Pharmacokinetics

Clopidogrel is rapidly but incompletely absorbed after oral doses; absorption appears to be at least 50%. It is a prodrug and is extensively metabolised in the liver, mainly to the inactive carboxylic acid derivative; metabolism is mediated by the cytochrome P450 isoenzymes CYP3A4 and CYP2B6, and to a lesser extent by CYP1A2, CYP1A1, and CYP2C19. The active metabolite appears to be a thiol derivative; it has been identified *in vitro* but appears to be too unstable to be isolated from plasma. Clopidogrel and the carboxylic acid derivative are highly protein bound. Clopidogrel and its metabolites are excreted in urine and in faeces; about 50% of an oral dose is recovered from the urine and about 46% from the faeces.

Uses and Administration

Clopidogrel is a thienopyridine antiplatelet drug used in thromboembolic disorders. It is an analogue of ticlopidine (p.1411) and acts by inhibiting adenosine diphosphate-mediated platelet aggregation. It is given prophylactically as an alternative to aspirin in patients with atherosclerosis who are at risk of thromboembolic disorders such as myocardial infarction (p.1175), peripheral arterial disease (p.1178), and stroke (p.1185). Clopidogrel is also used with aspirin in acute coronary syndromes, including acute myocardial infarction and unstable angina (p.1157), and in coronary stenting (see Reperfusion and Revascularisation Procedures, below).

Clopidogrel is given orally as the bisulfate, but doses are expressed in terms of the base; 97.86 mg of clopidogrel bisulfate is equivalent to 75 mg of base.

For the **prophylaxis of thromboembolic events**, the usual dose of clopidogrel is 75 mg once daily.

In the management of **acute ST-elevation myocardial infarction**, clopidogrel is used with aspirin as an adjunct in medically-treated patients. It is given in a dose of 75 mg once daily; patients under 75 years of age may be given a loading dose of 300 mg. Treatment should be continued for at least 4 weeks.

In the management of **unstable angina** and **non-Q-wave myocardial infarction**, clopidogrel is used with aspirin as an adjunct to either medical or interventional treatment, including coronary stenting. A single loading dose of 300 mg is given, followed by 75 mg once daily.

◊ Reviews.

1. Sharis PJ, *et al.* The antiplatelet effects of ticlopidine and clopidogrel. *Ann Intern Med* 1998; **129:** 394–405.
2. Jarvis B, Simpson K. Clopidogrel: a review of its use in the prevention of atherothrombosis. *Drugs* 2000; **60:** 347–77.
3. Solet DJ, *et al.* The role of adenosine 5′-diphosphate receptor blockade in patients with cardiovascular disease. *Am J Med* 2001; **111:** 45–53.
4. Zambahari R, *et al.* Clinical use of clopidogrel in acute coronary syndrome. *Int J Clin Pract* 2007; **61:** 473–81.
5. Eshaghian S, *et al.* Role of clopidogrel in managing atherothrombotic cardiovascular disease. *Ann Intern Med* 2007; **146:** 434–41.
6. Plosker GL, Lyseng-Williamson KA. Clopidogrel: a review of its use in the prevention of thrombosis. *Drugs* 2007; **67:** 613–46.

Administration in children. Clopidogrel is not licensed for paediatric use in either the UK or the USA, although it has been given to small numbers of patients.

A retrospective study[1] of the use of clopidogrel in 15 children aged from 6 weeks to 16 years, 14 of whom had congenital heart disease, found that it was safe and effective; nearly all of the children were also taking aspirin and/or anticoagulants, and severe bleeding was reported in only 1 of them. The usual dose ranged from 1 to 3 mg/kg once daily, although a dose of 6 mg/kg daily was tolerated when given in error to 1 patient. A cohort study[2] of the use of clopidogrel alone or with aspirin in 17 children aged 1.5 to 17 years with arterial ischaemic stroke found that a daily dose of 0.5 to 2.4 mg/kg (target dose 1 mg/kg) was well tolerated, although subdural haematomas developed in 2 patients who were also taking aspirin.

