianak (*Orion*), IV Infusion Tk.49.78/500ml Tk. 65.50/1000 ml
Diasol (*Libra*), IV Infusion TK. 52.60 /500ml; Tk. 65.74/100ml
Koloride (*Beximco*), IV Infusion Tk. 70.00 /500ml; Tk. 91.7/1000ml

CEREAL BASED ORS

It contains sodium chloride 3.5 g, potassium chloride 1.5 g, sodium bicarbonate 2.5 g and 50 g boiled rice powder to be dissolved in 1 litre of boiled drinking water.

Proprietary Preparations

Easy ORS Plus Saline (*Central*), ORS, Tk. 12.00/Sachet
Rice ORS (*Square*), ORS, Tk. 10.00/500 ml Sachet ;Tk. 6.00/250ml Sachet

Rice Saline (*General*), ORS, Tk. 15.00/500 ml Sachet, Tk. 9.00/250 ml Sachet
Neorice (*Eskayef*), ORS, Tk. 12.00/Sachet

ANTIDIARRHOEAL DRUGS WHICH REDUCE MOTILITY

In acute diarrhoeas fluid and electrolyte replacement are the prime requirements, especially in children. In chronic diarrhoeas opioids (such as codeine, diphenoxylate, and mixtures containing morphine or opium) are useful symptomatic treatments, but loperamide may be preferable as it is unlikely to cause dependence.

There are few side-effects associated with these drugs but, except in the case of loperamide, excessive sedation may occur in children and in patients with chronic liver disease. They should be used with caution in colitic attacks as they may possibly increase the risk of toxic megacolon. Prolonged use could possibly aggravate irritable bowel syndrome.

They should be used with caution in the elderly as they may induce faecal impaction, producing incontinence, spurious diarrhoea, abdominal pain, and rarely colonic obstruction.

LOPERAMIDE HYDROCHLORIDE

Indications: acute diarrhoea in adults and children over 4 years (*see notes above*); chronic diarrhoea in adults only

Side-effects: occasional rashes

Dose: acute diarrhoea, 4 mg initially followed by 2 mg after each loose stool for up to 5 days; usual dose 6-8 mg daily, max. 16 mg daily; CHILD 4-8 years 1 mg 4 times daily for up to 3 days only, 9-12 years 2 mg 4 times daily for up to 5 days

Chronic diarrhoea in adults, initially, 4-8 mg daily in divided doses, subsequently adjusted according to response and given in 2 divided doses for maintenance

Proprietary Preparations

Imotil (*Square*), Cap., 2 mg, Tk. 1.00/Cap.
Loperin (*Opsonin*), Cap., 2 mg, Tk. 0.75/Cap.

2. GASTRO-INTESTINAL SYSTEM

Lopamid (*Acme*), Cap., 2 mg, Tk. 1.00/Cap.

Nomotil (*Ziska*), Cap. 2 mg, Tk. 0.60/Cap.

2.5 DRUGS FOR CHRONIC DIARRHOEAS

Chronic diarrhoea may be associated with underlying diseases and therefore symptomatic relief is less appropriate than treatment of disease itself. Where the disease process responsible for chronic diarrhoea can not be satisfactorily suppressed, symptomatic relief with antimotility drugs such as **loperamide** or diphenoxylate with atropine may be appropriate. Bulk laxatives such as ispaghula (*Isop gul*), methylcellulose bran etc. have also been used for symptomatic treatment because of their absorptive capacity. Opioids with a central action (e.g. codeine) are better avoided because of the risk of dependence.

IRRITABLE BOWEL SYNDROME: This can present with pain, constipation, or diarrhoea, all of which may benefit from a high fibre diet with bran or other agents which increase stool bulk, if necessary. In some patients there may be important psychological aggravating factors, which respond to reassurance. Anti-diarrhoeal drugs such as loperamide may sometimes be necessary but prolonged use may aggravate the condition. Antispasmodics may relieve the pain.

INFLAMMATORY BOWEL DISEASES

Chronic inflammatory bowel diseases include ulcerative colitis and Crohn's disease. Drug treatment consists of **aminosalicylates** (sulphasalazine, mesalazine, balsalazine, olsalazine) and corticosteroids (hydrocortisone, budesonide and prednisolone). Maintenance of nutrition is important. Severe chronic active disease may require surgery.

MALABSORPTION SYNDROME : individual conditions need specific treatment and also general nutritional consideration. Thus coeliac disease (gluten enteropathy) usually needs a gluten free diet and pancreatic insufficiency needs pancreatic supplements.

