Breast feeding. For comments on the use of SSRIs in breast feeding patients, see under Precautions for Fluoxetine, p.394.

Children. SSRIs are associated with an increased risk of potentially suicidal behaviour when used for the treatment of depression in children and adolescents under 18 years old; for further details, see under Effects on Mental State in Fluoxetine, p.392.

Interactions

For interactions associated with SSRIs, see Fluoxetine, p.396.

Fluvoxamine can greatly increase plasma concentrations of theophylline (see p.1143), and they should not be given together, or, if this is unavoidable, the dose of theophylline should be halved and plasma-theophylline concentrations monitored more closely.

◊ References.

1. Wagner W, Vause EW. Fluvoxamine: a review of global drug-drug interaction data. *Clin Pharmacokinet* 1995; **29** (suppl 1): 26–32.

Pharmacokinetics

Fluvoxamine is readily absorbed from the gastrointestinal tract with peak plasma concentrations occurring 3 to 8 hours after a dose. Systemic bioavailability does not appear to be affected by food. It is extensively metabolised in the liver by oxidative demethylation and deamination, to inactive metabolites. Excretion is mainly in the urine; about 2% of a dose is excreted as unchanged drug. Fluvoxamine is widely distributed throughout the body and protein binding is reported to be about 80%; it has a plasma-elimination half-life of about 15 hours. Fluvoxamine is distributed into breast milk (see Breast Feeding under Precautions in Fluoxetine, p.394).

◊ References.

1. Perucca E, *et al*. Clinical pharmacokinetics of fluvoxamine. *Clin Pharmacokinet* 1994; **27:** 175–90.
2. van Harten J. Overview of the pharmacokinetics of fluvoxamine. *Clin Pharmacokinet* 1995; **29** (suppl 1): 1–9.
3. Xu Z-H, *et al*. In vivo inhibition of CYP2C19 but not CYP2D6 by fluvoxamine. *Br J Clin Pharmacol* 1996; **42:** 518–21.
4. DeVane CL, Gill HS. Clinical pharmacokinetics of fluvoxamine: applications to dosage regimen design. *J Clin Psychiatry* 1997; **58** (suppl 5): 7–14.
5. Spigset O, *et al*. Non-linear fluvoxamine disposition. *Br J Clin Pharmacol* 1998; **45:** 257–63.
6. Hiemke C, Härtter S. Pharmacokinetics of selective serotonin re-uptake inhibitors. *Pharmacol Ther* 2000; **85:** 11–28.

Uses and Administration

Fluvoxamine, an aralkylketone derivative, is an SSRI with actions and uses similar to those of fluoxetine (p.397). It is used as the maleate and doses are expressed in terms of this salt.

In the treatment of **depression** fluvoxamine maleate is given in an initial oral dose of 50 or 100 mg once daily, preferably in the evening; in some patients the dose may need to be gradually increased to a maximum of 300 mg daily. It is recommended that daily dosages exceeding 150 mg should be given in 2 or 3 divided doses.

Fluvoxamine maleate is also used in the management of **obsessive-compulsive disorder**. In the UK, doses are similar to those used in the treatment of depression. The recommended starting dose in the USA is 50 mg once daily; this dose may be increased by increments of 50 mg every 4 to 7 days to a maximum of 300 mg daily. Doses above 100 mg daily should be given in 2 divided doses. In both countries the drug may also be used in children aged 8 years and over with obsessive-compulsive disorder. The recommended starting dose is 25 mg once daily, which may be increased in increments of 25 mg every 4 to 7 days to a maximum daily dose of 200 mg (in the USA adolescents over 11 years may be given a maximum dose of 300 mg daily). Daily doses of more than 50 mg should be given as 2 divided doses. It is recommended that if no improvement occurs within 10 weeks, treatment with fluvoxamine should be re-assessed.

In the USA, a modified-release preparation of fluvoxamine maleate is available for the treatment of obsessive-compulsive disorder and **social anxiety disorder** in adults; the initial dose is 100 mg once daily increased, as necessary, to a maximum of 300 mg once daily.

US licensed product information recommends that dosage modification be considered in elderly patients, in whom clearance may be decreased. For dosage in renal and hepatic impairment, see below.

Fluvoxamine should be withdrawn gradually to reduce the risk of withdrawal symptoms.