1. Finkelstein Y, *et al.* Clopidogrel use in children. *J Pediatr* 2005; **147:** 657–61.
2. Soman T, *et al.* The risks and safety of clopidogrel in pediatric arterial ischemic stroke. *Stroke* 2006; **37:** 1120–2.

Atherosclerotic disorders. The use of aspirin to reduce the risk of cardiovascular events in patients with atherosclerotic vascular disorders is well established. Clopidogrel may have a role as an alternative. The CAPRIE trial[1] compared clopidogrel with aspirin in 19 185 patients at risk of ischaemic events, and found that clopidogrel reduced the risk of ischaemic stroke, myocardial infarction, or death from vascular causes to a greater extent than aspirin, although the absolute difference was small.

In acute coronary syndromes, clopidogrel may provide benefit when used in addition to aspirin. In patients with *unstable angina or non-ST elevation myocardial infarction*, the CURE trial[2] found that the risk of cardiovascular death, myocardial infarction, or stroke was lower in patients treated with clopidogrel and aspirin, compared with those receiving aspirin alone. Clopidogrel was given in a loading dose of 300 mg, started within 24 hours of the onset of symptoms, followed by 75 mg daily for 3 to 12 months.

Similar results have been reported in patients with acute *ST-elevation myocardial infarction*. Clopidogrel given with aspirin and thrombolytic therapy improved the patency of the affected artery and reduced the incidence of ischaemic complications at 30 days,[3] while a further study[4] found that addition of clopidogrel to aspirin and standard therapy (including thrombolytics in over half of the patients) also reduced early mortality.

Use of clopidogrel with aspirin has also been studied in *ischaemic stroke* but any benefit appears to be outweighed by an increased risk of bleeding. In the MATCH study,[5] adding aspirin to clopidogrel did not reduce the incidence of vascular events compared with clopidogrel alone, but the risk of major or life-threatening bleeding was increased. Similarly, in the CHARISMA study in patients with *stable atherosclerotic disease or multiple risk factors*, addition of clopidogrel to aspirin had no significant effect on the incidence of cardiovascular events, but the risk of moderate to severe bleeding was increased.[6]

1. CAPRIE Steering Committee. A randomised, blinded, trial of clopidogrel versus aspirin in patients at risk of ischaemic events (CAPRIE). *Lancet* 1996; **348:** 1329–39.
2. The Clopidogrel in Unstable Angina to Prevent Recurrent Events Trial Investigators. Effects of clopidogrel in addition to aspirin in patients with acute coronary syndromes without ST-segment elevation. *N Engl J Med* 2001; **345:** 494–502. Correction. *ibid.*; 1716.
3. Sabatine MS, *et al.* for the CLARITY-TIMI 28 Investigators. Addition of clopidogrel to aspirin and fibrinolytic therapy for myocardial infarction with ST-segment elevation. *N Engl J Med* 2005; **352:** 1179–89.
4. COMMIT (ClOpidogrel and Metoprolol in Myocardial Infarction Trial) collaborative group. Addition of clopidogrel to aspirin in 45 852 patients with acute myocardial infarction: randomised placebo-controlled trial. *Lancet* 2005; **366:** 1607–21.
5. Diener H-C, *et al.* Aspirin and clopidogrel compared with clopidogrel alone after recent ischaemic stroke or transient ischaemic attack in high-risk patients (MATCH): randomised, double-blind, placebo-controlled trial. *Lancet* 2004; **364:** 331–7.
6. Bhatt DL, *et al.* CHARISMA Investigators. Clopidogrel and aspirin versus aspirin alone for the prevention of atherothrombotic events. *N Engl J Med* 2006; **354:** 1706–17.

