agement of colostomies or ileostomies to reduce the volume of discharge.

In **acute diarrhoea** the usual initial dose for adults is loperamide hydrochloride 4 mg followed by 2 mg after each loose stool to a maximum of 16 mg daily; the usual daily dose is 6 to 8 mg. In the UK, it is not licensed for children under 4 years of age. Suggested doses for older children are: 4 to 8 years, 1 mg three or four times daily for up to 3 days; 9 to 12 years, 2 mg four times daily for up to 5 days. In the USA, loperamide is not recommended for children under the age of 2 years and an initial dose of 1 mg three times daily is suggested for children aged 2 to 5 years. (For restrictions on the use of loperamide in children and the view that antidiarrhoeal drugs should not be used at all in children, see Diarrhoea, below.)

In **chronic diarrhoea** the usual initial dose for adults is 4 to 8 mg daily in divided doses subsequently adjusted as necessary; doses of 16 mg daily should not be exceeded. If no improvement has been seen after treatment with 16 mg daily for at least 10 days, further use is unlikely to be of benefit. Although not licensed for use in children for chronic diarrhoea, in the UK the *BNFC* allows for the following oral doses of loperamide hydrochloride:

- 1 month to 1 year: 100 to 200 micrograms/kg twice daily, given 30 minutes before feeds; up to a maximum of 2 mg/kg daily in divided doses may be required
- 1 to 12 years: 100 to 200 micrograms/kg (maximum dose 2 mg) three to four times daily; up to 1.25 mg/kg daily in divided doses may be required, to a maximum of 16 mg daily
- 12 to 18 years: 2 to 4 mg two to four times daily, to a maximum of 16 mg daily

Loperamide is also given as the prodrug, **loperamide oxide**, which is converted to loperamide in the gastrointestinal tract. It has been given for acute diarrhoea in doses of 2 to 4 mg initially followed by 1 mg after each loose stool, to a maximum of 8 mg daily.

Diarrhoea. The mainstay of treatment for acute diarrhoea (p.1694) is rehydration therapy. Antidiarrhoeals may have a role for symptomatic relief in adults with acute diarrhoea, and loperamide is often chosen in such circumstances,[1] but WHO does not recommend the use of *any* antidiarrhoeal drug in children with diarrhoea. Similarly, in the UK the *BNFC* considers that antimotility drugs are not to be recommended for acute diarrhoea in children under 12 years of age. There have been problems regarding the use of antidiarrhoeals such as loperamide in young children in developing countries. Manufacturers have considered that a lower age limit is acceptable in those countries than is recommended in the UK or USA; even that lower limit is not always observed in practice and there have been reports of serious toxicity in very young children.[2] In response to such reports the manufacturers withdrew concentrated drops of loperamide worldwide and the syrup from countries where the WHO had a programme for control of diarrhoeal diseases,[3] but tablets and capsules remain available. In some countries the use of antidiarrhoeals is now restricted by law.

In the UK, NICE states that loperamide is the antidiarrhoeal of first choice in adults with faecal incontinence;[4] it can be used long-term in doses from 500 micrograms to 16 mg daily as needed. Loperamide should be started at a very low dose which can be increased as needed, and then adjusted in response to stool consistency. It should not be given to those with hard or infrequent stools, those with acute diarrhoea of unknown cause, or with acute ulcerative colitis. Patients who are unable to tolerate loperamide may be offered codeine phosphate (p.37) or co-phenotrope (see Diphenoxylate Hydrochloride, p.1724).

For mention of the use of loperamide in the management of diarrhoea caused by chemotherapy, see p.640.

1. Wingate D, *et al.* Guidelines for adults on self-medication for the treatment of acute diarrhoea. *Aliment Pharmacol Ther* 2001; **15:** 773–82.
2. Bhutta TI, Tahir KI. Loperamide poisoning in children. *Lancet* 1990; **335:** 363.
3. Gussin RZ. Withdrawal of loperamide drops. *Lancet* 1990; **335:** 1603–4.
4. NICE. Faecal incontinence: the management of faecal incontinence in adults (issued June 2007). Available at: http://www.nice.org.uk/nicemedia/pdf/CG49NICEGuidance.pdf (accessed 31/03/08)

PRODRUG THERAPY. References to the use of *loperamide oxide* in diarrhoea.

