

Pharmacopoeias. In *Chin.* and *Eur.* (see p.vii). *US* specifies the monohydrate.

Ph. Eur. 6.2 (Meclozine Hydrochloride). A yellow or yellowish-white, crystalline powder. Slightly soluble in water; soluble in alcohol and in dichloromethane. Store in airtight containers.

USP 31 (Meclozine Hydrochloride). The monohydrate is white or slightly yellowish crystalline powder that has a slight odour. Practically insoluble in water and in ether; freely soluble in chloroform, in pyridine, and in acid-alcohol-water mixtures; slightly soluble in dilute acids and in alcohol. Store in airtight containers.

Adverse Effects and Precautions

As for the sedating antihistamines in general, p.561. For reports of the use of antihistamines, including meclizine, in pregnancy, see p.563.

Interactions

As for the sedating antihistamines in general, p.563.

Uses and Administration

Meclozine hydrochloride, a piperazine derivative, is a sedating antihistamine with antimuscarinic and moderate sedative properties. It is mainly used for its antiemetic action, which may last for up to 24 hours. Meclozine hydrochloride is used in the prevention and treatment of nausea and vomiting associated with a variety of conditions including motion sickness (p.564) and for the symptomatic treatment of vertigo (p.565) caused by Ménière's disease and other vestibular disorders. Meclozine hydrochloride has also been used for the symptomatic relief of hypersensitivity reactions and pruritic skin disorders (p.565).

The usual oral dose of meclizine hydrochloride for motion sickness is 25 to 50 mg taken about one hour before travelling and repeated every 24 hours if necessary; up to 100 mg daily in divided doses has been given for the treatment of vertigo and vestibular disorders. In the prevention and treatment of motion sickness in children aged 6 to 12 years, 12.5 mg is given once daily; for children aged 2 to 6 years the dose is 6.25 mg once daily.

Both meclizine hydrochloride and meclizine base have been given by the rectal route; doses are similar to those given orally.

Preparations

USP 31: Meclozine Hydrochloride Tablets.

Proprietary Preparations (details are given in Part 3)

Belg.: Agyrax; Postafene; **Braz.:** Medlin; **Canad.:** Bonamine; **Chile:** Bonamina; **Cz.:** Postafen; **Denm.:** Postafen; **Fin.:** Postafen; **Fr.:** Agyrax; **Ger.:** Peremesin N; Peremesin; Postadoxin N; Postafen; **Gr.:** Emetostop; Postafene; **Hong Kong:** Postafene; **Mex.:** Chichida; Marenin; **Neth.:** Suprimal; **Norw.:** Peremesin; Postafen; **NZ:** Sea-Legs; **Philipp.:** Bonamine; Postadoxine; **Port.:** Navicalm; **Rus.:** Bonine (Бонин); **Spain:** Chichida; Dramine; Navicalm; **Swed.:** Postafen; **Switz.:** Duremesan; **Turk.:** Postadoxine; **UK:** Sea-Legs; **USA:** Antivert; Antrizine; Bonine; Dizmiss; Dramamine II; Meni-D; Vergon; **Yug.:** Vergon.

Multi-ingredient: **Austria:** Contravent B; **Diligan:** Ger. Diligan; **Hong Kong:** Navidoxine; **India:** Diligan; Pregidoxin; **Malaysia:** Becoloxin; Navidoxine; **Mex.:** Bonadroxina; Bonalen; Bonazin; Emediba; Liatrix; Medifar; Medislon; Pldoxina; Vo-Renni; **Neth.:** Emesefan; **Port.:** Diligan; **S.Afr.:** Geratan; **Singapore:** Navidoxine; **Switz.:** Duremesan; Itinerol B; **UK:** Travelzee; **Venez.:** Bonadroxina; Etizil; Mebabx.

Mepyramine (BAN, rINN)

Mepiramina; Mepyramini; Mepyramin; Mépyramine; Mepyraminum; Pyranisamine; Pylamine. 2-(N-p-Anisyl-N-2-pyridylamino)ethyldimethylamine.