ULCERATIVE COLITIS : for acute mild to moderate diseases affecting rectum or sigmoid colon, topical corticosteroid treatment such as prednisolone enemas or suppositories will induce remission; foam preparations are especially useful where patients have difficulty retaining liquid enemas. More extensive diseases may be treated with an aminosalicilate but may require oral corticosteroid treatment. Severe extensive or fulminant disease may need hospital admission, intravenous corticosteroid administration, intravenous fluid and electrolyte replacement and/or blood transfusion, parenteral nutrition and antibiotics.

Corticosteroids are unsuitable for maintenance treatment because of side-effects. **Sulphasalazine mesalazine and olsalazine** all have value in preventing relapse and choice is related in part to their different side-effects. In resistant cases **azathioprine** (see section 14.2.1) 2 mg/kg daily, given under close supervision may be helpful.

Laxatives are required to facilitate bowel movement when proctitis is present but a high fibre diet and bulk forming drugs such as methylcellulose or ispaghula (*Isop gul*) are more useful in adjusting faecal consistency.

Symptoms of mild ulcerative colitis may be relieved with antidiarrhoeal drugs such as codeine or loperamide but they should be used with caution in severe cases as paralytic ileus and toxic megacolon may be precipitated. For similar reasons antispasmodics should not be used in ulcerative colitis.

CROHN'S DISEASE: Treatment particularly of colonic diseases is similar to that for ulcerative colitis. In small bowel disease sulphasalazine is of doubtful value. Oral corticosteroids (e.g. prednisolone) suppress inflammation, and metronidazole may be beneficial possibly through antibacterial activity. Other antibacterials should be given if specifically indicated and for managing bacterial overgrowth in the small bowel. Infliximab, a monoclonal antibody inhibiting pro-inflammatory cytokines, and TNF-alpha has recently been

2. GASTRO-INTESTINAL SYSTEM

indicated for severe Crohn's disease refractory to corticosteroids, but may be associated with development of extrapulmonary tuberculosis.

In both colitis and Crohn's disease general nutritional care and appropriate supplements are essential. Cholestyramine and aluminium hydroxide mixture, bind unabsorbed bile salts and provide symptomatic relief of diarrhoea following ileal disease or resection, in bacterial colonisation of the small bowel and in post-vagotomy diarrhoea.

PSEUDOMEMBRANOUS COLITIS: This is due to colonisation of the colon with *Clostridium difficile* that may develop after antibiotic therapy. Ampicillin, clindamycin and lincomycin have been implicated most frequently but few antibiotics are free of this side-effect. It is usually of acute onset, but may run a chronic course. Oral vancomycin or metronidazole has been advocated as specific treatment.

DIVERTICULAR DISEASE: This is treated with a high fibre diet, bran supplements and bulk forming laxatives. Antispasmodics may provide symptomatic relief when colic is a problem. Antibiotics should be used only when the diverticula in the intestinal wall become infected. Antidiarrhoeal drugs which slow the intestinal motility (e.g. codeine, diphen-oxylate and loperamide) could possibly exacerbate the symptoms of diverticular disease and are therefore contra-indicated.

AMINOSALICYLATES

Sulphasalazine a chemical combination 5-aminosalicylic acid (5-ASA) and sulphapyridine, is useful in mild to moderate cases of ulcerative colitis and Crohn's disease. Newer agents include **olsalazine** (2 molecules of 5-aminosalicylic acid bonded together which separates in the lower bowel), **mesalazine** (5-aminosalicylic acid in slow release formulation) and **balsalazide** (a prodrug of 5-ASA). Unlike sulphasalazine these newer agents do

not have have sulphonamide related side-effects, but have their own side-effects profiles which include watery diarrhoea nausea, headache and hypersensitivity reactions. Olsalazine may cause watery diarrhoea. Rare side-effects include blood disorders, rashes and lupoid syndrome. 5-ASA should be used with caution during pregnancy and breast-feeding,

MESALAZINE

Indications: maintenance of remission in ulcerative colitis

Cautions: elderly, renal impairment, pregnancy and breast-feeding; avoid administration with lactulose

Contraindications: salicylate hypersensitivity; severe renal impairment

Side-effects: nausea, diarrhoea, and abdominal pain; headache; exacerbation of symptoms of colitis; rarely reversible pancreatitis; reversible myocarditis also reported

Dose: *by mouth*, 1.2-2.4 g daily in divided doses

Generic Preparation

ER Capsule, 250 mg; 500 mg

SULPHASALAZINE

Indications: induction and maintenance of remission in ulcerative colitis; treatment of active Crohn's disease