Reperfusion and revascularisation procedures. Percutaneous coronary intervention (PCI) has an established role in the management of both acute and stable coronary disease (see p.1181). Adjunctive antiplatelet therapy is given to reduce the risk of thrombosis, both during and after the procedure; a regimen of clopidogrel with aspirin improves outcomes[1] and is now generally recommended,[2,3] particularly if coronary stents are used. Although ticlopidine with aspirin was used initially in patients receiving stents, clopidogrel appears to be as effective as ticlopidine[4,5] but has a lower risk of haematological toxicity and is now generally preferred. A randomised study (CLASSICS)[6] found that, in patients given long-term aspirin, clopidogrel in a dose of 75 mg daily for 28 days, with or without a 300-mg loading dose, was as effective as ticlopidine; it was also better tolerated.

Pretreatment with clopidogrel appears to be most effective, but the increased bleeding risk may be of concern if emergency surgery is required. Use of a 300-mg loading dose shortly before the procedure appears to be safe, but efficacy may be reduced if it is given less than 6 hours before the intervention, and there is some evidence that it needs to be given at least 15 hours before.[7] A higher dose of 600 mg may be effective if given at least 2 hours before PCI,[8,9] and has been recommended in patients undergoing PCI for non-ST elevation acute coronary syndromes.[2]

The duration of combination therapy depends on the clinical situation. For patients given bare-metal stents, clopidogrel in a dose of 75 mg daily is usually given with aspirin for 2 to 4 weeks, and aspirin is then continued indefinitely. In patients with drug-eluting stents, the risk of occlusion persists for longer and combination therapy is usually recommended for at least 3 to 6 months; there is some evidence[10-12] that extending the duration further may provide additional benefit, and treatment for 12 months or longer has been suggested.[3] Prolonged combination therapy may also be of benefit in patients undergoing PCI for unstable angina, whether or not they receive stents.[1]

1. Mehta SR, *et al.* Effects of pretreatment with clopidogrel and aspirin followed by long-term therapy in patients undergoing percutaneous coronary intervention: the PCI-CURE study. *Lancet* 2001; **358:** 527–33.
2. Harrington RA, *et al.* Antithrombotic therapy for non-ST-elevation acute coronary syndromes: American College of Chest Physicians evidence-based clinical practice guidelines (8th edition). *Chest* 2008; **133** (suppl): 670S–707S.
3. Becker RC, *et al.* The primary and secondary prevention of coronary artery disease: American College of Chest Physicians evidence-based clinical practice guidelines (8th edition). *Chest* 2008; **133** (suppl): 776S–814S.
4. Mishkel GJ, *et al.*. Clopidogrel as adjunctive antiplatelet therapy during coronary stenting. *J Am Coll Cardiol* 1999; **34:** 1884–90.
5. Berger PB. Clopidogrel versus ticlopidine after intracoronary stent placement. *J Am Coll Cardiol* 1999; **34:** 1891–4.
6. Bertrand ME, *et al.* Double-blind study of the safety of clopidogrel with and without a loading dose in combination with aspirin compared with ticlopidine in combination with aspirin after coronary stenting: the Clopidogrel Aspirin Stent International Cooperative Study (CLASSICS). *Circulation* 2000; **102:** 624–9.
7. Steinhubl SR, *et al.* The CREDO Investigators. Optimal timing for the initiation of pre-treatment with 300 mg clopidogrel before percutaneous coronary intervention. *J Am Coll Cardiol* 2006; **47:** 939–43.
8. Longstreth KL, Wertz JR. High-dose clopidogrel loading in percutaneous coronary intervention. *Ann Pharmacother* 2005; **39:** 918–22.
9. Hochholzer W, *et al.* Time dependence of platelet inhibition after a 600-mg loading dose of clopidogrel in a large, unselected cohort of candidates for percutaneous coronary intervention. *Circulation* 2005; **111:** 2560–4.
10. Zimarino M, *et al.* Optimal duration of antiplatelet therapy in recipients of coronary drug-eluting stents. *Drugs* 2005; **65:** 725–32.
11. Steinhubl SR, *et al.* Early and sustained dual oral antiplatelet therapy following percutaneous coronary intervention: a randomized controlled trial. *JAMA* 2002; **288:** 2411–20. Correction. *ibid.* 2003; **289:** 987.
12. Eisenstein EL, *et al.* Clopidogrel use and long-term clinical outcomes after drug-eluting stent implantation. *JAMA* 2007; **297:** 159–68.