1. Van Den Eynden B, *et al.* New approaches to the treatment of patients with acute, nonspecific diarrhea: a comparison of the effects of loperamide and loperamide oxide. *Curr Ther Res* 1995; **56:** 1132–41.
2. Hughes IW, *et al.* First-line treatment in acute non-dysenteric diarrhoea: clinical comparison of loperamide oxide, loperamide and placebo. *Br J Clin Pract* 1995; **49:** 181–5.
3. van Outryve M, Toussaint J. Loperamide oxide for the treatment of chronic diarrhoea in Crohn's disease. *J Int Med Res* 1995; **23:** 335–41.
4. Sun WM, *et al.* Effects of loperamide oxide on gastrointestinal transit time and anorectal function in patients with chronic diarrhoea and faecal incontinence. *Scand J Gastroenterol* 1997; **32:** 34–8.

Preparations

BP 2008: Loperamide Capsules;
USP 31: Loperamide Hydrochloride Capsules; Loperamide Hydrochloride Oral Solution; Loperamide Hydrochloride Tablets.

Proprietary Preparations (details are given in Part 3)
Arg.: Colifilm; Contem; Custey; Dotalsec; Elcoman; Ionet; Lansek A; Lefa Enteril L; Minicam; Plexol; Plorinoc; Regulane; Salvaxil†; Suprasec; Viltar; ***Austral.:*** Chemists Own Diarrhoea Relief; Gastro-Stop; Harmonise; Imodium; Neogastro†; ***Austria:*** Enterobene; Imodium; Lopedium; Normakut; ***Belg.:*** Imodium; ***Braz.:*** Diafuran; Diarresec†; Diasec†; Imosec; Loperin; Magnostase; ***Canad.:*** Anti-Diarrheal; Diahalt†; Diarr-Eze; Diarrhoea Relief; Imodium; Loperacap; ***Chile:*** Capent; Coliper; Lopediar; ***Cz.:*** Dissenten; Imodium; Loperon; ***Denm.:*** Dialope; Imodium; Propiden; Travello†; ***Fin.:*** Imocur; Imodium; Lopex†; ***Fr.:*** Altocel†; Arestal; Diaretyl; Dyspagon; Ercestop; Imodium; Imodiumlingual; Imossel; Indiaral; Nabutil†; ***Ger.:*** Azuperamid†; Boxolip; duralopid; Endialop; Endiaron†; Imodium; Lop-Dia; Lopalind; Lopedium; Lopepham†; Lopera akut†; Loperhoe; ***Gr.:*** Imodium; Neo-Enteroseptol; ***Hong Kong:*** Colodium†; Diatabs Reformulated; Imodium; Imodonl; Loper; Loperamil; Loperax; Loperium; Lopermide†; Mar-Loper; Reximide; Synodium; Vacontil†; Vidaperamide; ***Hung.:*** Enterobene; Imodium; Lopedium; Loperacap; ***India:*** Diarlop; Lopamide; Roko; ***Indon.:*** Alphamid; Amerol; Antidia; Colidium; Diadium; Diasec; Imodium; Imomed; Imore; Imosa; Inamid; Lexadium; Lodia; Loremid; Motilex; Normotil; Normudal; Opox; Oramide; Primodium; Renamid; Xepare; Zeroform; ***Irl.:*** Arret; Diarrest RF; Imodium; ***Israel:*** Imodium; Loperid; Loperium; Rekamide; Shilshul X; Stopit; ***Ital.:*** Diarstop; Diarzero; Dissenten; Imodium; Lopemid; Ramidox†; Tebloc†; ***Malaysia:*** Beamodium; Diatrol†; Imocap†; Imodium; Imotab†; Loperax†; Lopenium; Lopermide; Loramide; Miraton†; Vacontil; ***Mex.:*** Acanol; Acqta; Apo-Pera; Biolid†; Cryoperacid; Deroser; Dialacid†; Diaperol; Dilostop†; Exclefin; F9†; Hurplex; Imodium; Lomotil; Lop; Nodiamex; Permidal; Pramidal; Raxamida†; Rediarin; Top-Dal; Valfam; ***Neth.:*** Arestal; Diacure; Diarem; Imodium; Kruidvat Diarreeremmer; Trekpleister Diarreeremmer†; ***Norw.:*** Imodium; Travello; ***NZ:*** Diamide; Dicap; Imodium; Nodia; ***Philipp.:*** Diamide; Diaperyl; Diatabs (Reformulated); Imodium; Lormide; Tymedon; ***Pol.:*** Imodium; Laremid; Stoperan; ***Port.:*** Dyspagon; Fulcalrex; Imodium; Loprex; Loride; ***Rus.:*** Imodium (*Имодиум*); Lopedium (*Лопедиум*); ***S.Afr.:*** Betaperamide; Gastron; Imodium; Lenide-T; Lopedium; Loperastat; Norimode; Prodium; ***Singapore:*** Colodium†; IMD†; Imodium; Loperamil; Lopermide; Loramide†; Lorpa; Vacontil; ***Spain:*** Elissan; Fortasec; Imodium; Imosec†; Loperan; Loperkey; Protector; Salvacolina; Taguinol; ***Swed.:*** Dimor; Imodium; Primodium; Travello; ***Switz.:*** Binaldan; Imodium; Lopimed; Zorotop; ***Thai.:*** Diarent; Diarodil; Entermid; Imodium; Impelium; Lomide; Lomy†; Lopaminе†; Lopela; Lopercin; Loperdium; Loperia; Lopermide; Operium†; Perasian; SBOB†; ***Turk.:*** Diadef; Lopermid; ***UK:*** Arret; Diah-Limit; Diaquitte; Diareze; Diocalm Ultra; Diocaps; Entrocalm; Imodium; Norimode; Normaloe; ***USA:*** Imodium; K-Pek II; Kao-Paverin; Kaopectate II†; Neo-Diaral; Pepto Diarrhea Control; ***Venez.:*** Glucitol; Imodium; Loperam; Mentaden†; Oldan†; Polonit†.