Cautions: pregnancy; hepatic and renal disease, glucose 6-phosphate dehydrogenase (G6PD) deficiency including breast-feeding of affected infants; slow acetylator status; withdraw treatment if blood disorders, hypersensitivity reactions, or other serious disorders occur; upper gastrointestinal side-effects are common with doses over 4g daily; blood counts, liver function, and rheumatoid arthritis, *see section 9.1.3*

Contraindications: salicylate and sulphonamide hypersensitivity; porphyria

Interactions: *see Appendix-2*

2. GASTRO-INTESTINAL SYSTEM

Side-effects: nausea, vomiting, epigastric discomfort, headache, rashes; occasionally, fever, minor haematological abnormalities such as Heinz body anaemia, reversible neutropenia, folate deficiency; reversible azospermia; rarely: pancreatitis, exacerbation of colitis, thrombo-cytopenia, agranulo-cytosis, Steven's-Johnson syndrome, neurotoxicity, photo-sensitisation, lupus erythematosus like syndrome, and pneumonitis; proteinuria and crystalluria; urine may be orange coloured; soft contact lenses may be stained

Dose: *by mouth*, acute attack 1-2 g 4 times daily (*but see Cautions*) until remission occurs (if necessary, corticosteroids may also be given), reducing to a maintenance dose of 500 mg 4 times daily; CHILD over 2 years, acute attack 40-60 mg/kg daily, maintenance dose 20-30 mg/kg daily

By rectum, as suppositories, alone or in conjunction with oral treatment 0.5-1 g morning and night after a bowel movement. As an enema, 3 g at night, retained for at least 1 hour.

Proprietary Preparations

Reumazin (*Aristo*), Tab. 500 mg, Tk. 5.20/Tab.

Sulfazin (*Popular*), Tab. 500 mg, Tk. 5.22/Tab.

Sulfacol (*Drug Int.*), Tab. 500 mg, Tk. 5/Tab.

Salazine (*Opsonin*), Tab. 500 mg, Tk. 3.92/Tab.; Supp. 500 mg, Tk. 7.52/Supp.;

2.6 LAXATIVES

- 2.6.1 Bulk forming drugs
- 2.6.2 Stimulant laxatives
- 2.6.3 Faecal softeners
- 2.6.4 Osmotic laxatives

Misconceptions about bowel habits have led to excessive laxative use. Abuse may lead to hypokalaemia and an atonic non-functioning colon. The intake of dietary fibre usually relieves simple constipation. The use of laxatives in children is undesirable and the introduction of fibre rich diet may be sufficient to regulate bowel action.

Laxatives should generally be avoided except where straining will exacerbate a condition (such as angina pectoris) or

increase the risk of rectal bleeding as in haemorrhoids. Laxatives are also of value in drug induced constipation, for the expulsion of parasites after anthelmintic treatment, and to clear the alimentary tract before surgery and radiological procedures. The laxatives that are used have been divided into 4 main groups.

2.6.1 BULK FORMING LAXATIVES

These relieve constipation by increasing faecal mass which stimulates peristalsis, but patients should be told that the full effect may take some days to develop. They are useful in the management of patients with colostomy, ileostomy, haemorrhoids, anal fissure, chronic diarrhoea associated with diverticular disease, irritable bowel syndrome, and ulcerative colitis. Adequate fluid intake must be maintained to avoid intestinal obstruction. Unprocessed rice or wheat bran, taken with food or fruit juice, is a most effective bulk forming preparation. Oat bran is also very good.

Methylcellulose ispaghula (*Isop gul*), and **sterculia** are useful in patients who cannot tolerate bran. Methylcellulose also acts as a faecal softener

ISPAGHULA HUSK

(*Isop Gul husk* or '*bhushi*')

Indications: *see notes above*

Cautions: adequate fluid intake should be maintained to avoid intestinal obstruction; ulcerative colitis.

Contraindications: intestinal obstruction, colonic atony, faecal impaction

Side-effects: flatulence, rarely abdominal distension

Dose: ADULT 3.5g in water twice daily preferably after meals; CHILD over 6 years half the adult dose

COUNSELING: preparations that swell in contact with liquid should always be carefully swallowed with water and should not be taken immediately before going to bed

Proprietary Preparation

Albi-Tasty Ispaghul (Albion), Powder 3.5 gm, Tk. 4.00/Sachet

LUBIPROSTONE

Indications: chronic constipation in adults, irritable bowel syndrome

Side effects: nausea, diarrhea, headache, flatulence

Contraindications: liver and kidney disease; chronic diarrhea, bowel obstruction, diarrhea-predominant IBS

Dose: 25 microgram twice daily to treat constipation; 8 microgram twice daily to treat IBS in women 18 years of age and older

Proprietary Preparation

Lubilax (Beacon), Cap., 8 microgram, Tk.15/Cap; 24 microgram, Tk. 40/Cap.

