Profile
Carazolol is a beta blocker (p.1225) that has been given orally in the management of various cardiovascular disorders.

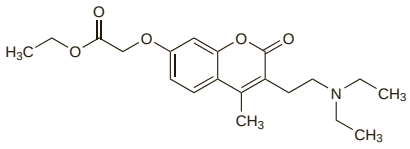
Preparations

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

Carbocromen Hydrochloride *(rINNM)*

A-27053; AG-3; Carbocromène, Chlorhydrate de; Carbocromeni Hydrochloridum; Cassella-4489; Chromonar Hydrochloride *(USAN)*; Hidrocloruro de carbocromeno; NSC-110430. Ethyl 3-(2-diethylaminoethyl)-4-methylcoumarin-7-yloxyacetate hydrochloride.

Карбокромена Гидрохлорид
$C_{20}H_{27}NO_5$,HCl = 397.9.
CAS — 804-10-4 (carbocromen); 655-35-6 (carbocromen hydrochloride).
ATC — C01DX05.
ATC Vet — QC01DX05.



(carbocromen)

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

Carperitide *(USAN, rINN)* ⊗

Carperitida; Carpéritide; Carperitidum; SUN-4936.

Карперитид
CAS — 89213-87-6.

Profile
Carperitide is a recombinant atrial natriuretic peptide (see p.1347) used in the management of acute heart failure.

◊ References.

1. Suwa M, *et al.* Multicenter prospective investigation on efficacy and safety of carperitide for acute heart failure in the 'real world' of therapy. *Circ J* 2005; **69:** 283–90.

Preparations

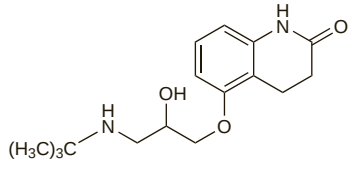
Proprietary Preparations (details are given in Part 3)
Jpn: Hanp.

Carteolol Hydrochloride

(BANM, USAN, rINNM) ⊗

Abbott-43326; Cartéolol, chlorhydrate de; Carteololi hydrochloridum; Hidrocloruro de carteolol; Karteolol Hidroklorür; Karteolol-hidroklorid; Karteolol-hydrochlorid; Karteololhydroklorid; Karteololihydrokloridi; Karteololio hidrochloridas; OPC-1085. 5-(3-*tert*-Butylamino-2-hydroxypropoxy)-3,4-dihydroquinolin-2(1*H*)-one hydrochloride.

Картеолола Гидрохлорид
$C_{16}H_{24}N_2O_3$,HCl = 328.8.
CAS — 51781-06-7 (carteolol); 51781-21-6 (carteolol hydrochloride).
ATC — C07AA15; S01ED05.
ATC Vet — QC07AA15; QS01ED05.



(carteolol)

Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), *Jpn*, and *US*.
Ph. Eur. 6.2 (Carteolol Hydrochloride). White or almost white crystals or crystalline powder. Soluble in water; slightly soluble in alcohol; practically insoluble in dichloromethane; sparingly soluble in methyl alcohol. A 1% solution in water has a pH of 5.0 to 6.0. Store in airtight containers.
USP 31 (Carteolol Hydrochloride). pH of a 1% solution in water is between 5.0 and 6.0.

Adverse Effects, Treatment, and Precautions

As for Beta Blockers, p.1226.

Interactions

The interactions associated with beta blockers are discussed on p.1228.

Pharmacokinetics

Carteolol is well absorbed from the gastrointestinal tract with a peak plasma concentration being reached within 1 to 4 hours of oral doses. The bioavailability is about 84%. It has low lipid solubility. About 20 to 30% is protein bound. The plasma half-life is reported to be 3 to 6 hours. The major route of elimination is renal with 50 to 70% of a dose being excreted unchanged in the urine; carteolol therefore accumulates in patients with renal disease. Major metabolites are 8-hydroxycarteolol and glucuronic acid conjugates of carteolol and 8-hydroxycarteolol. The 8-hydroxycarteolol metabolite is active; its half-life is reported to be 8 to 12 hours.

Uses and Administration

Carteolol is a non-cardioselective beta blocker (see p.1225). It is reported to possess intrinsic sympathomimetic activity but lacks significant membrane-stabilising activity.

Carteolol is used as the hydrochloride in the management of glaucoma (p.1873), hypertension (p.1171), and some cardiac disorders such as angina pectoris (p.1157) and cardiac arrhythmias (p.1160).

