### Preparations

**Proprietary Preparations** (details are given in Part 3)
***Austria:*** Colme; ***Rus.:*** Colme (Колме); ***Spain:*** Colme.

## Calcium Dihydrogen Phosphate

Acid Calcium Phosphate; Calcium Dihydrogenphosphoricum; E341; Fosfato monocálcico; Monobasic Calcium Phosphate; Monocalcium Phosphate. Calcium tetrahydrogen diorthophosphate monohydrate.

$Ca(H_2PO_4)_2,H_2O$ = 252.1.
*CAS — 7758-23-8 (anhydrous calcium dihydrogen phosphate).*

**Pharmacopoeias.** In *Jpn* and *Swiss*.

### Profile

Calcium dihydrogen phosphate is used in fertilisers. It is also used as an antoxidant in baking powders and flours and as a source of calcium in some mineral supplement preparations.

### Preparations

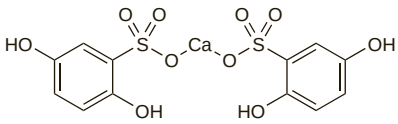
**Proprietary Preparations** (details are given in Part 3)
**Multi-ingredient:** ***Fr.:*** Phosphoneuros.

## Calcium Dobesilate *(rINN)*

Calcii dobesilas; Calcium, dobésilate de; Calcium Doxybenzylate; CLS-2210; Dobesilan vápenatý; Dobésilate de Calcium; Dobesilato de calcio; 205E; Kalcio dobesilatas; Kalciumdobesilat; Kalcium-dobezilát; Kalsiumdobesilaatti; Kalsiyum Dobesilat. Calcium 2,5-dihydroxybenzenesulphonate.

Кальция Добезилат

$C_{12}H_{10}CaO_{10}S_2$ = 418.4.
*CAS — 88-46-0 (dobesilic acid); 20123-80-2 (calcium dobesilate).*
*ATC — C05BX01.*
*ATC Vet — QC05BX01.*



**Pharmacopoeias.** In *Eur.* (see p.vii) which specifies the monohydrate.
**Ph. Eur. 6.2** (Calcium Dobesilate Monohydrate). A white or almost white hygroscopic powder. Very soluble in water; freely soluble in dehydrated alcohol; practically insoluble in dichloromethane; very slightly soluble in isopropyl alcohol. A 10% solution in water has a pH of 4.5 to 6.0. Store in airtight containers. Protect from light.

### Profile

Calcium dobesilate is claimed to reduce capillary permeability and has been used in various peripheral circulatory disorders including diabetic retinopathy and haemorrhoids (p.1697). Gastrointestinal disturbances have occurred with its use, and there are also reports of hypersensitivity reactions.

Calcium dobesilate is given orally in usual doses of 0.5 to 1.5 g daily in divided doses. It is also given rectally for haemorrhoids and is an ingredient of some preparations given for various skin disorders.

◊ Reviews.


1. Tejerina T, Ruiz E. Calcium dobesilate: pharmacology and future approaches. *Gen Pharmacol* 1998; **31:** 357–60.
2. Berthet P, *et al*. Calcium dobesilate: pharmacological profile related to its use in diabetic retinopathy. *Int J Clin Pract* 1999; **53:** 631–6.


**Adverse effects.** Agranulocytosis has been reported[1-3] in a few patients after treatment with calcium dobesilate, and in 2 cases recurred on rechallenge.[1,2] However, a later review[4] of the safety profile of calcium dobesilate concluded that the overall risk of adverse effects was low with the most prominent symptoms being fever, arthralgias, and gastrointestinal disturbances. Reports of agranulocytosis were rare and the authors concluded that there may have been methodological bias in previous assessments of risk.