Preparations

USP 31: Clopidogrel Tablets.

Proprietary Preparations (details are given in Part 3)
Arg.: Antiplaq; Clodian; Clodrel†; Iscover; Nabratin; Nefazan; Plavix; Pleyar; Troken; ***Austral.:*** Iscover; Plavix; ***Austria:*** Plavix; ***Belg.:*** Plavix; ***Braz.:*** Iscover; Plavix; ***Canad.:*** Plavix; ***Chile:*** Artevil; Iskimil; Plavix; ***Cz.:*** Iscover; Plavix; ***Denm.:*** Plavix; ***Fin.:*** Plavix; ***Fr.:*** Plavix; ***Ger.:*** Iscover; Plavix; ***Gr.:*** Iscover; Plavix; ***Hong Kong:*** Plavix; ***Hung.:*** Plavix; ***India:*** Cloflow; Clopact; Clopivas; Clopod; Noklot; Plavix; ***Indon.:*** Plavix; ***Irl.:*** Plavix; ***Israel:*** Plavix; ***Ital.:*** Iscover†; Plavix; ***Malaysia:*** Plavix; ***Mex.:*** Iscover; Plavix; ***Neth.:*** Iscover; Plavix; ***Norw.:*** Plavix; ***NZ:*** Plavix; ***Philipp.:*** Plavix; ***Pol.:*** Areplex; Plavix; Zyllt; ***Port.:*** Iscover†; Plavix; ***Rus.:*** Plavix (Плавикс); Zillt (Зилт); ***S.Afr.:*** Plavix; ***Singapore:*** Plavix; ***Spain:*** Iscover; Plavix; ***Swed.:*** Plavix; ***Switz.:*** Plavix; ***Thai.:*** Plavix; ***Turk.:*** Plavix; ***UK:*** Plavix; ***USA:*** Plavix; ***Venez.:*** Plavix.

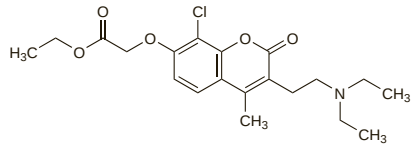
Multi-ingredient: ***Arg.:*** Nefazan Compuesto; ***India:*** Cloflow Plus†; Clopact A; Clopivas AP; Clopod-A.

Cloricromen *(rINN)*

Cloricromène; Cloricromeno; Cloricromenum. Ethyl ({8-chloro-3-[2-(diethylamino)ethyl]-4-methyl-2-oxo-2*H*-1-benzopyran-7-yl}oxy)acetate.

Клорикромен

$C_{20}H_{26}ClNO_5$ = 395.9.
CAS — 68206-94-0.
ATC — B01AC02.
ATC Vet — QB01AC02.



Profile

Cloricromen is an antiplatelet drug with vasodilating activity and is used in thromboembolic disorders (p.1187). It is given as the hydrochloride in arterial vascular disorders where there is a risk of thrombosis. It may be given orally in a dose of 100 mg two or three times daily or intravenously in a dose of 30 mg daily.

Preparations

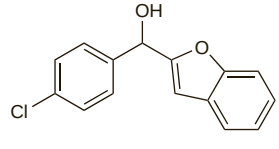
Proprietary Preparations (details are given in Part 3)
Ital.: Proendotel.

Cloridarol *(rINN)*

Clobenfurol; Cloridarolum. α-(Benzofuran-2-yl)-α-(4-chlorophenyl)methanol.