METHYL CELLULOSE

Indications: see notes above

Cautions; Contraindications; Side-effects; Counseling: see under *Ispaghula Husk*

Dose: 800-1600g twice daily with at least 300 ml water

Proprietary Preparation

Celulose (Acme), Tk.0.82/Tab.

2.6.2 STIMULANT LAXATIVES

The recognised stimulant laxatives include **bisacodyl** and members of the anthraquinone group, e.g. **senna** **Docusate sodium** probably, acts both as a stimulant and as a softening agent. Powerful stimulants such as **casacara** and **castor oil** are obsolete now-a-days. Stimulant laxative increases intestinal motility and often causes abdominal cramp. They should not be used in intestinal obstruction. Prolonged use can precipitate the onset of an atonic nonfunctioning colon and hypokalaemia. They should not be used in children.

Glycerol suppositories act as a rectal stimulant by virtue of their mildly irritant action. **Soft soap** is a stronger irritant; the use of soft soap enema should be

2. GASTRO-INTESTINAL SYSTEM

avoided, especially in pregnancy, as it may inflame the colonic mucosa.

The **parasympathomimetics** such as bethanechol distigmine, neostigmine and pyridostigmine enhance parasympathetic activity in the gut and increase intestinal motility. They are rarely used for their gastrointestinal effects but may be needed in cases of paralytic ileum, for example, postoperatively. Organic obstruction of the gut must first be excluded and they should be used with caution in bowel anastomosis.

BISACODYL

Indications: see under *Dose*; tablets act in 10-12 hours; suppositories act in 20-60 minutes

Cautions; Contraindications; Side-effects: see notes on *stimulant laxatives*; tablets, griping; suppositories, local irritation

Interactions: see *Appendix-2*

Dose: by mouth for constipation, 10 mg at night; occasionally necessary to increase to 15-20 mg; CHILD 5 mg

By rectal suppositories, for constipation 10 mg in the morning; CHILD 5 mg

Before radiological procedures and surgery, 10 mg by mouth at bedtime for 2 days before examination, and if necessary, a 10 mg suppository 1 hour before examination

Proprietary Preparations

Bisacodyl (Albion), Tab., 5 mg, Tk. 0.70/Tab.

Duralax (Opsonin), Tab., 5 mg, Tk. 0.53/Tab.

SENNA^[E]

Indications: constipation; bowel evacuation before abdominal radiological procedures, endoscopy, and surgery; acts in 8-12 hours

Cautions; Contraindications and Side-effects: see notes on *stimulant laxatives*

Proprietary Preparation

Laxenna (GSK), Tab. 12mg, Tk. 1.25/Tab.

2. GASTRO-INTESTINAL SYSTEM

2.6.3 FAECAL SOFTENERS

Liquid paraffin the classical lubricating agent, has disadvantages (see below). Bulk laxatives, non-ionic surfactant “wetting” agents e.g. docusate sodium, and glycerol suppositories also have softening properties. Such drugs are useful in the management of haemorrhoids and anal fissure.

Enemas containing 130 ml of **arachis oil** (ground-nut oil) would lubricate and soften impacted faeces and promote bowel movement. For children above 6 years, the dose has to be reduced in proportion to body-weight; not recommended for children under 6 years.

LIQUID PARAFFIN

Indication: constipation

Cautions: avoid prolonged use; should not be taken immediately before going to bed

Side-effects: anal seepage of paraffin and consequent anal irritation after prolonged use, granulomatous reactions caused by absorption of small quantities of liquid paraffin (especially from the emulsion), lipid pneumonia, and interference with the absorption of fat-soluble vitamins

Dose: by mouth 10-30 ml of the oral emulsion (see below) as required

Generic Preparation

Liquid Paraffin Oral Emulsion BP, Oral Emulsion, contains liquid paraffin 5 ml, vanillin 5 mg, chloroform 0.025 ml, benzoic acid solution 0.2 ml, methylcellulose-20 200 mg, saccharin sodium 500 micrograms, water to 10 ml.

Liquid Paraffin and Magnesium Hydroxide Oral Emulsion BP, Oral Emulsion, 25% liquid paraffin in aqueous suspension containing 6% hydrated magnesium oxide. **Dose:** for constipation, 5-20 ml as and when required.