Eye drops containing carteolol hydrochloride 1% or 2% are instilled twice daily to reduce raised intra-ocular pressure in open-angle **glaucoma** and ocular hypertension.

In **hypertension** carteolol hydrochloride is given orally in a usual dose range of 2.5 to 20 mg daily, adjusted according to response, although up to 40 mg daily has been given. In cardiac disorders such as **angina pectoris** and **arrhythmias** carteolol hydrochloride has been used in doses of up to 30 mg daily.

The oral dose of carteolol hydrochloride should be reduced in patients with renal impairment (see below).

◊ Reviews.

1. Chrisp P, Sorkin EM. Ocular carteolol: a review of its pharmacological properties, and therapeutic use in glaucoma and ocular hypertension. *Drugs Aging* 1992; **2:** 58–77. Correction. *ibid.* 1994; **4:** 62.

Administration in renal impairment. The oral dose of carteolol hydrochloride should be reduced in patients with renal impairment. A suggested regimen based on creatine clearance (CC) for patients with hypertension is as follows:

- CC 30 to 80 mL/minute: 10 mg daily
- CC less than 30 mL/minute: use not recommended

Preparations

BP 2008: Carteolol Eye Drops;
USP 31: Carteolol Hydrochloride Ophthalmic Solution; Carteolol Hydrochloride Tablets.

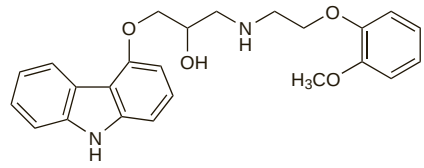
Proprietary Preparations (details are given in Part 3)
Arg.: Elebloc; Glacout; Glauteolol; Poenglaucol; Singlauc; Tenoftal†; ***Austria:*** Arteoptic; Endak; ***Belg.:*** Arteoptic; Carteol; ***Cz.:*** Arteoptic; Carteol; ***Denm.:*** Arteoptic†; ***Fin.:*** Arteoptic†; ***Fr.:*** Carteabak; Carteol; Mikelan; ***Ger.:*** Arteoptic; Endak; ***Gr.:*** Carteodose†; Fortinol; Napolit†; Vinitus; Zymoptic†; ***Hong Kong:*** Arteoptic; ***Hung.:*** Arteoptic†; ***Irl.:*** Teoptic; ***Ital.:*** Carteol; ***Jpn:*** Mikelan; ***Neth.:*** Arteoptic; Carteabak; Teoptic; ***Philipp.:*** Mikelan; ***Pol.:*** Arteoptic; ***Port.:*** Arteoptic; Carteabak; Physioglau; ***S.Afr.:*** Mikelan†; Teoptic; ***Spain:*** Arteolol; Elebloc; Mikelan; ***Swed.:*** Arteoptic†; ***Switz.:*** Arteoptic; ***Thai.:*** Arteoptic; ***Turk.:*** Carteol; ***UK:*** Teoptic; ***USA:*** Cartrol; Ocupress†.

Multi-ingredient: ***Belg.:*** Carteopil; ***Fr.:*** Carpilo; ***Switz.:*** Arteopilo.

Carvedilol *(BAN, USAN, rINN)* ⊗

BM-14190; Carvédilol; Carvedilolum; Karvedilol; Karvediloli; Karvedilolis. 1-Carbazol-4-yloxy-3-[2-(2-methoxyphenoxy)ethylamino]propan-2-ol.

Карведилол
$C_{24}H_{26}N_2O_4$ = 406.5.
CAS — 72956-09-3.
ATC — C07AG02.
ATC Vet — QC07AG02.



Pharmacopoeias. In *Eur.* (see p.vii).
Ph. Eur. 6.2 (Carvedilol). A white or almost white crystalline powder. It exhibits polymorphism. Practically insoluble in water; slightly soluble in alcohol; practically insoluble in dilute acids.

Adverse Effects, Treatment, and Precautions

As for Beta Blockers, p.1226.

Liver function abnormalities, reversible on stopping treatment with carvedilol, have been reported rarely. Carvedilol is extensively metabolised in the liver and is not recommended in patients with hepatic impairment. Acute renal failure and renal abnormalities have been reported in patients with heart failure who also suffered from diffuse vascular disease and/or renal impairment.

The risk of hypotension may be reduced by taking carvedilol with food to decrease the rate of absorption.