1. Kulessa W, *et al*. Wiederholte Agranulozytose nach Einnahme von Calciumdobesilat. *Dtsch Med Wochenschr* 1992; **117:** 372–4.
2. Cladera Serra A, *et al*. Agranulocitosis inducida por dobesilato calcico. *Med Clin (Barc)* 1995; **105:** 558–9.
3. García Benayas E, *et al*. Calcium dobesilate-induced agranulocytosis. *Pharm World Sci* 1997; **19:** 251–2.
4. Allain H, *et al*. Safety of calcium dobesilate in chronic venous disease, diabetic retinopathy and haemorrhoids. *Drug Safety* 2004; **27:** 649–60.


### Preparations

**Proprietary Preparations** (details are given in Part 3)
***Arg.:*** Doxium; Duflemina†; Eflevar; ***Austria:*** Doxium; Vasactin; ***Chile:*** Doxium; ***Cz.:*** Danium; Dobica; Doxium; ***Ger.:*** Dexium; Dobica; ***Gr.:*** Doxytrex; Nugatex; ***Hong Kong:*** Dobesifar†; Doxium; ***Hung.:*** Doxilek; Doxium; ***India:*** Dobilet; ***Ital.:*** Doxium; ***Malaysia:*** Doxium; ***Mex.:*** Doxium; ***Philipp.:*** Doxium; ***Pol.:*** Doxium; ***Port.:*** Doxi-Om; ***Rus.:*** Doxi-Hem (Докси-хем); ***S.Afr.:*** Doxium; ***Spain:*** Doxium; ***Switz.:*** Doxium; ***Turk.:*** Doxium; ***Venez.:*** Deoxical; Doxium.

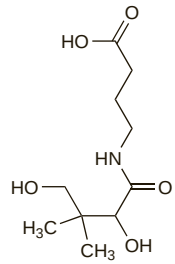
**Multi-ingredient:** ***Arg.:*** Vasodual†; ***Cz.:*** Danium Compositum†; Dobexil; Dobexil Plus†; Doxiproct; Doxiproct Plus; Doxivenil†; ***Hung.:*** Doxiproct; Doxiproct Plus; Doxivenil; ***Ital.:*** Doxiproct; ***Mex.:*** Doxiproct Plus; Doxiproct†; ***Port.:*** Doxiproct; Doxiproct Plus; Doxivenil; ***Spain:*** Acnisdin; Acnisdin Retinoico; Proctium; ***Switz.:*** Doxiproct; Doxiproct Plus; Doxivenil; ***Venez.:*** Doxivenil.

## Calcium Hopantenate *(rINNM)*

Calcii Hopantenas; Calcium Homopantothenate; Hopanténate de Calcium; Hopantenato cálcico. Calcium D-(+)-4-(2,4-dihydroxy-3,3-dimethylbutyramido)butyrate hemihydrate.

Кальций Гопантенат

$Ca(C_{10}H_{18}NO_5)_2,H_2O$ = 513.6.
*CAS — 18679-90-8 (hopantenic acid); 17097-76-6 (anhydrous calcium hopantenate); 1990-07-4 (calcium hopantenate hemihydrate).*



*(hopantenic acid)*

### Profile

Calcium hopantenate is a homologue of pantothenic acid (p.1959) and has been tried in the treatment of various behavioural and extrapyramidal disorders. Its use is limited by severe metabolic adverse effects and fatalities have been reported.

### Preparations

**Proprietary Preparations** (details are given in Part 3)
***Rus.:*** Pantocalcin (Пантокальцин); Pantogam (Пантогам); Pantohamum (Пантогам)†.

## Calcium Hydroxide

Calcii hydroxidum; Calcium Hydrate; Calcium, hydroxyde de; E526; Hidróxido cálcico; Hydroxid vápenatý; Kalcio hidroksidas; Kalcium-hidroxid; Kalciumhydroxid; Kalsiumhydroksidi; Slaked Lime; Wapnia wodorotlenek.

$Ca(OH)_2$ = 74.09.
*CAS — 1305-62-0.*

**Pharmacopoeias.** In *Eur.* (see p.vii), *Jpn*, *US*, and *Viet.*
**Ph. Eur. 6.2** (Calcium Hydroxide). A fine white or almost white powder. Practically insoluble in water.
**USP 31** (Calcium Hydroxide). A white powder with a slightly bitter alkaline taste. Soluble 1 in 630 of water and 1 in 1300 of boiling water; insoluble in alcohol; soluble in glycerol and in syrup. Store in airtight containers.