Administration in hepatic or renal impairment. UK licensed drug information recommends that patients with hepatic or renal impairment should begin therapy with a low dose of fluvoxamine maleate and be carefully monitored; US product information only recommends that dosage modification be considered in hepatic impairment, since it considers evidence of accumulation in renal impairment to be lacking.

Anxiety disorders. Fluvoxamine has been given in a variety of anxiety disorders including obsessive-compulsive disorder (p.952), panic disorder (p.952), and social anxiety disorder (see under Phobic Disorders, p.953).

References.

1. van Vliet IM, *et al*. Psychopharmacological treatment of social phobia: a double blind placebo controlled study with fluvoxamine. *Psychopharmacology (Berl)* 1994; **115:** 128–34.
2. Freeman CPL, *et al.* Fluvoxamine versus clomipramine in the treatment of obsessive compulsive disorder: a multicenter, randomized, double-blind, parallel group comparison. *J Clin Psychiatry* 1994; **55:** 301–5.
3. Greist JH, *et al.* Efficacy of fluvoxamine in obsessive-compulsive disorder: results of a multicentre, double blind, placebo-controlled trial. *Eur J Clin Res* 1995; **7:** 195–204.
4. Stein MB, *et al.* Fluvoxamine treatment of social phobia (social anxiety disorder): a double-blind placebo-controlled study. *Am J Psychiatry* 1999; **156:** 756–60.
5. Figgitt DP, McClellan KJ. Fluvoxamine: an updated review of its use in the management of adults with anxiety disorders. *Drugs* 2000; **60:** 925–54.
6. The Research Unit on Pediatric Psychopharmacology Anxiety Study Group. Fluvoxamine for the treatment of anxiety disorders in children and adolescents. *N Engl J Med* 2001; **344:** 1279–85.
7. Asnis GM, *et al*. Fluvoxamine in the treatment of panic disorder: a multi-center, double-blind, placebo-controlled study in outpatients. *Psychiatry Res* 2001; **103:** 1–14.
8. Hollander E, *et al.* A double-blind, placebo-controlled study of the efficacy and safety of controlled-release fluvoxamine in patients with obsessive-compulsive disorder. *J Clin Psychiatry* 2003; **64:** 640–7.
9. Stein DJ, *et al*. Fluvoxamine CR in the long-term treatment of social anxiety disorder: the 12- to 24-week extension phase of a multicentre, randomized, placebo-controlled trial. *Int J Neuropsychopharmacol* 2003; **6:** 317–23.

Hypochondriasis. For reference to the use of SSRIs, including fluvoxamine, in hypochondriasis, see under Fluoxetine, p.398.

Preparations

BP 2008: Fluvoxamine Tablets;
USP 31: Fluvoxamine Maleate Tablets.

Proprietary Preparations (details are given in Part 3)

Arg.: Luvox†; ***Austral.:*** Faverin; Luvox; Movox; Voxam; ***Austria:*** Felixsan; Floxyfral; ***Belg.:*** Dumirox†; Floxyfral; ***Braz.:*** Luvox; ***Canad.:*** Luvox; ***Chile:*** Luvox; ***Cz.:*** Fevarin; ***Denm.:*** Fevarin; ***Fin.:*** Fevarin; Fluvosol†; ***Fr.:*** Floxyfral; ***Ger.:*** Desifluvoxamin†; Fevarin; Fluvohexal; Fluvoxadura; ***Gr.:*** Dumyrox; Myroxine; ***Hong Kong:*** Faverin; ***Hung.:*** Fevarin; ***India:*** Fluvoxin; Sorest; Uvox; ***Indon.:*** Luvox; ***Irl.:*** Faverin; ***Israel:*** Favoxil; ***Ital.:*** Dumirox; Fevarin; Maveral; ***Jpn:*** Luvox; ***Malaysia:*** Luvox; ***Mex.:*** Luvox; Vumix; ***Neth.:*** Fevarin; ***Norw.:*** Fevarin; ***Philipp.:*** Faverin; ***Pol.:*** Fevarin; ***Port.:*** Dumyrox; ***Rus.:*** Fevarin (Феварин); ***S.Afr.:*** Faverin; Luvox; ***Singapore:*** Faverin; ***Spain:*** Dumirox; ***Swed.:*** Fevarin; ***Switz.:*** Flox-ex; Floxyfral; ***Thai.:*** Faverin; Fluvoxin; ***Turk.:*** Faverin; ***UK:*** Faverin; ***USA:*** Luvox; ***Venez.:*** Luvox.