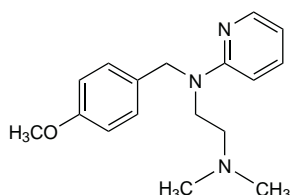
Мепирамин

$C_{17}H_{23}N_3O = 285.4$.

CAS — 91-84-9.

ATC — D04AA02; R06AC01.

ATC Vet — QD04AA02; QR06AC01.



Mepyramine Hydrochloride (BANM, rINNM)

Hidrocloruro de mepiramina; Mépyramine, Chlorhydrate de; Mepyramini Hydrochloridum; Pyranisamine Hydrochloride; Pylamine Hydrochloride.

Мепирамина Гидрохлорид

$C_{17}H_{23}N_3O \cdot HCl = 321.8$.

CAS — 6036-95-9.

ATC — D04AA02; R06AC01.

ATC Vet — QD04AA02; QR06AC01.

Mepyramine Maleate (BANM, rINNM)

Maleato de mepiramina; Mepiramin Maleat; Mepiramin-maleát; Mepiramino maleatas; Mepyraminimaleaatti; Mepyramin maleinát; Mépyramine, maléate de; Mepyramini maleas; Mepyraminmaleat; Pyranisamine Maleate; Pylamine Maleate. Mepyramine hydrogen maleate.

Мепирамина Малат

$C_{17}H_{23}N_3O \cdot C_4H_4O_4 = 401.5$.

CAS — 59-33-6.

ATC — D04AA02; R06AC01.

ATC Vet — QD04AA02; QR06AC01.

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

Ph. Eur. 6.2 (Mepyramine Maleate). A white or slightly yellowish, crystalline powder. Very soluble in water; freely soluble in alcohol. M.p. 99° to 103°. A 2% solution in water has a pH of 4.9 to 5.2. Protect from light.

USP 31 (Pylamine Maleate). A white crystalline powder usually having a faint odour. Soluble 1 in 0.5 of water, 1 in 3 of alcohol, 1 in 15 of dehydrated alcohol, and 1 in 2 of chloroform; slightly soluble in ether and in benzene. Its solutions are acid to litmus. Store in airtight containers. Protect from light.

Adverse Effects and Precautions

As for the sedating antihistamines in general, p.561.

Interactions

As for the sedating antihistamines in general, p.563.

Uses and Administration

Mepyramine, an ethylenediamine derivative, is a sedating antihistamine with antimuscarinic and sedative properties. Mepyramine maleate is used for the symptomatic relief of hypersensitivity reactions and in pruritic skin disorders (p.565). Mepyramine maleate is also a common ingredient of compound preparations for the symptomatic treatment of coughs and the common cold (p.564).

Mepyramine maleate has been given in an oral dose of 50 mg at night as a hypnotic in the short-term management of insomnia (p.564).

A cream containing 2% mepyramine maleate is used locally for insect bites or stings, and for hypersensitivity and pruritic skin conditions but, as with any antihistamine, there is a risk of sensitisation. It has also been used in eye drops.

In some countries mepyramine maleate is available for parenteral use. Mepyramine hydrochloride has also been given parenterally or by the rectal route. Mepyramine tannate and mepyramine acefyllinate have been used orally.

Preparations

BP 2008: Mepyramine Tablets.

USP 31: Pylamine Maleate Tablets.

Proprietary Preparations (details are given in Part 3)

Austral.: Relaxa-Tabs; **Braz.:** Alergitan; **Hong Kong:** Anthisan; **Irl.:** Anthisan; **NZ:** Anthisan; **S.Afr.:** Anthisan; Anthist; Mepyraderm; Mepyramil; **Spain:** Fluidasa; **UK:** Anthisan; **USA:** Pyrex.