Клоридарол

$C_{15}H_{11}ClO_2$ = 258.7.
CAS — 3611-72-1.
ATC — C01DX15.
ATC Vet — QC01DX15.



Profile
Cloridarol is a vasodilator that has been used in ischaemic heart disease.

Colesevelam Hydrochloride

(USAN, rINNM)

Colésévélam, Chlorhydrate de; Colesevelami Hydrochloridum; GT31-104HB; Hidrocloruro de colesevelam. Allylamine polymer with epichlorohydrin (1-chloro-2,3-epoxypropane), [6-(allylamino)hexyl]trimethylammonium chloride and *N*-allyldecylamine, hydrochloride.

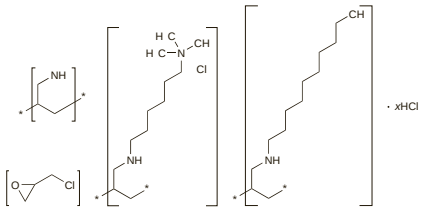
Колезевелама Гидрохлорид

$(C_3H_7N)_m(C_3H_5ClO)_n(C_{12}H_{27}ClN_2)_o(C_{13}H_{27}N)_p.xHCl$.

CAS — 182815-44-7.

ATC — C10AC04.

ATC Vet — QC10AC04.



Adverse Effects and Precautions
As for Colestyramine, p.1252.

Interactions
Colesevelam, like colestyramine (see p.1253), has the potential to interfere with the absorption of other drugs; those with a narrow therapeutic range should be given at least 1 hour before or 4 hours after colesevelam unless there is known to be no interaction.

◊ References.

1. Donovan JM, *et al.* Drug interactions with colesevelam hydrochloride, a novel, potent lipid-lowering agent. *Cardiovasc Drugs Ther* 2000; **14:** 681–90.

Uses and Administration
Colesevelam hydrochloride is a nonabsorbable hydrogel. It binds bile acids in the intestine and has actions similar to those of colestyramine (p.1253). It is used for the treatment of hypercholesterolaemia (p.1169), particularly type IIa hyperlipoproteinaemia, either alone or with a statin. It may also be used as an adjunct to improve glycaemic control in type 2 diabetes mellitus (p.431). The usual oral dose is 3.75 g daily, as a single dose or in two divided doses, with meals. When used as monotherapy for hypercholesterolaemia, the dose may be increased to 4.375 g daily if required. When used with a statin, the dose is 2.5 to 3.75 g daily.

◊ References.

1. Davidson MH, *et al.* Colesevelam hydrochloride (Cholestagel): a new, potent bile acid sequestrant associated with a low incidence of gastrointestinal side effects. *Arch Intern Med* 1999; **159:** 1893–1900.
2. Aldridge MA, Ito MK. Colesevelam hydrochloride: a novel bile acid-binding resin. *Ann Pharmacother* 2001; **35:** 898–907.
3. Steinmetz KL. Colesevelam hydrochloride. *Am J Health-Syst Pharm* 2002; **59:** 932–9.
4. Zieve FJ, *et al.* Results of the glucose-lowering effect of WelChol study (GLOWS): a randomized, double-blind, placebo-controlled pilot study evaluating the effect of colesevelam hydrochloride on glycemic control in subjects with type 2 diabetes. *Clin Ther* 2007; **29:** 74–83.
5. Bays H, Jones PH. Colesevelam hydrochloride: reducing atherosclerotic coronary heart disease risk factors. *Vasc Health Risk Manag* 2007; **3:** 733–42.
6. Florentin M, *et al.* Colesevelam hydrochloride in clinical practice: a new approach in the treatment of hypercholesterolaemia. *Curr Med Res Opin* 2008; **24:** 995–1009.
7. Goldberg RB, *et al.* Efficacy and safety of colesevelam in patients with type 2 diabetes mellitus and inadequate glycemic control receiving insulin-based therapy. *Arch Intern Med* 2008; **168:** 1531–40.
8. Fonseca VA, *et al.* Colesevelam HCl improves glycemic control and reduces LDL cholesterol in patients with inadequately controlled type 2 diabetes on sulfonylurea-based therapy. *Diabetes Care* 2008; **31:** 1479–84.