Effects on the liver. Pruritus and elevated serum transaminase concentrations occurred[1] in a man who had been taking carvedilol for 6 months. Liver function tests returned to normal within 3 weeks of stopping carvedilol. However, pruritus recurred when the patient was started on metoprolol about 1 year later.

1. Hagmeyer KO, Stein J. Hepatotoxicity associated with carvedilol. *Ann Pharmacother* 2001; **35:** 1364–6.

Interactions

The interactions associated with beta blockers are discussed on p.1228.

Pharmacokinetics

Carvedilol is well absorbed from the gastrointestinal tract but is subject to considerable first-pass metabolism in the liver; the absolute bioavailability is about 25%. Peak plasma concentrations occur 1 to 2 hours after an oral dose. It has high lipid solubility. Carvedilol is more than 98% bound to plasma proteins. It is extensively metabolised in the liver, primarily by the cytochrome P450 isoenzymes CYP2D6 and CYP2C9, and the metabolites are excreted mainly in the bile. The elimination half-life is about 6 to 10 hours. Carvedilol has been shown to accumulate in breast milk in *animals*.

◊ References.

1. McTavish D, *et al.* Carvedilol: a review of its pharmacodynamic and pharmacokinetic properties, and therapeutic efficacy. *Drugs* 1993; **45:** 232–58.
2. Morgan T. Clinical pharmacokinetics and pharmacodynamics of carvedilol. *Clin Pharmacokinet* 1994; **26:** 335–46.
3. Tenero D, *et al.* Steady-state pharmacokinetics of carvedilol and its enantiomers in patients with congestive heart failure. *J Clin Pharmacol* 2000; **40:** 844–53.

Uses and Administration

Carvedilol is a non-cardioselective beta blocker (p.1225). It has vasodilating properties, which are attributed mainly to its blocking activity at alpha$_1$ receptors; at higher doses calcium-channel blocking activity may contribute. It also has antioxidant properties. Carvedilol is reported to have no intrinsic sympathomimetic activity and only weak membrane-stabilising activity.

Carvedilol is used in the management of hypertension (p.1171) and angina pectoris (p.1157), and as an adjunct to standard therapy in symptomatic heart failure

(p.1165). It is also used to reduce mortality in patients with left ventricular dysfunction after myocardial infarction.

In **hypertension** carvedilol is given in an initial oral dose of 12.5 mg once daily, increased after two days to 25 mg once daily. Alternatively, an initial dose of 6.25 mg is given twice daily, increased after one to two weeks to 12.5 mg twice daily. The dose may be increased further, if necessary, at intervals of at least two weeks, to 50 mg once daily or in divided doses. A dose of 12.5 mg once daily may be adequate for elderly patients.

In **angina pectoris** an initial oral dose of 12.5 mg is given twice daily, increased after two days to 25 mg twice daily.

In **heart failure**, the initial oral dose is 3.125 mg twice daily. It should be taken with food to reduce the risk of hypotension. If tolerated, the dose should be doubled after two weeks to 6.25 mg twice daily and then increased gradually, at intervals of not less than two weeks, to the maximum dose tolerated; this should not exceed 25 mg twice daily in patients with severe heart failure or in those weighing less than 85 kg, or 50 mg twice daily in patients with mild to moderate heart failure weighing more than 85 kg. For doses in children, see below.

In patients with **left ventricular dysfunction after myocardial infarction**, the initial dose is 6.25 mg twice daily, increased after 3 to 10 days, if tolerated, to 12.5 mg twice daily and then to a target dose of 25 mg twice daily. A lower initial dose may be used in symptomatic patients.

A controlled-release preparation containing carvedilol phosphate hemihydrate is available in some countries.

◊ References.

1. Ruffolo RR, *et al.* The pharmacology of carvedilol. *Eur J Clin Pharmacol* 1990; **38:** S82–S88.
2. McTavish D, *et al.* Carvedilol: a review of its pharmacodynamic and pharmacokinetic properties, and therapeutic efficacy. *Drugs* 1993: **45:** 232–58.
3. Morgan T. Clinical pharmacokinetics and pharmacodynamics of carvedilol. *Clin Pharmacokinet* 1994; **26:** 335–46.
4. Louis WJ, *et al.* A risk-benefit assessment of carvedilol in the treatment of cardiovascular disorders. *Drug Safety* 1994; **11:** 86–93.
5. Dunn CJ, *et al.* Carvedilol: a reappraisal of its pharmacological properties and therapeutic use in cardiovascular disorders. *Drugs* 1997; **54:** 161–85.
6. Frishman WH. Carvedilol. *N Engl J Med* 1998; **339:** 1759–65.
7. Keating GM, Jarvis B. Carvedilol: a review of its use in chronic heart failure. *Drugs* 2003; **63:** 1697–1741.
8. Naccarelli GV, Lukas MA. Carvedilol's antiarrhythmic properties: therapeutic implications in patients with left ventricular dysfunction. *Clin Cardiol* 2005; **28:** 165–73.