Proprietary Preparations

Frelax (*Beximco*), Oral emulsion, Tk. 95/100ml
Magfin (*Incepta*), Oral emulsion Tk. 95/100ml
Nesifin (*Opsonin*), Oral emulsion, Tk. 83.57/100ml

2.6.4 OSMOTIC LAXATIVES

Osmotic laxatives are drugs, which act by retaining fluid in the bowel by the mechanism of osmosis. They may also act by changing the pattern of water distribution in the faeces.

Saline purgatives are commonly abused but for occasional use these are quite satisfactory. During their use, adequate fluid intake should be maintained. Where a rapid bowel evacuation is required, **magnesium sulphate** is still useful. This should be used in a dose before breakfast or on an empty stomach, followed by plenty of warm fluid. This treatment usually causes evacuation within 2 hours. **Magnesium hydroxide** is effective in mild constipation. But regular use of magnesium salts may be habit-forming. **Magnesium citrate** has been used for bowel evacuation before colonic surgery, colonoscopy, or radiological examinations to ensure that the bowel is free of solid or dark contents. Use of sodium salts should be avoided as they may cause sodium and water retention in susceptible individuals. In bowel clearance before endoscopy, radiological procedures and surgery, **phosphate enemas** are useful. A semi-synthetic disaccharide **lactulose**, produces osmotic diarrhoea of low faecal pH, and discourages the proliferation of ammonia producing organisms, but it is not absorbed from the gastrointestinal tract. It is therefore useful in the treatment of hepatic encephalopathy. **Lactitol** is a bulk sweetener/osmotic laxative

LACTITOL

Indications : to promote gut motility in chronic constipation

Proprietary Preparations

Laxitol (*Eskayef*), Powder, 10 gm, Tk. 12.00/Sachet; Oral Solu., 66.67 gm/100 ml, Tk. 65.00/50 ml; Tk. 120.00/100 ml
Maxilax (*Opsonin*), Powder, 10 gm, Tk. 9.02/Sachet
Sinalax (*Ibn Sina*), Powder, 10 gm, Tk. 13.00/Sachet

2. GASTRO-INTESTINAL SYSTEM

LACTULOSE

Indications: constipation (may take up to 48 hours to act), hepatic (portal systemic) encephalopathy

Contraindications: galactosaemia, intestinal obstruction

Interactions: see Appendix-2

Side-effects: flatulence, cramps, and abdominal discomfort

Dose: expressed in terms of an oral solution containing lactulose 3.35 g/5ml

Constipation, ADULT initially 15 ml twice daily, gradually reduced according to patient's needs; CHILD under 1 year 2.5 ml, 1-5 years 5 ml, 6-12 years 10 ml twice daily, gradually reduced

Hepatic encephalopathy, 30-50 ml 3 times daily, subsequently adjusted to produce 2-3 soft stools daily

Proprietary Preparations

Actilac (*Healthcare*), Oral Solu., 3.40 gm/5 ml, Tk. 125.00/100 ml; Tk. 230.00/200 ml

Asilac (*Asiatic*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml; Tk. 230.00/200 ml

Avolac (*Aristo*), Oral Solu., 3.40 gm/5 ml, Tk. 140.00/100 ml; Tk. 250.00/200 ml

Biose (*Bios*), Oral Solu., 3.40 gm/5 ml, Tk. 100.00/100 ml; Tk. 200.00/200 ml

Conlax (*Unimed*), Oral Solu., 3.40 gm/5 ml, Tk. 100.00/100 ml; Tk. 200.00/200 ml

D-Lac (*Drug Intl*), Oral Solu., 3.40 gm/5 ml, Tk. 70.00/50 ml; Tk. 120.00/100 ml; Tk. 220.00/200 ml

Ezylax (*Orion*), Oral Solu., 3.40 gm/5 ml, Tk. 50.19/50 ml; Tk. 100.38/100 ml

Glovolac (*Globex*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml

Inolac (*Incepta*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml

Laclose (*Opsonin*), Oral Solu., 3.40 gm/5 ml, Tk. 90.23/100 ml

Lactolax (*Pharmasia*), Oral Solu., 3.40 gm/5 ml, Tk. 100.00/100 ml

Lactu (*Biopharma*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml; Tk. 200.00/200 ml

Lactulose-H (*Hudson*), Oral Solu., 3.35gm/5ml, Tk.110.00/100 ml

Laxativ (*Rangs*), Oral Solu., 3.35gm/5ml, Tk. 100/100ml, Tk. 200/200ml

Laxol (*Navana*), Oral Solu., 3.40 gm/5 ml, Tk. 50.19/50 ml; Tk. 120.00/100 ml; Tk. 200.75/200 ml

Laxolac (*Globe*), Oral Solu., 3.40 gm/5 ml, Tk. 115.00/100 ml

Leaxe (*Alco*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml; Tk. 230.00/200 ml