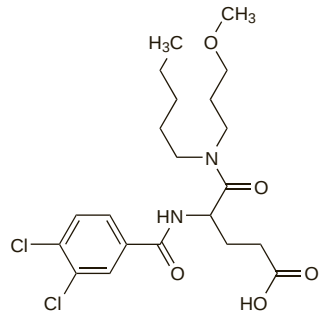
Multi-ingredient: ***Arg.:*** Neo Kef; Neomas L; Regulane AF; ***Austral.:*** Imodium Advanced; ***Austria:*** Imodium Plus; ***Belg.:*** Imodium Plus; ***Braz.:*** Imodium Plus†; ***Canad.:*** Imodium Advanced; ***Cz.:*** Imodium Plus; ***Denm.:*** Imodium med Simethicon; ***Fr.:*** Imodiumduo; ***Ger.:*** Imodium Plus; ***Hong Kong:*** Imodium Plus; ***Hung.:*** Imodium Komplett†; ***Mex.:*** Imodium Plus; ***NZ:*** Imodium Advanced; ***Pol.:*** Imodium Plus; ***Port.:*** Imodium Plus; ***S.Afr.:*** Imodium Plus; ***Spain:*** Imodium Plus; ***Switz.:*** Imodium Plus; ***Thai.:*** Imodium Plus; ***UK:*** Imodium Plus; ***USA:*** Imodium Advanced.

Loxiglumide *(rINN)*

CR-1505; CR-2017 (dexloxiglumide); Loxiglumida; Loxiglumidum. (±)-4-(3,4-Dichlorobenzamido)-*N*-(3-methoxypropyl)-*N*-pentylglutaramic acid.

Локсиглумид

$C_{21}H_{30}Cl_2N_2O_5$ = 461.4.
CAS — 107097-80-3 (loxiglumide); 119817-90-2 (dexloxiglumide).



Profile

Loxiglumide is a specific cholecystokinin antagonist related to proglumide (see p.1764), and has been investigated in biliary and gastrointestinal dyskinesias, constipation and irritable bowel syndrome, and pancreatitis.

The *R*-isomer of loxiglumide, dexloxiglumide is also under investigation for constipation-predominant irritable bowel syndrome.

◊ References.