Administration in children. Carvedilol has been used in children with heart failure, although experience is limited.[1] Beneficial effects have been reported, including improvement in symptoms and ejection fraction, and delaying the need for heart transplantation, and carvedilol appears to be well tolerated. Doses used have varied, with initial oral doses ranging from 10 to 180 micrograms/kg daily and average oral maintenance doses ranging from 200 to 700 micrograms/kg (maximum 50 mg) daily, usually given in two divided doses. However, a randomised study[2] in 161 children and adolescents with heart failure found that carvedilol was not significantly better than placebo: clinical improvement occurred in 56% of those taking carvedilol and 56% of those taking placebo.

In the UK, the *BNFC* recommends that children aged 2 to 18 years with heart failure may be given an initial oral dose of 50 micrograms/kg (maximum 3.125 mg) twice daily, increased as tolerated, by doubling the dose at intervals of at least 2 weeks, to a maintenance dose of 350 micrograms/kg (maximum 25 mg) twice daily.

1. Greenway SC, Benson LN. The use of carvedilol in pediatric heart failure. *Cardiovasc Hematol Disord Drug Targets* 2006; **6:** 35–42.
2. Shaddy RE, *et al.* Carvedilol for children and adolescents with heart failure: a randomized controlled trial. *JAMA* 2007; **298:** 1171–9.

Administration in the elderly. Licensed product information for carvedilol recommends an initial dose of 12.5 mg daily for all adults with hypertension. A study in 16 elderly hypertensive patients (mean age 70 years) given single doses of 12.5 mg and 25 mg found a high incidence of orthostatic hypotension[1] and the authors suggested that a starting dose lower than 12.5 mg may be necessary in elderly patients.

A retrospective study[2] found that standard initial doses for heart failure (see Uses and Administration, above) were well tolerated in elderly patients and that the mean achieved dose was similar in those aged under 70 years and those aged 70 years and older, after adjustment for weight. Adverse effects were more common in the older group, but could generally be managed without stopping carvedilol.

1. Krum H, *et al.* Postural hypotension in elderly patients given carvedilol. *BMJ* 1994; **309:** 775–6.
2. Lawless CE, *et al.* Titration of carvedilol in elderly heart failure patients. *Am J Geriatr Cardiol* 2005; **14:** 230–5.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Antibloc; Bidecar; Carvedil; Carvel†; Corafen; Coritensil; Corubin; Dilatrend; Duobloc; Filten; Hipoten; Isobloc; Kollosteril; Rodipal; Rudoxil; Veraten; Vicardol; ***Austral.:*** Dilatrend; Kredex; ***Austria:*** Dilatrend; Hybridil; ***Belg.:*** Dimitone; Kredex; ***Braz.:*** Cardilol; Carvedilat; Coreg; Dilatrend†; Divelol; Ictus; Karvil; ***Canad.:*** Coreg; ***Chile:*** Betaplex; Blocar; Dilatrend; Dualten; Lodipres; Novocar†; Off-Ten; ***Cz.:*** Apo-Carve; Atram; Carvedigamma; Carvesan; Carvetrend; Coryol; Dilatrend; Talliton; ***Denm.:*** Carvetone; Dimitone; ***Fin.:*** Cardiol; ***Fr.:*** Kredex; ***Ger.:*** CarLich; Carve; Carve-Q; Carvecard; Carvedigamma; Dilatrend; Dimetil; Querto; ***Gr.:*** Carvedilen; Carvepen; Dilatrend; ***Hong Kong:*** Dilatrend; ***Hung.:*** Carvedigamma; Carvol; Coryol; Dilatrend; Talliton; ***India:*** Carloc; Carvil; Cevas; ***Indon.:*** Carbloxal; Dilbloc; V-Bloc; ***Irl.:*** Biocard; Eucardic; ***Israel:*** Carvedexxon; Dimitone; ***Ital.:*** Carvipress; Colver; Dilatrend; Dilocar; ***Malaysia:*** Caslot; Cavel; Dilatrend; ***Mex.:*** Dilatrend; ***Neth.:*** Eucardic; ***Norw.:*** Kredex; ***NZ:*** Dilatrend; ***Philipp.:*** Dilatrend; ***Pol.:*** Atram; Carvedigamma; Carvetrend; Coryol; Dilatrend; Vivacor; ***Port.:*** Dilbloc; ***Rus.:*** Acridilole (Акридилол); Cardivas (Кардивас); Carvetrend (Карветренд); Carvidil (Карвидил); Coryol (Корионл); Talliton (Таллитон); ***S.Afr.:*** Carloc; Carvetrend; Dilatrend; ***Singapore:*** Dilatrend; ***Spain:*** Coropres; ***Swed.:*** Kredex; ***Switz.:*** Dilatrend; ***Thai.:*** Dilatrend; ***Turk.:*** Dilatrend; ***UK:*** Eucardic; ***USA:*** Coreg; ***Venez.:*** Carbatil; Carvedil; Coventrol; Dilatrend.