Multi-ingredient: **Arg.:** Bajumol; **Drynisan:** Everfer; Fadanasa; Piracalmina; Polipetol; Rynatanic; **Austral.:** Neo-Diophen; **Belg.:** Nortussine; **Braz.:** Alergitrat; Alergo Glucalbet; Beclase; Benistina; Benzomel; Codinrin; Expectussin; Ginometrin Oral; Gripanil; Gripsay; Killgrip; Naridrin; Naniflux; Nasogrip; Posdrink; **Canad.:** Extra Strength Multi-Symptom PMS Relief; Hycomine; Jack and Jill; Midol Extra Strength; Midol PMS Extra Strength; Pamprin; Prefrin A; ratio-Theo-Bronc; Relievul PMS; Trendar PMS; Tylenol Menstrual; **Chile:** Alerzona; Kitadol Periodo Menstrual; Minfaden; Predual; Rinolergan; Tapsin Periodo Menstrual; **Fr.:** Nortussine; **Hong Kong:** Easiko; **Israel:** Aforinol; Alnase; Phenylphrine-Azol; **Ital.:** Balsamina Kroner; Triaminic; Vasofen; **Malaysia:** Prefrin A; **Mex.:** Femsedin Kutz; Lentostamin; **Pol.:** Kato-Nasal; Pro-Miss; **Port.:** Antigrippine; Naso-Prieulina; Profrin-A; Solpici; **S.Afr.:** Antiflut; Bronchiflut; Codef; Codomil; Colcaps; Coughcod; Docsed; Expectotussin C; Flucol; Histodor; Medituss; Metaxol; Sinu-Flu; **Singapore:** Prefrin A; **Spain:** Amplidermis; Pectabol Dextro; **Switz.:** Calpred; Demostan N; Escognip sans codeine; Euceta Pic; Histacyl Compositum; Histacylletest; Stilex; **Thai.:** Antergan; **Turk.:** Peditus; Stilex; **UAE:** Profinal FM; **UK:** Anthisan Plus; Wasp-Eze; **USA:** 4-Way Fast Acting; AlleRx; C-Tanna 12D; Calamycin; Codal-DH; Codal-DM; Codimal DM; Codimal PH; Conal; De-Chlor MR; Derma-Pax; Duonate; Gelhist; HC Derma-Pax; Midol Maximum Strength Multi-

Symptom Menstrual; Midol Pre-Menstrual Syndrome; Myci-Spray; MyHist-DM; MyHist-PD; Nalex-A 12; ND-Gesic; P-Hist; P-Tanna; Pamprin; Poly-Histene; Premysn PMS; Pro-Red; Pyrex CB; R-Tanna; R-Tannamine; R-Tannate; R-Tannic-S; Rectagene Medicated Rectal Balm; Resperal; Rhinater; Robitussin Night Relief; Ryna-12; Soothadern; Tanoral; Tri-Tannate; Tri-codene Cough & Cold; Triotann; Triplex AD; Tritan; Tussi-12 D; Tussi-12D S; Tussplex; Viravan; Viravan-DM; Z-Xtra; **Venez.:** Fesanol; Metilcodin; Metilfedrin; Pi-Fedrin; Pinazo.

Mequitazine (BAN, rINN)

LM-209; Mekitatsini; Mekitazin; Mequitazina; Méquitazine; Mequitazinum. 10-(Quinuclidin-3-ylmethyl)phenothiazine.

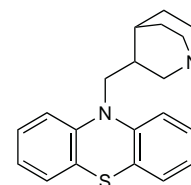
Мехитазин

$C_{20}H_{22}N_2S = 322.5$.

CAS — 29216-28-2.

ATC — R06AD07.

ATC Vet — QR06AD07.



Pharmacopoeias. In *Jpn.*

Adverse Effects and Precautions

As for the sedating antihistamines in general, p.561.

Sedation. For discussion of the sedative effects of antihistamines, see p.562. When mequitazine is given in the recommended dosage of 5 mg twice daily the incidence of sedation appears comparable with that of terfenadine. Sedation has, however, occurred after doses of 10 mg twice daily.

Interactions

As for the sedating antihistamines in general, p.563.

Antibacterials. For a report of torsade de pointes in a patient taking spiramycin and mequitazine, see Cytochrome P450 Isoenzymes under Interactions of Spiramycin, p.333.

Pharmacokinetics

After absorption from the gastrointestinal tract, mequitazine is metabolised. Unchanged drug and metabolites are excreted principally in the bile.

Uses and Administration

Mequitazine, a phenothiazine derivative, is a sedating antihistamine with antimuscarinic and mild sedative properties.