Imipramine *(BAN, rINN)*

Imipramiini; Imipramin; Imipramina; Imipraminum. 3-(10,11-Dihydro-5*H*-dibenz[*b,f*]azepin-5-yl)propyldimethylamine.

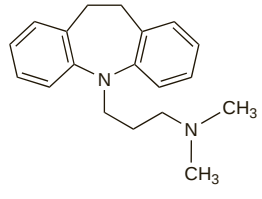
Имипрамин

$C_{19}H_{24}N_2$ = 280.4.

CAS — 50-49-7.

ATC — N06AA02.

ATC Vet — QN06AA02.



Imipramine Embonate *(BANM, rINNM)*

Embonato de imipramina; Imipramine, Embonate d'; Imipramine Pamoate; Imipramini Embonas.

Имипрамина Эмбонат

$(C_{19}H_{24}N_2)_2.C_{23}H_{16}O_6$ = 949.2.

CAS — 10075-24-8.

Imipramine Hydrochloride *(BANM, rINNM)*

Hidrocloruro de imipramina; Imipram. Hydrochlor.; Imipramiinihydrokloridi; Imipramin Hidroklorür; Imipramine, chlorhydrate d'; Imipramin-hidroklorid; Imipramin-hydrochlorid; Imipraminhydroklorid; Imipramini Chloridum; Imipramini hydrochloridum; Imipramino hidrochloridas; Imipraminy chlorowodorek; Imizine.

Имипрамина Гидрохлорид

$C_{19}H_{24}N_2$,HCl = 316.9.

CAS — 113-52-0.

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

Ph. Eur. 6.2 (Imipramine Hydrochloride). A white or slightly yellow crystalline powder. Freely soluble in water and in alcohol. A 10% solution in water has a pH of 3.6 to 5.0. Protect from light.

USP 31 (Imipramine Hydrochloride). A white to off-white, odourless or practically odourless, crystalline powder. Freely soluble in water and in alcohol; soluble in acetone; insoluble in ether and in benzene. Store in airtight containers.

Adverse Effects, Treatment, and Precautions

As for tricyclic antidepressants in general (see Amitriptyline, p.376).

Breast feeding. For comments on the use of tricyclic antidepressants in breast feeding patients, see under Precautions for Amitriptyline, p.378.

Porphyria. Imipramine has been associated with acute attacks of porphyria and is considered unsafe in porphyric patients.

Interactions

For interactions associated with tricyclic antidepressants, see Amitriptyline, p.379.

Pharmacokinetics

Imipramine is readily absorbed from the gastrointestinal tract, and extensively demethylated by first-pass metabolism in the liver, to its primary active metabolite, desipramine.

Paths of metabolism of both imipramine and desipramine include hydroxylation and *N*-oxidation. Imipramine is excreted in the urine, mainly in the form of its metabolites, either free or in conjugated form; small amounts are excreted in the faeces via the bile.

Imipramine and desipramine are widely distributed throughout the body and are extensively bound to plasma and tissue protein. Imipramine has been estimated to have an elimination half-life ranging from 9 to 28 hours, which may be considerably extended in overdosage. Plasma concentrations of imipramine and desipramine vary very widely between individuals but some correlation with therapeutic response has been established.

Imipramine and desipramine cross the blood-brain barrier and placenta and are distributed into breast milk (see Breast Feeding under Precautions in Amitriptyline, p.378).

◊ References.

1. Sallee FR, Pollock BG. Clinical pharmacokinetics of imipramine and desipramine. *Clin Pharmacokinet* 1990; **18:** 346–64.

Uses and Administration

Imipramine is a dibenzazepine tricyclic antidepressant with actions and uses similar to those of amitriptyline (p.381). Imipramine is one of the less sedating tricyclics and has moderate antimuscarinic activity. Imipramine is usually given orally as the hydrochloride or embonate, with doses expressed in terms of the hydrochloride. Imipramine embonate 149.8 mg and imipramine base 88.5 mg are both equivalent to about 100 mg of imipramine hydrochloride.

In the treatment of **depression**, the usual daily dose of imipramine hydrochloride is up to 75 mg in divided doses initially, gradually increased to 150 to 200 mg daily as necessary; higher doses of up to 300 mg daily may be required in severely depressed patients in hospital. A suggested initial dose for the elderly in the UK