Multi-ingredient: ***Arg.:*** Carvedil D; ***Austria:*** Co-Dilatrend; Dilaplus.

Celiprolol Hydrochloride

(BANM, USAN, rINNM) ⊗

Céliprolol, chlorhydrate de; Celiprolol-hydrochlorid; Celiprolol-hydroklorid; Celiprololi hydrochloridum; Celiprololio hidrochloridas; Celiprololu chlorowodorek; Hidrocloruro de celiprolol; Seliprololihydrokloridi. 3-{3-Acetyl-4-[3-(*tert*-butylamino)-2-hydroxypropoxy]phenyl}-1,1-diethylurea hydrochloride.

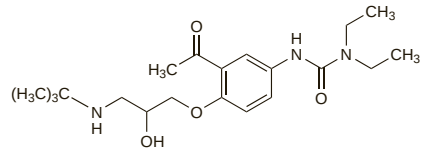
Целипролола Гидрохлорид

$C_{20}H_{33}N_3O_4$,HCl = 416.0.

CAS — 56980-93-9 (celiprolol); 57470-78-7 (celiprolol hydrochloride).

ATC — C07AB08.

ATC Vet — QC07AB08.



(celiprolol)

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

Ph. Eur. 6.2 (Celiprolol Hydrochloride). A white or very slightly yellow, crystalline powder. It exhibits polymorphism. Freely soluble in water and in methyl alcohol; soluble in alcohol; very slightly soluble in dichloromethane. Protect from light.

Adverse Effects, Treatment, and Precautions

As for Beta Blockers, p.1226.

Tremor and palpitations associated with intrinsic sympathomimetic activity at $beta_2$ receptors have been reported.

Interactions

The interactions associated with beta blockers are discussed on p.1228.

Pharmacokinetics

Celiprolol is absorbed from the gastrointestinal tract in a non-linear fashion; the percentage of the dose absorbed increases with increasing dose. The plasma elimination half-life is about 5 to 6 hours. Celiprolol crosses the placenta. It has low lipid solubility and is about 25% bound to plasma proteins. Metabolism is minimal and celiprolol is mainly excreted unchanged in the urine and faeces.

Uses and Administration

Celiprolol is a cardioselective beta blocker (p.1225). It is reported to possess intrinsic sympathomimetic activity and direct vasodilator activity. Celiprolol is used as the hydrochloride in the management of hypertension (p.1171) and angina pectoris (p.1157). The usual oral dose of celiprolol hydrochloride is 200 to 400 mg once daily before food. Reduced doses may be required in patients with renal impairment (see below).

◊ References.

1. Milne RJ, Buckley MM-T. Celiprolol: an updated review of its pharmacodynamic and pharmacokinetic properties, and therapeutic efficacy in cardiovascular disease. *Drugs* 1991; **41:** 941–69.
2. Anonymous. Celiprolol: theory and practice. *Lancet* 1991; **338:** 1426–7.
3. Anonymous. Celiprolol—a better beta blocker? *Drug Ther Bull* 1992; **30:** 35–6.
4. Kendall MJ, Rajman I. A risk-benefit assessment of celiprolol in the treatment of cardiovascular disease. *Drug Safety* 1994; **10:** 220–32.
5. Riddell J. Drugs in focus 18: celiprolol. *Prescribers' J* 1996; **36:** 165–8.