### Profile

Calcium hydroxide is a weak alkali. It is used in the form of Calcium Hydroxide Solution (lime water) in some skin lotions and oily preparations to form calcium soaps of fatty acids which produce water-in-oil emulsions.

Calcium hydroxide pastes are used in dentistry. A paste made from a mixture of calcium hydroxide and potassium hydroxide and known as Vienna paste was used as an escharotic. Soda lime (p.2388) is a mixture of calcium hydroxide and potassium hydroxide and/or sodium hydroxide. With sulfur, calcium hydroxide forms sulfurated lime solution (p.1614).

**Homoeopathy.** Calcium hydroxide has been used in homoeopathic medicines under the following names: Calcarea caustica; Cal. caus.

**Adverse effects.** A report of ocular alkali burns in children, leading to severe visual loss, caused by packets of calcium hydroxide ('Chuna') popularly consumed in India as an additive to chewing tobacco.[1]

For the use of sodium edetate in the treatment of calcium hydroxide burns of the eye, see p.1464.


1. Agarwal T, Vajpayee RB. A warning about the dangers of chuna packets. *Lancet* 2003; **361:** 2247.


### Preparations

***BP 2008:*** Calcium Hydroxide Solution;
***USP 31:*** Calcium Hydroxide Topical Solution.

**Proprietary Preparations** (details are given in Part 3)
***Ger.:*** Dermi-cyl; ***Mex.:*** Oleoderm.

**Multi-ingredient:** ***Cz.:*** Aviril H†; ***Mex.:*** Caliderm; Liniderm; Oleoderm Plus; ***Pol.:*** Acne Sulf; ***Spain:*** Cremsol; ***Switz.:*** Sansilla.

## Calcium Oxide

Calcii Oxidum; Calcium Oxydatum; Calcium, oxyde de; Calx; Calx Usta; Chaux Vive; E529; Gebrannter Kalk; Lime; Oxid vápenatý; Óxido de calcio; Quicklime; Wapnia tlenek; Wapnia tlenek.

CaO = 56.08.
*CAS — 1305-78-8.*
*ATC Vet — QP53AX18.*

**Pharmacopoeias.** In *Jpn*, *Pol.*, and *US*.
**USP 31** (Lime). Hard, odourless, white or greyish-white masses, granules, or powder. When it is moistened with water a reaction occurs, heat being evolved and calcium hydroxide formed. Slightly soluble in water; very slightly soluble in boiling water. Store in airtight containers.

### Adverse Effects and Treatment

Calcium oxide may cause burns on contact with moist skin and mucous membranes; it is particularly irritant to the eyes. Washing or flooding of affected areas may need to be prolonged. Pneumonitis may follow inhalation.

◊ For the use of sodium edetate in the treatment of calcium oxide burns of the eye, see p.1464.

### Uses and Administration

Calcium oxide has been used in various dermatological preparations. A paste made from a mixture of calcium oxide and sodium hydroxide and known as London paste was used as an escharotic.

### Preparations

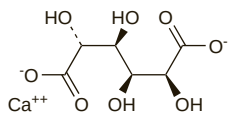
**Proprietary Preparations** (details are given in Part 3)
**Multi-ingredient:** ***Ital.:*** Oleo Calcarea†.

## Calcium Saccharate *(rINN)*

Calcii Saccharas; Calcium D-Saccharate; Sacarato cálcico; Sacarato de calcio; Saccharate de Calcium; Sucrate de Calcium. Calcium D-glucarate tetrahydrate.

Кальция Сахарат

$C_6H_8CaO_8,4H_2O$ = 320.3.
*CAS — 5793-88-4 (anhydrous calcium saccharate); 5793-89-5 (calcium saccharate tetrahydrate).*



NOTE. The names calcium saccharate and calcium sucrate have also been used to describe saccharated lime.