Preparations
Proprietary Preparations (details are given in Part 3)
Cz.: Cholestagel; ***Neth.:*** Cholestagel; ***Port.:*** Cholestagel; ***UK:*** Cholestagel; ***USA:*** Welchol.

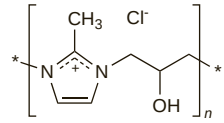
Colestilan *(rINN)*

Colestilan Chloride *(USAN)*; Colestilanum; Colestimide; MCI-196. 2-Methylimidazole polymer with 1-chloro-2,3-epoxypropane.

Колестилан

$(C_4H_6N_2.C_3H_5ClO)_n$.

CAS — 95522-45-5.



Profile
Colestilan, a bile-acid binding resin, is a lipid regulating drug with similar properties to colestyramine (p.1252). It is used to reduce cholesterol in the management of hyperlipidaemias (p.1169) and is given orally in a usual dose of 1.5 g twice daily. It is also under investigation in diabetes mellitus and as a phosphate binder in haemodialysis patients.

◊ References.

1. Kurihara S, *et al.* Effect of MCI-196 (colestilan) as a phosphate binder on hyperphosphataemia in haemodialysis patients: a double-blind, placebo-controlled, short-term trial. *Nephrol Dial Transplant* 2005; **20:** 424–30.
2. Yamakawa T, *et al.* Effect of colestimide therapy for glycemic control in type 2 diabetes mellitus with hypercholesterolemia. *Endocr J* 2007; **54:** 53–8.

Preparations
Proprietary Preparations (details are given in Part 3)
Jpn: Cholebine.

Colestipol Hydrochloride

(BANM, USAN, rINNM)

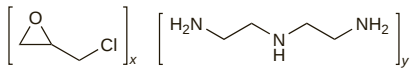
Colestipol, chlorhydrate de; Colestipoli hydrochloridum; Hidrocloruro de colestipol; Kolestipol Hidroklorür; U-26597A.

Колестипола Гидрохлорид

CAS — 26658-42-4 (colestipol); 50925-79-6 (colestipol); 37296-80-3 (colestipol hydrochloride).

ATC — C10AC02.

ATC Vet — QC10AC02.



(colestipol)

Pharmacopoeias. In *Br.* and *US.*

BP 2008 (Colestipol Hydrochloride). A copolymer of diethylenetriamine and epichlorohydrin (1-chloro-2,3-epoxypropane). Each g binds not less than 1.1 mEq and not more than 1.7 mEq of sodium cholate, calculated as the cholate binding capacity and with reference to the dried substance. Yellow to orange hygroscopic beads. Swells but does not dissolve in water and in dilute solutions of acids or alkalis. Practically insoluble in alcohol and in dichloromethane. The supernatant of a 10% w/w suspension in water has a pH of 6.0 to 7.5. Store in airtight containers.

USP 31 (Colestipol Hydrochloride). A basic anion-exchange resin. It is the hydrochloride of a copolymer of diethylenetriamine and epichlorohydrin (1-chloro-2,3-epoxypropane). Each g binds not less than 1.1 mEq and not more than 1.6 mEq of sodium cholate, calculated as cholate binding capacity. Yellow to orange beads. Swells but does not dissolve in water or dilute aqueous solutions of acids or alkalis. Insoluble in common organic solvents. The supernatant of a 10% w/w suspension in water has a pH of 6.0 to 7.5. Store in airtight containers.

Adverse Effects and Precautions
As for Colestyramine, p.1252.