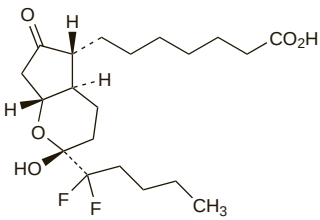
1. Shiratori K, *et al.* Clinical evaluation of oral administration of a cholecystokinin-A receptor antagonist (loxiglumide) to patients with acute, painful attacks of chronic pancreatitis: a multicenter dose-response study in Japan. *Pancreas* 2002; **25:** e1–e5.
2. Cremonini F, *et al.* Effect of CCK-1 antagonist, dexloxiglumide, in female patients with irritable bowel syndrome: a pharmacodynamic and pharmacogenomic study. *Am J Gastroenterol* 2005; **100:** 652–63.
3. Persiani S, *et al.* Pharmacokinetic profile of dexloxiglumide. *Clin Pharmacokinet* 2006; **45:** 1177–88.

Lubiprostone *(USAN, rINN)*

Lubiprostona; Lubiprostonum; RU-0211; SPI-0211. (–)-7-[(2*R*,4a*R*,5*R*,7a*R*)-2-(1,1-Difluoropentyl)-2-hydroxy-6-oxooctahydrocyclopenta[*b*]pyran-5-yl]heptanoic acid.

Лубипростон

$C_{20}H_{32}F_2O_5$ = 390.5.
CAS — 136790-76-6; 333963-40-9.



Adverse Effects and Precautions

The most common adverse effect of lubiprostone is nausea, which is dose-dependent and may be severe in some patients. Symptoms can be reduced by taking lubiprostone with food. Diarrhoea also occurs commonly, and other gastrointestinal effects include abdominal distension and pain, flatulence, and vomiting. Other reported adverse effects include headache, dizziness, fatigue, dyspnoea, and peripheral oedema. Chest discomfort, back pain, and arthralgia can occur.

Lubiprostone is contra-indicated in patients with a history of mechanical gastrointestinal obstruction.

Pharmacokinetics

A negligible amount of lubiprostone is absorbed systemically after an oral dose. It is rapidly and extensively metabolised by carbonyl reductase, probably in the stomach and jejunum.

Uses and Administration

Lubiprostone is a chloride-channel activator that acts locally in the gut to increase intestinal fluid secretion, which increases motility. It is used in the treatment of chronic idiopathic constipation (p.1693) in a dose of 24 micrograms twice daily, taken orally with food. It is also under investigation in the treatment of constipation-predominant irritable bowel syndrome.

◊ References.

1. McKeage K, *et al.* Lubiprostone. *Drugs* 2006; **66:** 873–9.
2. Anonymous. Lubiprostone (Amitiza) for chronic constipation. *Med Lett Drugs Ther* 2006; **48:** 47–8.
3. Ambizas EM, Ginzburg R. Lubiprostone: a chloride channel activator for treatment of chronic constipation. *Ann Pharmacother* 2007; **41:** 957–64.

Preparations

Proprietary Preparations (details are given in Part 3)
USA: Amitiza.

Magaldrate *(BAN, USAN, rINN)*

Aluminum Magnesium Hydroxide Sulfate; AY-5710; Magaldraatti; Magaldrát; Magaldrat; Magaldratas; Magaldrato; Magaldratum.

Магальдрат

$Al_5Mg_{10}(OH)_{31}(SO_4)_2,xH_2O$ = 1097.3 (anhydrous).
CAS — 74978-16-8.
ATC — A02AD02.
ATC Vet — QA02AD02.

NOTE. Magaldrate was formerly described as Aluminium Magnesium Hydroxide ($AlMg_2(OH)_7$ monohydrate, *CAS—1317-26-6*).

Pharmacopoeias. In *Eur.* (see p.vii) and *US*.

Ph. Eur. 6.2 (Magaldrate). A combination of aluminium and magnesium hydroxides (see p.1706 and p.1743 respectively) and sulfates. It contains the equivalent of 90 to 105% of $Al_5Mg_{10}(OH)_{31}(SO_4)_2$, calculated with reference to the dried substance. A white or almost white crystalline powder. Practically insoluble in water and in alcohol; soluble in dilute mineral acids. It loses between 10 and 20% of its weight on drying at 200° for 4 hours.

USP 31 (Magaldrate). A combination of aluminium and magnesium hydroxides and sulfates. It contains the equivalent of 90 to

105% of $Al_5Mg_{10}(OH)_{31}(SO_4)_2$, calculated on the dried basis. A white odourless crystalline powder. Insoluble in water and in alcohol; soluble in dilute solutions of mineral acids. It loses between 10 and 20% of its weight on drying at 200° for 4 hours.

Profile
Magaldrate is an antacid (see p.1692) that is given in oral doses of up to about 2 g.