**Pharmacopoeias.** In *US*.
**USP 31** (Calcium Saccharate). A white, odourless, crystalline powder. Very slightly soluble in cold water and in alcohol; slightly soluble in boiling water; practically insoluble in chloroform and in ether; soluble in dilute mineral acids and in solutions of calcium gluconate.

### Profile

Calcium saccharate is used as a stabilising agent in solutions of calcium gluconate for injection. Each g of calcium saccharate contains about 3.1 mmol of calcium. Calcium saccharate 8 g is equivalent to about 1 g of calcium.

### Preparations

**Proprietary Preparations** (details are given in Part 3)
***Austria:*** Calcium Fresenius; ***Ger.:*** Calcium Fresenius†.

**Multi-ingredient:** ***Ger.:*** Calcium Braun; ***Switz.:*** C-Calcium; Glucocalcium.

## Calcium Sulfate

Calcii sulfas; Calcium, sulfate de; Calcium Sulphate; E516; Gypsum (calcium sulfate dihydrate); Kalcio sulfatas; Kalciumsulfat; Kalcium-szulfát; Kalsiumsulfaatti; Síran vápenatý; Sulfato cálcico; Wapnia siarczan.

$CaSO_4$ = 136.1.
*CAS — 7778-18-9 (anhydrous calcium sulfate); 10101-41-4 (calcium sulfate dihydrate).*

**Pharmacopoeias.** In *Chin.*, *Eur.* (see p.vii), *Int.*, and *Jpn* which specify the dihydrate. Also in *USNF* which specifies the dihydrate or the anhydrous material.
**Ph. Eur. 6.2** (Calcium Sulphate Dihydrate). A white or almost white fine powder. Very slightly soluble in water; practically

insoluble in alcohol.
**USNF 26** (Calcium Sulfate). It is anhydrous or contains two molecules of water of hydration. A white to slightly yellow-white odourless fine powder. Soluble 1 in 375 of water and 1 in 485 of boiling water; soluble in 3N hydrochloric acid.

### Profile
Calcium sulfate dihydrate is used as an excipient for the preparation of tablets or capsules.

**Homoeopathy.** Calcium sulfate has been used in homoeopathic medicines under the following names: Calcium sulfuricum; Calcarea sulphurica; Cal. sul.

### Preparations
**Proprietary Preparations** (details are given in Part 3)
***Austral.:*** Celloids CS 36.

## Dried Calcium Sulfate
Calcii Sulfas Hemihydricus; Calcined Gypsum; Calcium Sulfuricum ad Usum Chirurgicum; Calcium Sulphuricum Ustum; Dried Calcium Sulphate; Exsiccated Calcium Sulphate; Gebrannter Gips; Gêsso; Gypsum Siccatum; Plaster of Paris; Plâtre Cuit; Síran vápenatý hemihydrát; Sulfato cálcico anhidro; Sulphate of Lime; Yeso Blanco.

$CaSO_4,½H_2O$ = 145.1.
*CAS — 10034-76-1 (calcium sulfate hemihydrate); 26499-65-0 (calcium sulfate hemihydrate).*

**Pharmacopoeias.** In *Br.*, *Chin.*, *Ger.*, *Jpn*, *Pol.*, and *Viet.*
**BP 2008** (Dried Calcium Sulphate). A white or almost white, odourless or almost odourless hygroscopic powder. It may contain suitable setting accelerators or decelerators. Slightly soluble in water; more soluble in dilute mineral acids; practically insoluble in alcohol.
The BP gives Exsiccated Calcium Sulphate and Plaster of Paris as approved synonyms.

### Profile
Dried calcium sulfate is used for the preparation of Plaster of Paris Bandage, which is used for the immobilisation of limbs and fractures. It is also employed for making dental casts and has been used as a bone graft substitute.

### Preparations
**Proprietary Preparations** (details are given in Part 3)
***Fr.:*** Biplatrix.

## Calendula
Caléndula; Calendulae Anthodium; Calendulae flos; Gold-bloom; Kehäkukka; Körömvirág; Koszyczek nagietka; Marigold; Marybud; Medetkų žiedai; Měsíčkový květ; Pot Marigold; Ringblomma; Souci.