Mequitazine is used for the symptomatic relief of allergic conditions including urticaria (p.565), rhinitis (p.565) and conjunctivitis (p.564), and in pruritic skin disorders (p.565). It has been given in usual oral doses of 5 mg twice daily.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: Primalan; **Chile:** Mircol; **Fr.:** Primalan; Quitadril; **Ger.:** Metaplexan; **Ital.:** Primalan; **Mex.:** Primalan; **Philipp.:** Primalan; **Port.:** Primalan; **Rus.:** Primalan (Трималан); **Spain:** Mircol.

Methdilazine (BAN, rINN)

Metdilatsini; Metdilazin; Metdilazina; Methdilazinum; Metodilazina. 10-(1-Methylpyrrolidin-3-ylmethyl)phenothiazine.

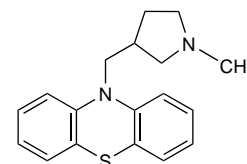
Метдилазин

$C_{18}H_{20}N_2S = 296.4$.

CAS — 1982-37-2.

ATC — R06AD04.

ATC Vet — QR06AD04.



Methdilazine Hydrochloride (BANM, rINNM)

Hidrocloruro de metodilazina; Methdilazine, Chlorhydrate de; Methdilazini Hydrochloridum.

Метдилазина Гидрохлорид

$C_{18}H_{20}N_2S \cdot HCl = 332.9$.

CAS — 1229-35-2.

ATC — R06AD04.

ATC Vet — QR06AD04.

The symbol † denotes a preparation no longer actively marketed

Pharmacopoeias. In *US*.

USP 31 (Methdilazine Hydrochloride). A light tan crystalline powder having a slight characteristic odour. Soluble 1 in 2 of water and of alcohol, 1 in 6 of chloroform, and 1 in 1 of 0.1N hydrochloric acid and of 0.1N sodium hydroxide solution; practically insoluble in ether. pH of a 1% solution in water is between 4.8 and 6.0. Store in airtight containers. Protect from light.

Adverse Effects and Precautions

As for the sedating antihistamines in general, p.561.

Interactions

As for the sedating antihistamines in general, p.563.

Uses and Administration

Methdilazine, a phenothiazine derivative, is a sedating antihistamine with antimuscarinic and sedative activity. Methdilazine is also reported to have serotonin-antagonist properties.

Methdilazine hydrochloride is used for the symptomatic relief of hypersensitivity reactions and particularly for the control of pruritic skin disorders (p.565). An oral dose of 8 mg has been given 2 to 4 times daily. Methdilazine base has been used in similar doses. For children's doses, see below.

Administration in children. Methdilazine hydrochloride has been used in children for symptomatic relief of hypersensitivity reactions and particularly for the control of pruritic skin disorders. Oral doses of 4 mg given 2 to 4 times daily have been used in children aged 3 to 12 years. However, lower daily doses have also been used: children aged 3 to 6 years may be given 300 micrograms/kg daily (maximum 8 mg daily) and those aged 6 to 12 years, 4 mg twice daily.

Preparations

USP 31: Methdilazine Hydrochloride Syrup; Methdilazine Hydrochloride Tablets.

Proprietary Preparations (details are given in Part 3)

Austral.: Dilosyn†; **Denm.:** Tacryl†; **India:** Dilosyn.

Multi-ingredient: **India:** Dilosyn Expectorant.

Mizolastine (BAN, rINN)

Mitsolastini; Mizolastin; Mizolastina; Mizolastinum; SL-85.0324-00. 2-{[1-(4-Fluorobenzyl)-1H-benzimidazol-2-yl]-4-piperidyl(methyl)amino}pyrimidin-4(1H)-one.

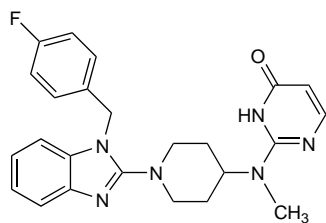
МИЗОЛАСТИН

$C_{24}H_{25}FN_6O = 432.5$.

CAS — 108612-45-9.

ATC — R06AX25.

ATC Vet — QR06AX25.