Preparations
BP 2008: Magaldrate Oral Suspension;
USP 31: Magaldrate and Simethicone Oral Suspension; Magaldrate and Simethicone Tablets; Magaldrate Oral Suspension; Magaldrate Tablets.

Proprietary Preparations (details are given in Part 3)
Arg.: Riopan; ***Austria:*** Riopan; ***Belg.:*** Gastricalm; Riopan; ***Braz.:*** Riopan; ***Cz.:*** Marax†; ***Fr.:*** Riopan; ***Ger.:*** Gastripan; Gastrostad†; Glysan; Hevert-Mag; Magastron; Marax; Riopan; Simaphil; ***Gr.:*** Felfar; Riopan; ***Ital.:*** Gadral; Magaltop; Magralibi; Riopan; ***Pol.:*** Malugastrin; ***Port.:*** Riopan; ***Rus.:*** Magalphil (Магалфил); ***S.Afr.:*** Riopone; ***Spain:*** Bemolan; Gastromol; Magion; Minoton; ***Switz.:*** Riopan; ***USA:*** Iosopan; Riopan; ***Venez.:*** Cremag.

Multi-ingredient: ***Arg.:*** Aci-Tip; Carbogasol Antiacido†; ***Austral.:*** Mylanta Heartburn Relief†; ***Braz.:*** Riopan Plus; ***Chile:*** Aci-Tip†; Antiax; ***Hong Kong:*** Nilcid-MPS†; ***India:*** Maglid; pH4; Rolac Plus; Ulgel†; ***Indon.:*** Asidrat; Magalat; Nudramag; ***Mex.:*** Nilcid†; Riopan; ***Spain:*** Compagel†; ***Turk.:*** Asidopan Plus; Simelgat Plus; ***UK:*** Bisodol Extra; Bisodol Heartburn Relief; ***USA:*** Iosopan Plus; Lowsium Plus; Riopan Plus; ***Venez.:*** Cremalon.

Magnesium Carbonate

Bázisos magnézium-karbonát; E504; Magnesii Carbonas; Magnesii subcarbonas; Magnesio, carbonato de; Magnésium, carbonate de; Magnesiumsubkarbonaatti; Magnesiumsubkarbonat; Magnezu węglan; Magnezyum Karbonate; Magnio subkarbonatas; Uhličitan hořečnatý zásaditý.

Магния Карбонат

CAS — 546-93-0 (anhydrous magnesium carbonate); 23389-33-5 (hydrated normal magnesium carbonate); 39409-82-0 (hydrated basic magnesium carbonate).

ATC — A02AA01; A06AD01.

ATC Vet — QA02AA01; QA06AD01.

Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), *Jpn*, *US*, and *Viet.* Some pharmacopoeias include a single monograph that permits both the light and heavy varieties while some have 2 separate monographs for the 2 varieties.

Ph. Eur. 6.2 (Magnesium Carbonate, Heavy; Magnesii Subcarbonas Ponderosus). A hydrated basic magnesium carbonate containing the equivalent of 40 to 45% of MgO. A white or almost white powder. 15 g has an apparent volume before settling of not more than 60 mL. Practically insoluble in water; dissolves in dilute acids with strong effervescence.

Ph. Eur. 6.2 (Magnesium Carbonate, Light; Magnesii Subcarbonas Levis). A hydrated basic magnesium carbonate containing the equivalent of 40 to 45% of MgO. A white or almost white powder. 15 g has an apparent volume before settling of at least 100 mL. Practically insoluble in water; dissolves in dilute acids with strong effervescence.

USP 31 (Magnesium Carbonate). A basic hydrated magnesium carbonate or a normal hydrated magnesium carbonate containing the equivalent of 40.0 to 43.5% of MgO. It is an odourless, bulky white powder or light, white, friable masses. Practically insoluble in water; insoluble in alcohol; dissolves in dilute acids with effervescence.

Profile
Magnesium carbonate is an antacid with general properties similar to those of magnesium hydroxide (below) that is given in oral doses of up to about 500 mg. When given orally, it reacts with gastric acid to form soluble magnesium chloride and carbon dioxide in the stomach; the carbon dioxide may cause flatulence and eructation. Magnesium carbonate is often given with aluminium-containing antacids such as aluminium hydroxide, which counteract its laxative effect.