**Pharmacopoeias.** In *Eur.* (see p.vii).
**Ph. Eur. 6.2** (Calendula Flower). It consists of the whole or cut, dried, and fully opened flowers which have been detached from the receptacle of the cultivated, double-flowered varieties of *Calendula officinalis*. It contains not less than 0.4% of flavonoids, calculated as hyperoside ($C_{21}H_{20}O_{12}$ = 464.4) calculated with reference to the dried drug. Protect from light.

### Profile
Calendula has antiseptic, anti-inflammatory, and astringent properties. It is used in external preparations for minor skin disorders, and also internally for gastrointestinal and menstrual disorders. Calendula is also included in numerous herbal preparations to improve their appearance.

Calendula oil is also used.

**Homoeopathy.** Calendula has been used in homoeopathic medicines under the following names: Calendula officinalis; Calend.

### Preparations
**Proprietary Preparations** (details are given in Part 3)
***Cz.:*** Calendumed†; Dr Theiss Ringelblumen Salbe; Gallentee†; Mesickovy; ***Fr.:*** Calendulene; ***Mex.:*** Cicadin; ***Pol.:*** Calendulin; ***UK:*** Calendolon.

**Multi-ingredient:** ***Arg.:*** Acnetrol; Banoftal†; Brunavera; Bushi; Controlacne; Eurocolor Post Solar; Europrotec Post Solar†; Lavandula Oligoplex; Odontobiotic†; ***Austral.:*** Eczema Relief; Galium Complex†; Nappy Rash Relief Cream; Skin Healing Cream†; ***Austria:*** The Chambard-Tee; ***Braz.:*** Calendula Concreta†; Malvatricin Natural; ***Chile:*** Homeoplasmina†; Matikomp; ***Cz.:*** Abfuhr-Heilkrautertee†; Blahungstee N†; Blasen- und Nierentee†; Cicaderma; Epilobin; Hertz- und Kreislauftee†; Homeovox; ***Fr.:*** Alkagin; Cicaderma; Cicatridine; Dioptec; Eryange†; Hemorrogel; Homeoplasmine; ***Ger.:*** Befelka-Oel; bioplant-Kamillenfluid†; Cefawell†; Nephronorm med†; Unguentum lymphaticum; ***Hong Kong:*** Calmiderm; Pregnacare; ***Ital.:*** Alkagin; Allerlux; Babygella; Decon Ovuli; Leniroset†; Nevril; Proctopure; ***Malaysia:*** Arnica Comp†; Natberry Extra; ***Mex.:*** Sanicut; Suavene; Supranettes Naturalag; ***Philipp.:*** Lactaderm; ***Pol.:*** Arcalen; Azucalen; Dyspepsin; Escalar; Mucosit; Reumosol; Sanofil; ***Port.:*** Alkagin; Cicaderma; ***S.Afr.:*** Arnica Massage Oil; Heilsalbe; Oleum Rhinale Nasal Oil; Wecesin; ***Spain:*** Banoftal; Menstrunat†; ***Switz.:*** Gel a la consoude; Keppur; Kytta Gel†; Onguent aux herbes Keller; Urinex; Wala Echinacea; Wecesin†; Ziegella; ***UK:*** Calendula Nappy Change Cream; Eucanol; Massage Balm with Calendula; ***USA:*** Nasal-Ease; ***Venez.:*** Andantol Jalea; Biomicovo†; Flucirac; Gelsem; Linfoderm; Supranettes†.

## Calumba
Calumba Root; Colombo.

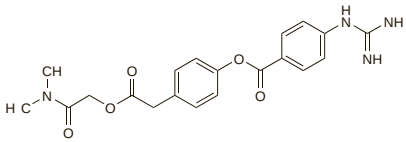
**Pharmacopoeias.** In *Jpn.*

### Profile
Calumba, the dried root of *Jateorhiza palmata* (*J. columba*) (Menispermaceae), has been used as a bitter and as a flavour.