Livax (*Pacific*), Oral Solu., 3.40 gm/5 ml, Tk. 105.26/100 ml; Tk. 187.97/200 ml

Livoton (*Kemiko*), Oral Solu., 3.40 gm/5 ml, Tk. 70.00/50 ml; Tk. 120.00/100 ml; Tk. 230.00/200 ml

Loctoz (*Amico*), Oral Solu., 3.40 gm/5 ml, Tk. 100.00/100 ml

Niprolac (*Nipro JMI*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml

Oralax (*Somatec*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml

Osmolax (*Square*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml; Tk. 230.00/200 ml

Premesis (*Globe*), Oral Solu., 3.40 gm/5 ml, Tk. 15.00/100 ml

Regulose (*General*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml; Tk. 200.75/200 ml

Serelose (*Beximco*), Oral Solu., 3.40 gm/5 ml, Tk. 130.00/100 ml

Sinalac (*Ibn Sina*), Oral Solu., 3.40 gm/5 ml, Tk. 70.00/60 ml; Tk. 120.00/100 ml; Tk. 230.00/200 ml

Sivolac (*Sharif*), Oral Solu., 3.40 gm/5 ml, Tk. 100.00/100 ml

Softner (*Rephco*), Oral Solu., 3.40 gm/5 ml, Tk. 75.00/100 ml; Tk. 125.00/200 ml

Tulac (*Eskayef*), Oral Solu., 3.40 gm/5 ml, Tk. 65.00/50 ml; Tk. 120/100 ml; Tk. 230/200 ml

Tulos (*Acme*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml

Veelac (*Albion*), Oral Solu., 3.40 gm/5 ml, Tk. 100.00/100ml; Tk. 195.00/200ml

Xylose (*Delta*), Oral Solu., 3.40 gm/5 ml, Tk. 120.00/100 ml

MAGNESIUM HYDROXIDE^[E^D]

Indications: mild constipation (acts in 2-4 hours)

Cautions: use only occasionally; the elderly; renal impairment; hepatic impairment

Contraindication: intestinal obstruction

Interactions: see Appendix-2 (Antacids and absorbents)

Dose: aqueous suspension containing about 8% hydrated magnesium oxide, 25-50 ml as and when required

Generic Preparations

Magnesium Hydroxide Mixture BP (Cream of Magnesia), Oral Suspension containing about 8% hydrated magnesium oxide

Liquid Paraffin and Magnesium Hydroxide Oral Emulsion BP see under *Liquid Paraffin* (sec. 2.6.3)

2. GASTRO-INTESTINAL SYSTEM

Proprietary Preparations

ACME's Milk of Magnesia (*Acme*), Susp., Tk. 60.00/114 ml

Magmil (*Pacific*), Susp., Tk. 45.11/100 ml; Tk. 75.19/200 ml

Magnason (*Jayson*), Susp., Tk. 50.00/100 ml

Milk of Magnesia (*Maks*), Susp., Tk. 25/114 ml

MOM (*Opsonin*), Susp., Tk. 45.11/100 ml

MAGNESIUM SULPHATE^[ED]

Indications: rapid bowel evacuation (acts in 2-4 hours when given by mouth); injection preparation is used in *eclampsia* and *pre eclampsia*. (see section 16.2.2.3)

Cautions; Contraindications: see under *Magnesium Hydroxide*; hepatic impairment

Side-effects: nausea, bloating, abdominal cramps (usually transient reduced by taking more slowly); rarely vomiting, anal irritation; urticaria, rhinorrhoea and dermatitis reported

Dose: for rapid bowel evacuation (in 2-4 hours), 5-10 g in a glassful of water preferably before breakfast.

Proprietary Preparation

Nalepsin (*Beximco*), Inj., (IV infusion) 4% Tk. 70.80/100ml

POLY ETHYLENE GLYCOL (Macrogol)

Indications: chronic constipation

Caution, Contraindications: see under *Magnesium hydroxide*; breast feeding, pregnancy; cardiovascular impairment

Side-effects: flatulence, cramps, and abdominal discomfort

Dose: see preparation below

Proprietary Preparation

Aqualax (*Incepta*), Susp., 17g/240ml, Tk. 120/240ml

Dose: chronic constipation, ADULT and CHILD over 12 years, 25mL 1-3 times daily usually for up to 2 weeks; maintenance, 25mL 1-2 times daily

2.7 PREPARATIONS FOR HAEMORRHOIDS

2.7.1 SOOTHING HAEMORRHOIDAL PREPARATIONS

2.7.2 COMPOUND HAEMORRHOIDAL PREPARATIONS WITH CORTICOSTEROIDS

2.7.3 RECTAL SCLEROSANTS

2.7.4 OTHER PREPARATIONS

Anal and perianal pruritus, soreness, and excoriation are best treated by application of bland ointments, suppositories or dusting powders. These conditions occur commonly in patients suffering from haemorrhoids, fistulas, and proctitis. Careful local toilet, as well as, adjustment of the diet to avoid hard stools, taking of bulk forming materials such as bran (section 2.6.1) and a high residue diet are also helpful. In proctitis these measures may supplement treatment with corticosteroids or sulphasalazine.