**Adverse Effects and Precautions**

As for the non-sedating antihistamines in general, p.561. Mizolastine has only a weak potential to prolong the QT interval (see also Arrhythmias, p.562) and has not been associated with arrhythmias. However, the manufacturers have warned against the use of mizolastine in patients with significant cardiac or hepatic disease, with hypokalaemia or other electrolyte imbalance, or with known or suspected QT prolongation. Use with drugs liable to interfere with the hepatic metabolism of mizolastine or with other potentially arrhythmogenic drugs should also be avoided (see under Interactions, below).

Interactions

As for the non-sedating antihistamines in general, p.563. Moderate increases in plasma concentrations of mizolastine have been reported with erythromycin and ketoconazole; use with macrolide antibacterials or sys-

temic imidazole antifungals is contra-indicated by the manufacturer. They also advise against use of mizolastine with drugs known to prolong the QT interval, such as class I and III antiarrhythmics.

Other potent inhibitors of or substrates for the hepatic metabolism of mizolastine include cimetidine, ciclosporin, and nifedipine; caution is advised if given together.

Pharmacokinetics

Mizolastine is rapidly absorbed from the gastrointestinal tract with peak plasma concentrations being reached after about 1.5 hours. Plasma protein binding is about 98%. The mean elimination half-life is about 13 hours. Mizolastine is mainly metabolised by glucuronidation although other metabolic pathways are involved, including metabolism by the cytochrome P450 isoenzyme CYP3A4, with the formation of inactive hydroxylated metabolites.

References.

- Rosenzweig P, *et al.* Pharmacodynamics and pharmacokinetics of mizolastine (SL 85.0324), a new non-sedative H₁ antihistamine. *Ann Allergy* 1992; **69**: 135–9.
- Lebrun-Vignes B, *et al.* Clinical pharmacokinetics of mizolastine. *Clin Pharmacokinet* 2001; **40**: 501–7.

Uses and Administration

Mizolastine is a non-sedating antihistamine with a long duration of action. It does not have significant antimuscarinic actions; it is reported to have mast-cell stabilising properties. Mizolastine is used for the symptomatic relief of allergic conditions including rhinitis (p.565), conjunctivitis (p.564), and skin disorders such as urticaria (p.565). The oral dose is 10 mg daily.

References.

- Leynadier F, *et al.* Efficacy and safety of mizolastine in seasonal allergic rhinitis. *Ann Allergy Asthma Immunol* 1996; **76**: 163–8.
- Brostoff J, *et al.* Efficacy of mizolastine, a new antihistamine, compared with placebo in the treatment of chronic idiopathic urticaria. *Allergy* 1996; **51**: 320–5.
- Stern MA, *et al.* Can an antihistamine delay appearance of hay-fever symptoms when given prior to pollen season? *Allergy* 1997; **52**: 440–4.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: Mistamine†; **Austria:** Mizollen; **Belg.:** Mistamine†; Mizollen; **Chile:** Mistamine†; **Cz.:** Mizollen; **Denm.:** Mizollen; **Fin.:** Mizollen; **Fr.:** Mizollen; **Ger.:** Mizollen; Zolim; **Gr.:** Mizollen; Oriens; **Hung.:** Mizollen; **India:** Elina; **Irl.:** Mistamine†; **Israel:** Mizollen; **Ital.:** Mizollen; Zolistan; **Mex.:** Mistamine; **Neth.:** Mizollen; **Pol.:** Mizollen; **Port.:** Mistamine†; Mizollen; Zolistan; **S.Afr.:** Mizollen; **Spain:** Mistamine†; Mizollen; Zolistan; **Swed.:** Mizollen; **Switz.:** Mistamine†; Mizollen; **UK:** Mizollen.

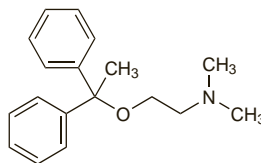
Moxastine Teoclate (rINN)

Mephenhydramine Theoclate; Mephenhydrinate; Moxastine, Téoclate de; Moxastine Theoclate; Moxastini Teodas; Teoclato de moxastina. 2-[(1,1-Diphenylethoxy)-N,N-dimethylethylamine 8-chlorotheophyllinate.

МОКАСТИНА ТЕОКЛАТ

$C_{18}H_{23}NO_6Cl_4 = 472.0$.