### Preparations
**Proprietary Preparations** (details are given in Part 3)
**Multi-ingredient:** ***Switz.:*** Padma-Lax; Padmed Laxan; ***UK:*** Appetiser Mixture; Pegina.

## Camostat Mesilate *(pINNM)*
Camostat, Mésilate de; Camostat Mesylate; Camostati Mesilas; FOY-305; Mesilato de camostat. *N,N*-Dimethylcarbamoylmethyl 4-(4-guanidinobenzoyloxy)phenylacetate methanesulphonate.

Камостата Мезилат
$C_{20}H_{22}N_4O_5,CH_4O_3S$ = 494.5.
*CAS — 59721-28-7 (camostat); 59721-29-8 (camostat mesilate).*
*ATC — B02AB04.*
*ATC Vet — QB02AB04.*



*(camostat)*

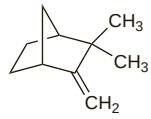
**Pharmacopoeias.** In *Jpn.*

### Profile
Camostat mesilate is a proteolytic enzyme inhibitor that has been given orally for the treatment of postoperative reflux oesophagitis (p.1696) in a dose of 100 mg 3 times daily, and for remission of the acute symptoms of chronic pancreatitis (p.2361) in a dose of 200 mg 3 times daily.

### Preparations
**Proprietary Preparations** (details are given in Part 3)
***Jpn:*** Foipan.

## Camphene
Kamfen. 2,2-Dimethyl-3-methylenebicyclo[2.2.1]heptane; .

Камфен
$C_{10}H_{16}$ = 136.2.
*CAS — 79-92-5;.*

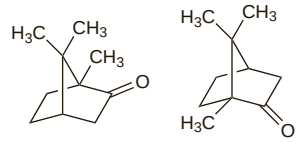


### Profile
Camphene is a constituent of several essential oils. It has antiseptic and antispasmodic actions and is included in preparations for the treatment of biliary- and urinary-tract disorders.

### Preparations
**Proprietary Preparations** (details are given in Part 3)
**Multi-ingredient:** ***Austria:*** Rowachol; Rowatinex; ***Braz.:*** Quelodin†; ***Chile:*** Rowatinex; ***Cz.:*** Rowachol; Rowatinex; ***Ger.:*** Rowachol; Rowachol comp†; Rowachol-Digestiv; Rowatinex; ***Hong Kong:*** Neo-Rowachol; Neo-Rowatinex; Rowachol; Rowatinex; ***Hung.:*** Rowachol; Rowatinex; ***Irl.:*** Rowachol; Rowatinex; ***Israel:*** Rowachol; Rowatinex; ***Malaysia:*** Rowachol; Rowatinex; ***Mex.:*** Cholex; ***Philipp.:*** Rowachol; Rowatinex; ***Pol.:*** Rowachol; Rowatinex; Terpichol; ***Spain:*** Rowachol; Rowanefrin; ***Switz.:*** Rowachol; ***Thai.:*** Rowachol; Rowatinex; ***UK:*** Rowachol; ***Venez.:*** Rowachol; Rowatinex.

## Camphor
Alcanfor; 2-Camphanone; D-Camphor (natural); Camphora; Camphora D; Camphre; Camphre Droit (natural); Camphre du Japon (natural); Cânfora; D-Kafr; Kafr; Kamfer; Kamferi; Kámfor; Kamfora; Kamparas. Bornan-2-one; 1,7,7-Trimethylbicyclo[2.2.1]heptan-2-one.