When necessary topical preparations containing local anaesthetics or corticosteroids are used provided perianal thrush has been excluded. Perianal thrush is best treated with nystatin by mouth and by local application.

2.7.1 SOOTHING HAEMORRHOIDAL PREPARATIONS

Bland soothing preparations containing mild astringents such as bismuth subgallate zinc oxide and hamamelis may give symptomatic relief in haemorrhoids. Many proprietary preparations also contain lubricants vasoconstrictors or mild antiseptics. Prolonged application of preparations containing resorcinol should be avoided because it may interfere with thyroid function. Heparinoids are claimed to promote the resorption of local oedema and extravasated blood.

Local anaesthetics are used to relieve pain associated with haemorrhoids anal fissure, and pruritus but good evidence is lacking. Lignocaine gel and ointment

2. GASTRO-INTESTINAL SYSTEM

are best applied on a plastic dilator which ensures contact with the base of the fissure. Alternative local anaesthetics include amethocaine, cinchocaine, and pramoxine, but they are more irritant.

Local anaesthetics should be used for short periods only (no longer than 1-2 weeks) since they may cause sensitisation of the anal skin.

ADMINISTRATION. Unless otherwise indicated a suppository is usually inserted into the rectum at night and morning or after a bowel movement. Rectal ointments and creams are applied at night and morning or after a bowel movement, externally by rectum using a rectal nozzle.

Note. Local anaesthetic ointments can be absorbed through the rectal mucosa therefore excessive application should be avoided, particularly in infants and children.

2.7.2 COMPOUND PREPARATIONS WITH CORTICOSTEROIDS

Corticosteroids are often combined with antiseptics, antibiotics, local anaesthetics and soothing agents. They are suitable for occasional short term use after exclusion of infections, such as herpes simplex; see section 12.3 for general comments on topical corticosteroids.

Antibiotics may do little more than encourage the growth of resistant bacteria and should be avoided.

Proprietary Preparations

Cinchocaine HCl 0.5% + Hydrocortisone 0.5% + Neomycin sulphate 1% + Esculin 1%:

Anustat (Beximco), Rectal Oint., Tk.70.00/15g.

Anorel (Popular), Rectal Oint., Tk.80.30/15g

Erian (Square), Supp Tk.8/supp; Rectal

Ointment, Tk. 68.00/15g

Methovate (Gaco), Rectal Ointment, Betamethasone Valerate 0.05% + Lignocaine Hydrochloride 2.5% Tk.30.00/15gm

2.7.3 RECTAL SCLEROSANTS

Oily phenol injection is used to inject haemorrhoids particularly when those are unprolapsed.

PHENOL

Indications: injection of hemorrhoids

Side-effects: irritation, tissue necrosis

Dose: 2-3 ml of oily phenol injection into the submucosal layer at the base of the pile; several injections may be given at different sites, max. total injected 10 ml at any one time

Generic Preparation

Oily Phenol Injection BP, contains phenol 5% in a suitable fixed oil

2.7.4 OTHER PREPARATIONS

DIOSMIN WITH HESPERIDIN

Indications: treatment of organic and idiopathic chronic venous insufficiency of the lower limbs with the following symptoms: heavy legs; pain; nocturnal cramps. Treatment of hemorrhoids and acute hemorrhoidal attacks

Side effects: some cases of minor gastrointestinal and autonomic disorders have been reported, but these never required cessation of treatment

Dose: in venous disease: 2 tablets daily. In acute hemorrhoidal attacks: the dosage can be increased up to 6 tablets daily as prescribing information may vary from country to country.

Proprietary Preparations

Diosmin 450mg with Hesperidin 50mg

Daflon[®] (Servier), Tk.12/Tab

Diohes (Opsonin), Tk. 8/Tab

Hemorif (Square), Tk. 8/Tab

Normalan (Renata), Tk. 8/Tab

2.8 DRUGS AFFECTING INTESTINAL SECRETIONS

2.8.1 DRUGS ACTING ON THE GALL BLADDER

2.8.2 PANCREATIN

2.8.1 DRUGS ACTING ON THE GALL BLADDER

The bile acids **chenodeoxycholic acid** and **ursodeoxycholic acid** are used in selected patients to dissolve cholesterol gallstones as an alternative to surgery.