Magnesium carbonate may be used as a magnesium supplement. It is also used as a food additive.

Preparations
BP 2008: Aromatic Magnesium Carbonate Mixture; Compound Magnesium Trisilicate Oral Powder; Kaolin Mixture; Magnesium Sulphate Mixture; Magnesium Trisilicate Mixture;
USP 31: Alumina and Magnesium Carbonate Oral Suspension; Alumina and Magnesium Carbonate Tablets; Alumina, Magnesium Carbonate, and Magnesium Oxide Tablets; Calcium and Magnesium Carbonates Oral Suspension; Calcium and Magnesium Carbonates Tablets; Magnesium Carbonate and Citric Acid for Oral Solution; Magnesium Carbonate and Sodium Bicarbonate for Oral Suspension; Magnesium Carbonate, Citric Acid, and Potassium Citrate for Oral Solution; Magnesium Citrate Oral Solution.

Proprietary Preparations (details are given in Part 3)
Arg.: Polvo Roge; ***Austria:*** Magnofit; ***Fr.:*** Mag 2; Mag 2 Junior; Sargemag; ***Ger.:*** Biolectra Magnesium 365; Palmicol; ***Gr.:*** Limonata Citromagnes; ***Hung.:*** Magnosolv; ***Ital.:*** Magnofit; ***Pol.:*** Additiva Magnesium; Magnezin; ***S.Afr.:*** Be-Lax; ***Switz.:*** Magnesium Nutrimed; ***USA:*** Mag-Carb.

Multi-ingredient: numerous preparations are listed in Part 3.

Used as an adjunct in: ***Arg.:*** Bufferin†; Dristan Analgesico†; Dristan Compuesto; ***Braz.:*** Bufferin; Somalgin; ***Canad.:*** Aspirin with Stomach Guard; Bufferin; Tri-Buffered ASA; ***Ital.:*** Bufferin†; ***USA:*** Adprin-B; Bufferin; Buffex; Extra Strength Bayer Plus.

Magnesium Citrate

Magnesii citras; Magnesio, citrato de; Magnésium, citrate de.

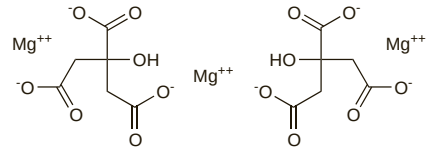
Магний Цитрат

$C_{12}H_{10}Mg_3O_{14}$ = 451.1.

CAS — 3344-18-1.

ATC — A06AD19; A12CC04; B05CB03.

ATC Vet — QA06AD19; QA12CC04; QB05CB03.



Pharmacopoeias. In *Eur.* (see p.vii) and *US*.

Ph. Eur. 6.2 (Magnesium Citrate, Anhydrous). A white or almost white, fine, slightly hygroscopic powder. Soluble in water; practically insoluble in alcohol. It dissolves in dilute hydrochloric acid. Store in non-metallic, airtight containers.

USP 31 (Magnesium Citrate). A 5% suspension in water has a pH of 5.0 to 9.0. Store in airtight containers.

Profile
Magnesium citrate is an osmotic laxative (p.1693) used as a bowel evacuant before investigational procedures or surgery of the colon. Dosages have ranged from about 11 to 25 g of magnesium citrate. In the UK, an aqueous solution containing magnesium citrate is prepared from a sachet (*Citramag*) containing about 11.6 g of magnesium carbonate and about 17.8 g of anhydrous citric acid by mixing with 200 mL of hot water. After the solution has cooled, one dose (the contents of one sachet) is taken by mouth at 8 a.m. the day before the procedure, and a second dose between 2 and 4 p.m. For doses in children, see below. A high fluid intake and low residue diet are needed with such bowel preparations. Magnesium citrate is also used with sodium picosulfate, p.1771.

Magnesium citrate is given as a magnesium supplement in doses of up to about 1.9 g daily by mouth.

For the general properties of magnesium salts, see p.1678.

Administration in children. The *BNFC* recommends the following oral doses of magnesium citrate (*Citramag*) for use as a bowel cleanser in children, to be taken on the day before the procedure:

- 5 to 10 years: ⁄ of a sachet at 8 a.m. and ⁄ of a sachet between 2 and 4 p.m.
- 10 to 18 years: ⁄ to 1 sachet at 8 a.m. and ⁄ to 1 sachet between 2 and 4 p.m.