$C_{10}H_{16}O$ = 152.2.
*CAS — 76-22-2 (± camphor); 21368-68-3 (± camphor); 464-49-3 (+ camphor); 464-48-2 (– camphor).*
*ATC — C01EB02.*
*ATC Vet — QC01EB02.*



l-form d-form

**Pharmacopoeias.** In *Chin.*, *Eur.* (see p.vii), *Jpn*, *US*, and *Viet.*; some only describe natural camphor and some only synthetic camphor; *Eur.* and *Jpn* have separate monographs for natural and racemic or synthetic camphor.
**Ph. Eur. 6.2** (Camphor, Racemic). A white or almost white, crystalline powder or friable crystalline masses, highly volatile even at room temperature. Slightly soluble in water; very soluble in alcohol and in petroleum spirit; very slightly soluble in glycerol; freely soluble in fatty oils.
**Ph. Eur. 6.2** (D-Camphor; Natural Camphor BP 2008). A white or almost white, crystalline powder or friable crystalline masses, highly volatile even at room temperature. Slightly soluble in water; very soluble in alcohol and in petroleum spirit; very slightly soluble in glycerol; freely soluble in fatty oils.
**USP 31** (Camphor). A ketone obtained from *Cinnamomum camphora* (Lauraceae) or produced synthetically. The natural product is dextrorotatory and the synthetic product is optically inactive.
Colourless or white crystals, granules, or crystalline masses, or colourless to white, translucent, tough masses with a penetrating characteristic odour. It slowly volatilises at ordinary temperatures.
Soluble 1 in 800 of water, 1 in 1 of alcohol, 1 in 0.5 of chloroform, and 1 in 1 of ether; freely soluble in carbon disulfide, in petroleum spirit, and in fixed and volatile oils. Store at a temperature not exceeding 40° in airtight containers.

**Compounding.** A liquid or soft mass is formed when camphor is triturated with cloral hydrate, menthol, phenol, and many other substances. Camphor is readily powdered by triturating with a few drops of alcohol, ether, or chloroform.

### Adverse Effects
In addition to accidental ingestion of preparations containing camphor, poisoning has also occurred after giving camphorated oil (camphor liniment) to children in mistake for castor oil. The symptoms include nausea, vomiting, epigastric pain, headache, dizziness, oropharyngeal burning, delirium, muscle twitching, epileptiform convulsions, depression of the CNS, and coma. Breathing is difficult and the breath has a characteristic odour; anuria may occur. Death from respiratory failure or status epilepticus may occur; fatalities in children have been recorded from 1 g. There have been reports of instant collapse in infants following the local application of camphor to their nostrils.

### Treatment of Adverse Effects
Supportive care, including anticonvulsant therapy, is the mainstay of treatment of camphor intoxication. Gastric lavage may be considered if the patient presents within 1 hour of ingestion; any convulsions must be controlled first. Activated charcoal may be given orally. Haemodialysis with a lipid dialysate or haemoperfusion have been tried but are of doubtful value.

### Precautions
Camphor should not be applied to the nostrils of infants even in small quantities, as this may cause immediate collapse.

◊ The UK Committee on the Review of Medicines[1] recommended that camphor should not be included in products intended for the treatment of hepatic and biliary disorders, gallstones, colic, renal disorders, urinary-tract infections, or ureteral stones. The use of camphor parenterally or as irrigants was considered undesirable due to the associated safety hazard.

1. Anonymous. Camphorated oil: licensing authority takes action on camphor products. *Pharm J* 1984; **232:** 792.

### Pharmacokinetics
Camphor is readily absorbed from all administration sites. It is hydroxylated in the liver to yield hydroxycamphor metabolites which are then conjugated with glucuronic acid and excreted in the urine. Camphor crosses the placenta.

◊ For reference to a study on the dermal absorption of camphor, menthol, and methyl salicylate, see Menthol, p.2340.

### Uses and Administration
Applied externally, camphor acts as a rubefacient and mild analgesic (see p.5) and is used in liniments as a counter-irritant in fibrositis, neuralgia, and similar conditions. It is also an ingredient of many inhaled nasal decongestant preparations but it is of doubtful efficacy. The use of camphor liniment (camphorated oil) is discouraged because of its potential toxicity. It has been withdrawn from the market in both the UK and the USA. In the USA the concentration of camphor in preparations for external use may not exceed 11%.

Camphor oil is occasionally used in aromatherapy.