2. GASTRO-INTESTINAL SYSTEM

They are only suitable for patients who have mild symptoms, unimpaired gall bladder function, and small or medium sized radiolucent stones; they are not suitable for radio opaque stones, which are unlikely to be dissolved. Patients should preferably be supervised in hospital because radiological monitoring is required. Long term prophylaxis may be needed after complete dissolution of the gallstones has been confirmed (preferably with cholecystograms and ultrasound on two separate occasions) as gallstones may recur in up to 25% of patients within one year of stopping treatment.

Dehydrocholic acid is used to improve biliary drainage by stimulating the secretion of thin watery bile. It is given after surgery of the biliary tract to flush the common duct and drainage tube and wash away small calculi obstructing flow through the common bile duct but its value has not been established.

URSODEOXYCHOLIC ACID

Indication: dissolution of cholesterol rich gallstone, primary biliary cirrhosis

Cautions: see notes above

Contra-indications: chronic liver disease, peptic ulcer disease, non-functioning gall bladder, inflammatory bowel disease, pregnancy, radio-opaque stone and other conditions of the small intestine, colon and liver which interfere with entero-hepatic circulation of bile salts

Interactions: see Appendix-2

Side-effects: nausea, vomiting, diarrhea and other gastrointestinal disturbance, gallstone calcification; pruritus.

Dose: dissolution of gallstone, 8-12mg/kg daily as a single dose at bedtime or in two divided doses; for up to 2 years; treatment is continued for 3-4 months after stones dissolve. Primary biliary cirrhosis 10-15mg/kg daily in 2-4 divided doses.

Proprietary Preparations

Leveric (*Beximco*), Tab., 150 mg, Tk.11/Tab.; 300 mg, Tk. 20/Tab.;

Liconor (*Opsonin*), Tab., 150 mg, Tk. 8.30/Tab.; 300 mg, Tk. 15.10/Tab.;Syrup 250 mg/5 ml, Tk. 135.85/100 ml

Livacor (*Albion*), Tab.,150 mg, Tk. 10.00/Tab.; 300 mg, Tk. 20.00/Tab.

Oxycol (*Unimed*), Tab., 150 mg, Tk. 20/Tab.; 300 mg, Tk. 36.00/Tab.

Udca (*Biopharma*), Tab., 150 mg, Tk. 20/Tab.

Udihep (*Mundipharma*), Tab., 150 mg, Tk. 12.67/Tab.; S.R Tab. 300 mg, Tk. 23.50/Tab.

Uliv (*Acme*), Tab., 150 mg, Tk. 12.05/Tab., Tab. 250mg , Tk. 20.07/Tab.

Ursocol (*Sun*), Tab., 150 mg, Tk. 11.05/Tab.; Tab., Tk. 20.10/Tab.

Ursodil (*General*),Tab.,300mg, Tk. 20.07/Tab.

Ursolic (*Drug Int.*), Tab.,150 mg, Tk.11/Tab.; 300 mg, Tk. 20/Tab.

2.8.2 PANCREATIN

Supplements of pancreatin are given by mouth to compensate for reduced or absent exocrine secretion in cystic fibrosis, and following pancreatectomy, total gastrectomy, or chronic pancreatitis. They assist the digestion of starch, fat, and protein.

Pancreatin is inactivated by gastric acid; therefore pancreatin preparations are best taken with food (or immediately before or after food). Gastric acid secretion may be reduced by giving cimetidine or ranitidine an hour beforehand. Con-current use of antacids also reduces gastric acidity. The newer enteric coated preparations enclosing enteric coated granules (or minitabets) can deliver a higher enzyme concentration in the duodenum provided these are swallowed whole without chewing.

Pancreatin may irritate the skin around mouth and anus, particularly if preparations are retained in the mouth or dosage is excessive. Hypersensitivity reactions occur occasionally and may affect those handling the powder.

Dosage is adjusted according to size, needs and number/consistency of stools, so that the patient thrives; extra allowance may be needed if heavy snacks are taken between meals.

Proprietary Preparations

A-Zyme (*Acme*), Tab., 325 mg, Tk. 3.50/Tab.

Crezyme (*Opsonin*),Tab., 325 mg, Tk.1.88/Tab

Suzyme (*Square*),Tab., 325 mg, Tk. 2.50/Tab.

Zymet (*Beximco*), Tab., 325 mg, Tk. 3/Tab.