Effects on thyroid function. Reductions in total serum-thyroxine and thyroxine-binding globulin concentrations were found during routine monitoring of thyroid function in patients receiving colestipol and nicotinic acid, but were considered to be benign.[1] This effect has been used therapeutically in patients with hyperthyroidism (see under Uses of Colestyramine, p.1253).

1. Cashin-Hemphill L, *et al.* Alterations in serum thyroid hormonal indices with colestipol-niacin therapy. *Ann Intern Med* 1987; **107:** 324–9.

Interactions
As for Colestyramine, p.1253.

Uses and Administration
Colestipol hydrochloride is a bile-acid binding resin and lipid regulating drug with actions similar to those of colestyramine (p.1253). It is used to reduce cholesterol in the treatment of hyperlipidaemias (p.1169), particularly type IIa hyperlipoproteinaemia.

Colestipol hydrochloride is available as granules and is given orally as a suspension in water or a flavoured vehicle. The initial dose is 5 g daily or twice daily, increasing gradually at intervals of 1 to 2 months to up to 30 g daily in a single dose or two divided doses as necessary.

Colestipol hydrochloride is also available as tablets; doses range from 2 to 16 g daily.

Preparations
BP 2008: Colestipol Granules;
USP 31: Colestipol Hydrochloride for Oral Suspension; Colestipol Hydrochloride Tablets.

Proprietary Preparations (details are given in Part 3)
Austral.: Colestid; ***Belg.:*** Colestid; ***Canad.:*** Colestid; ***Cz.:*** Colestid†; ***Denm.:*** Lestid; ***Fin.:*** Lestid; ***Ger.:*** Cholestabyl; Colestid; ***Gr.:*** Lestid†; ***Irl.:*** Colestid†; ***Israel:*** Colestid; ***Mex.:*** Colestid†; ***Neth.:*** Colestid†; ***Norw.:*** Lestid; ***NZ:*** Colestid; ***Port.:*** Colestid; ***Spain:*** Colestid; ***Swed.:*** Lestid; ***Switz.:*** Colestid; ***UK:*** Colestid; ***USA:*** Colestid.

Colestyramine *(BAN, rINN)*

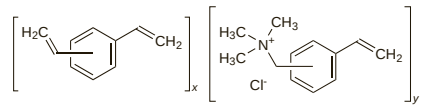
Cholestyramine; Cholestyramine Resin; Colestiramina; Colestyraminum; Divistyramine; Kolestiramin; Kolestiraminas; Kolestyramiini; Kolestyramin; Kolestyramina; MK-135.

Колестирамин

CAS — 11041-12-6.

ATC — C10AC01.

ATC Vet — QC10AC01.



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

Ph. Eur. 6.2 (Colestyramine). A strongly basic anion-exchange resin in the chloride form, consisting of styrene-divinylbenzene copolymer with quaternary ammonium groups. Each g exchanges not less than 1.8 g and not more than 2.2 g of sodium glycocholate, calculated with reference to the dried material. A white or almost white, fine, hygroscopic powder. Insoluble in water, in alcohol, and in dichloromethane. A 1% suspension in water has a pH of 4.0 to 6.0 after standing for 10 minutes. Store in airtight containers.

USP 31 (Cholestyramine Resin). A strongly basic anion-exchange resin containing quaternary ammonium functional groups which are attached to a styrene-divinylbenzene copolymer. Each g exchanges not less than 1.8 g and not more than 2.2 g of sodium glycocholate, calculated on the dried basis. It is used in the chloride form. A white to buff-coloured, hygroscopic, fine powder, odourless or has not more than a slight amine-like odour. It loses not more than 12% of its weight on drying. Insoluble in water, in alcohol, in chloroform, and in ether. A 1% slurry in water has a pH of 4.0 to 6.0. Store in airtight containers.

Adverse Effects
The most common adverse effect of colestyramine is constipation; faecal impaction may develop and haemorrhoids may be aggravated. Other gastrointestinal adverse effects include abdominal discomfort or pain, heartburn, flatulence, nausea, vomiting, and diarrhoea.