Administration in renal impairment. Celiprolol should not be given to patients with a creatinine clearance (CC) of less than 15 mL/minute. Patients with a CC between 15 and 40 mL/minute may be given 100 to 200 mg daily.

Preparations

BP 2008: Celiprolol Tablets.

Proprietary Preparations (details are given in Part 3)
Austria: Selectol; ***Belg.:*** Selectol; ***Chile:*** Selectol; ***Cz.:*** Celectol†; Tenoloc; ***Fin.:*** Selectol; ***Fr.:*** Celectol; ***Ger.:*** Celip; Celipro; Celiprogamma; Selectol; ***Gr.:*** Aplonit; Selectol; Versatil; ***Hong Kong:*** Selectol; ***Irl.:*** Selectol; ***Ital.:*** Cordiax; ***Jpn:*** Selectol; ***Neth.:*** Dilanorm; ***NZ:*** Celol; ***Pol.:*** Celipres; ***Spain:*** Cardem; ***Switz.:*** Selectol; ***UK:*** Celectol.

Multi-ingredient: ***Austria:*** Selecturon.

Certoparin Sodium *(BAN, rINN)*

Certoparin; Certoparina sódica; Certoparine Sodique; Certoparinum Natricum.

Цертопарин Натрий

Description. Certoparin sodium is prepared by amyl nitrite degradation of heparin obtained from the intestinal mucosa of pigs. The majority of the components have a 2-*O*-sulfo-α-L-idopyranosuronic acid structure at the non-reducing end and a 6-*O*-sulfo-2,5-anhydro-D-mannose structure at the reducing end of their chain. The molecular weight of 70% of the components is less than 10 000 and the average molecular weight is about 6000. The degree of sulfation is about 2 to 2.5 per disaccharide unit.

Units

As for Low-molecular-weight Heparins, p.1329.

Adverse Effects, Treatment, and Precautions

As for Low-molecular-weight Heparins, p.1329.

Severe bleeding with certoparin may be reduced by the slow intravenous injection of protamine salts; 1 mg of protamine hydrochloride is stated to inhibit the effects of 80 to 120 units of certoparin sodium.

Interactions

As for Low-molecular-weight Heparins, p.1329.

Pharmacokinetics

Certoparin sodium is rapidly and completely absorbed after subcutaneous injection. Peak plasma activity is reached within 2 to 4 hours. The half-life of anti-factor Xa activity is about 4 hours.

Uses and Administration

Certoparin sodium is a low-molecular-weight heparin (p.1329) with anticoagulant activity used for the prevention of postoperative venous thromboembolism (p.1189). It is given by subcutaneous injection in a dose of 3000 units 1 to 2 hours before the procedure, followed by 3000 units daily for 7 to 10 days or until the patient is fully ambulant.

◊ References.

1. Kolb G, *et al.* Reduction of venous thromboembolism following prolonged prophylaxis with the low molecular weight heparin certoparin after endoprothetic joint replacement or osteosynthesis of the lower limb in elderly patients. *Thromb Haemost* 2003; **90:** 1100–5.
2. Riess H, *et al.* Fixed-dose, body weight-independent subcutaneous low molecular weight heparin certoparin compared with adjusted-dose intravenous unfractionated heparin in patients with proximal deep venous thrombosis. *Thromb Haemost* 2003; **90:** 252–9.
3. Diener HC, *et al.* Prophylaxis of thrombotic and embolic events in acute ischemic stroke with the low-molecular-weight heparin certoparin: results of the PROTECT Trial. *Stroke* 2006; **37:** 139–44.
4. Tebbe U, *et al.* AFFECT: a prospective, open-label, multicenter trial to evaluate the feasibility and safety of a short-term treatment with subcutaneous certoparin in patients with persistent non-valvular atrial fibrillation. *Clin Res Cardiol* 2008; **97:** 389–96.

Preparations

Proprietary Preparations (details are given in Part 3)
Austria: Sandoparin; Troparin; ***Cz.:*** Troparin†; ***Ger.:*** Mono-Embolex; ***Hung.:*** Sandoparin†; ***Switz.:*** Sandoparine; ***UK:*** Alphaparin†.

Multi-ingredient: ***Austria:*** Troparin compositum; ***Ger.:*** Embolex NM†.