For reconstitution directions, see above.

Migraine. For mention of the use of magnesium supplementation, including magnesium citrate, for the prophylaxis of migraine, see p.1681.

Preparations
USP 31: Magnesium Citrate for Oral Solution.

Proprietary Preparations (details are given in Part 3)
Arg.: Holomagnesio; Limonada Roge; ***Austral.:*** Mag Cit Prep†; ***Austria:*** Magnesium Diasporal; Magnofit; ***Belg.:*** Magnetop†; ***Canad.:*** Citro-Mag; Mag-Citrate; ***Cz.:*** Magnesium Diasporal†; Magnesolt†; ***Ger.:*** Magnesium Diasporal; Magnesium Verla N; Presselin Heilozon P†; ***Hong Kong:*** Citro-Mag†; ***Hung.:*** Magnesium Diasporal†; ***Pol.:*** Magnesol; ***Switz.:*** Magnegon; Magnesium Biomed; Magnesium Diasporal; Magnesium-Sandoz; ***UK:*** Citramag; ***USA:*** Evac-Q-Mag.

Multi-ingredient: ***Arg.:*** Holomagnesio B6; Magnebe; Total Magnesiano B6; ***Austral.:*** Go Kit; Go Kit Plus†; ***Austria:*** Magnosolv; ***Belg.:*** Carbobel; ***Canad.:*** Royvac Kit; ***Chile:*** Laxogeno; ***Fr.:*** Citrocholine; Magne-B ; ***Ger.:*** Acidovert†; Lithurex S†; Magnerot N; ***Gr.:*** Magnesium Sandoz; ***Hung.:*** Beres Magnezium + B ; Magurlit†; Pregmag; ***Irl.:*** Picolax; ***Ital.:*** Pomag; ***Spain:*** Salmagne; ***UK:*** CitraFleet; Picolax.

Magnesium Hydroxide

E528; Hydroxid hořečnatý; Magnesii hydroxidum; Magnesio, hidróxido de; Magnesium Hydrate; Magnésium, hydroxyde de; Magnesiumhydroksidi; Magnesiumhydroxid; Magnézium-hidroxid; Magnezyum Hidroksit; Magnio hidroksidas.

Магния Гидроксид

$Mg(OH)_2$ = 58.32.

CAS — 1309-42-8.

ATC — A02AA04; G04BX01.

ATC Vet — QA02AA04; QG04BX01.

NOTE. Compounded preparations of magnesium hydroxide may be represented by the following names:

- Co-magaldrox *x/y* (*BAN*)—where *x* and *y* are the strengths in milligrams of magnesium hydroxide and aluminium hydroxide respectively.

Pharmacopoeias. In *Eur.* (see p.vii), *Int.*, *US*, and *Viet.*

Ph. Eur. 6.2 (Magnesium Hydroxide). A fine white or almost white amorphous powder. Practically insoluble in water; dissolves in dilute acids. A solution in water is alkaline to phenolphthalein.

USP 31 (Magnesium Hydroxide). A bulky white powder. Practically insoluble in water, in alcohol, in chloroform, and in ether; soluble in dilute acids. Store in airtight containers.

Adverse Effects, Treatment, and Precautions
As for magnesium salts in general, see p.1679. Magnesium hydroxide may cause diarrhoea, an effect that is dose-dependent. Hypermagnesaemia may occur, usually in patients with renal impairment.

Hypermagnesaemia. There have been reports of hypermagnesaemia in infants given magnesium-containing antacids,[1-3] and in an adult patient with normal renal function but bowel obstruction.[4]

1. Brand JM, Greer FR. Hypermagnesemia and intestinal perforation following antacid administration in a premature infant. *Pediatrics* 1990; **85:** 121–4.
2. Alison LH, Bulugahapitiya D. Laxative induced magnesium poisoning in a 6 week old infant. *BMJ* 1990; **300:** 125.
3. Sullivan JE, Berman BW. Hypermagnesemia with lethargy and hypotonia due to administration of magnesium hydroxide to a 4-week-old infant. *Arch Pediatr Adolesc Med* 2000; **154:** 1272–4.
4. Laughlin SA, McKinney PE. Antacid-induced hypermagnesemia in a patient with normal renal function and bowel obstruction. *Ann Pharmacother* 1998; **32:** 312–15.