CAS — 3572-74-5 (moxastine); 21661-62-1 (moxastine teoclate).



(moxastine)

Profile

Moxastine teoclate is an antihistamine with antiemetic properties. It is used to treat nausea and vertigo associated with Ménière's disease and other vestibular disorders, and for the prevention and treatment of motion sickness.

Preparations

Proprietary Preparations (details are given in Part 3)

Cz.: Kinedryl.

Multi-ingredient: **Cz.:** Nokinal†.

Niaprazine (rINN)

1709-CERM; Niaprazina; Niaprazinum. N-[3-(4-p-Fluorophenyl)-piperazin-1-yl]-1-methylpropyl]nicotinamide.

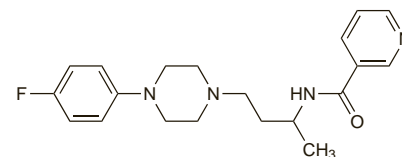
НИАПРАЗИН

$C_{20}H_{25}FN_4O = 356.4$.

CAS — 27367-90-4.

ATC — N05CM16.

ATC Vet — QN05CM16.

**Profile**

Niaprazine, a piperazine derivative, is an antihistamine (p.561) used in children for its sedative and hypnotic properties. The usual oral dose is 1 mg/kg at night.

Preparations

Proprietary Preparations (details are given in Part 3)

Fr.: Nopron; **Ital.:** Nopron.

Olopatadine Hydrochloride (BANM, USAN, pINN)

ALO-4943A; Hidrocloruro de olopatadina; KW-4679; Olopatadin Hidroklorür; Olopatadine, Chlorhydrate d'; Olopatadini Hydrochloridum. 11-[(Z)-3-(Dimethylamino)propylidene]-6,11-dihydrodibenz[b,e]oxepin-2-acetic acid hydrochloride.

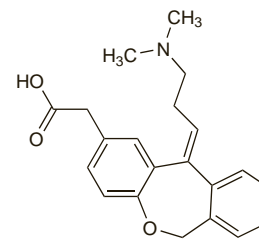
ОЛОПАТАДИНА ГИДРОХЛОРИД

$C_{21}H_{23}NO_3 \cdot HCl = 373.9$.

CAS — 113806-05-6 (olopatadine); 140462-76-6 (olopatadine hydrochloride).

ATC — R01AC08; S01GX09.

ATC Vet — QS01GX09.



(olopatadine)

Adverse Effects and Precautions

As for the antihistamines in general, p.561. Headache and stinging or burning of the eye have occurred after ocular use.

Uses and Administration

Olopatadine hydrochloride is an antihistamine with mast-cell stabilising properties. It is used twice daily as eye drops containing the equivalent of 0.1% of olopatadine base in the treatment of allergic conjunctivitis (p.564) in adults and children aged three years and over.

References.

- Anonymous. Olopatadine for allergic conjunctivitis. *Med Lett Drugs Ther* 1997; **39**: 108–9.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: Patanol; **Austral.:** Patanol; **Belg.:** Opatanol; **Braz.:** Patanol; **Canad.:** Patanol; **Chile:** Patanol; **Cz.:** Opatanol; **Denm.:** Opatanol; **Fin.:** Opatanol; **Fr.:** Opatanol; **Ger.:** Opatanol; **Gr.:** Opatanol; **Hong Kong:** Patanol; **Hung.:** Opatanol; **Indon.:** Patanol; **Irl.:** Opatanol; **Israel:** Patanol; **Ital.:** Opatanol; **Jpn.:** Allelock; **Malaysia:** Patanol; **Mex.:** Patanol; **Neth.:** Opatanol; **Norw.:** Opatanol; **NZ:** Patanol; **Philipp.:** Patanol; **Port.:** Opatanol; **Rus.:** Opatanol (Опатанол); **S.Afr.:** Patanol; **Singapore:** Patanol; **Spain:** Opatanol; **Swed.:** Opatanol; **Switz.:** Opatanol; **Thai.:** Patanol; **Turk.:** Patanol; **UK:** Opatanol; **USA:** Pataday; Patanol; **Venez.:** Patanol.