Interactions
As outlined on p.1692, antacids, including magnesium salts, interact with many other drugs both by alterations in gastric pH and emptying, and by formation of complexes that are not absorbed. Interactions can be minimised by giving the antacid and any other medications 2 to 3 hours apart.

Pharmacokinetics
Magnesium hydroxide, given orally, reacts relatively rapidly with hydrochloric acid in the stomach to form magnesium chloride and water. About 30% of the magnesium ions are absorbed from the small intestine, as described for Magnesium Salts, p.1680.

Uses and Administration
Magnesium hydroxide is an antacid (see p.1692) that is given in oral doses of up to about 1 g. It is often given with aluminium-containing antacids such as aluminium hydroxide which counteract its laxative effect.

Magnesium hydroxide is also given as an osmotic laxative (p.1693) in oral doses of about 2 to 5 g.

Magnesium hydroxide has also been used as a food additive and as a magnesium supplement in deficiency states.

Preparations
BP 2008: Co-magaldrox Oral Suspension; Co-magaldrox Tablets; Liquid Paraffin and Magnesium Hydroxide Oral Emulsion; Magnesium Hydroxide Mixture;
USP 31: Alumina and Magnesia Oral Suspension; Alumina and Magnesia Tablets; Alumina, Magnesia, and Calcium Carbonate Oral Suspension; Alumina, Magnesia, and Calcium Carbonate Tablets; Alumina, Magnesia, and Simethicone Oral Suspension; Alumina, Magnesia, and Simethicone Tablets; Alumina, Magnesia, Calcium Carbonate, and Simethicone Tablets; Aspirin, Alumina, and Magnesia Tablets; Calcium Carbonate and Magnesia Tablets; Calcium Carbonate, Magnesia, and Simethicone Tablets; Magnesia Tablets; Magnesium Hydroxide Paste; Milk of Magnesia.

Proprietary Preparations (details are given in Part 3)
Arg.: Leche de Magnesia Phillips; Magnesia San Pellegrino; ***Braz.:*** Leite de Magnesia de Phillips; Leite de Magnesia†; Magnesiol†; Mylanta Plus; ***Canad.:*** Milk of Magnesia; Phillips' Magnesia Tablets; Phillips' Milk of Magnesia; ***Chile:*** Leche de Magnesia Phillips; Magnesia Pasteur; Tabletas Antiacidas; ***Denm.:*** Magnesia; ***Fin.:*** Emgesan; Magnesiamaito; ***Fr.:*** Carbonex; Magnesie S Pellegrino†; ***Gr.:*** Milk of Magnesia; ***Hung.:*** Antagel M; ***India:*** Tricaine-MPS; ***Indon.:*** Laxasium; ***Irl.:*** Milk of Magnesia; ***Israel:*** Magnesia S Pellegrino; Milk of Magnesia; ***Ital.:*** Citrato Espresso S. Pellegrino; Magnesia S Pellegrino; Magnesia Volta†; ***Mex.:*** Leche de Magnesia Normex; ***Port.:*** Leite Magnesia Phillips; Magnesia San Pellegrino; ***S.Afr.:*** Babys own Tummy Tablets; Deopens†; ***Spain:*** Magnesia; Magnesia San Pellegrino; ***Swed.:*** Emgesan; ***Switz.:*** Magnesia S Pellegrino; ***Thai.:*** Milk of Magnesia; ***Turk.:*** Magcine; Magnesie Calcinee; Magnesium Naneli Lafar; Magnokal; ***UK:*** Milk of Magnesia; ***USA:*** Dulcolax; Milk of Magnesia; Pedia-Lax; Phillips' Chewable; Phillips' Milk of Magnesia; ***Venez.:*** Magnesia San Pellegrino.

Multi-ingredient: numerous preparations are listed in Part 3.

Used as an adjunct in: ***Canad.:*** C2 with Codeine†; ***Denm.:*** Kodamid; Kodimagnyl; Magnyl; ***Gr.:*** Ascriptin†; ***Indon.:*** Naspro; Rheumapill; ***Israel:*** Ascriptin†; ***Ital.:*** Ascriptin; Aspirina 03; ***Mex.:*** Ascriptin; ***USA:*** Arthritis Pain Formula; Ascriptin; Asprimox; Cope; Magnaprin†; Vanquish; ***Venez.:*** Ascriptin.