

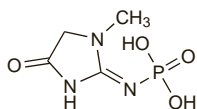
**Fosfocreatinine** (rINN)

Fosfocreatinina; Fosfocreatinine; Fosfocreatininum; Phosphocreatinine. (1-Methyl-4-oxo-2-imidazolidinylidene)phosphoramidic acid.

Фосфокреатинин

$C_4H_8N_3O_4P = 193.1$ .

CAS — 5786-71-0 (fosfocreatinine); 19604-05-8 (fosfocreatinine sodium).

**Profile**

Fosfocreatinine or fosfocreatinine sodium has been used in muscle disorders.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Ital.:** Sustenium.

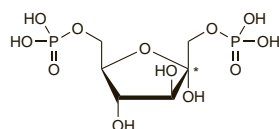
**Fosfructose Trisodium** (USAN, rINNM)

CPC-III; Fosfructosa trisódica; Fosfructose Trisodique; Fosfructosum; Sodium Fructose-1,6-diphosphate. D-Fructose 1,6-bis(hydrogen phosphate) trisodium octahydrate.

Тринатрий Фосфруктоза

$C_6H_{11}Na_3O_{12}P_2 \cdot 8H_2O = 550.2$ .

CAS — 488-69-7 (fosfructose); 6055-82-9 (fosfructose calcium); 38099-82-0 (fosfructose trisodium); 81028-91-3 (fosfructose trisodium octahydrate); ATC — CO1EB07.



(fosfructose)

**Profile**

Fosfructose is a metabolic intermediate. It is used as the trisodium salt as a source of phosphate in deficiency states and in total parenteral nutrition, and has also been used to protect against ischaemic tissue damage. Fosfructose calcium has also been promoted for a variety of disorders.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Hong Kong:** Esafosfina; **Ital.:** Esafosfina; FDP; Frut†; **Thai:** Esafosfina.

**Multi-ingredient:** **Hong Kong:** Esafosfina Glutamica; **Ital.:** Esaglut†.

**Frankincense**

Olibanum; Ru Xiang.

Лада́н

CAS — 8016-36-2 (frankincense oil).

NOTE. Distinguish from Indian Frankincense, below.

**Profile**

Frankincense is the aromatic gum resin of *Boswellia sacra* (*B. carteri*) (Burseraceae) or other species of *Boswellia*. It is used in incense and as a fumigant.

Frankincense (ru xiang) is also used in Chinese medicine. Frankincense oil is used in aromatherapy.

**Indian Frankincense**

Encens indien; Indian Olibanum; Olibanum indicum; Salai Guggal.

NOTE. Indian frankincense is obtained from *Boswellia serrata* and should be distinguished from Frankincense (above) obtained from other species of *Boswellia*.

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

**Ph. Eur. 6.2** (Indian Frankincense). Air-dried gum-resin exudate, obtained by incision in the stem or branches of *Boswellia serrata*. It contains a minimum of 1.0% of 11-keto-β-boswellic acid ( $C_{30}H_{46}O_4 = 470.7$ ) and a minimum of 1.0% of acetyl-11-keto-β-boswellic acid ( $C_{32}H_{48}O_5 = 512.7$ ) calculated with reference to the dried drug.

**Profile**

Indian frankincense is the gum resin of *Boswellia serrata* (*B. glabra*) (Burseraceae). It has anti-inflammatory activity and is included in herbal preparations for musculoskeletal and joint dis-

orders. It is also under investigation for use in inflammatory bowel disease and asthma. Boswellic acids extracted from the gum resin of *B. serrata* have also been tried for their anti-inflammatory actions in similar disorders.

**References.**

- Gupta I, *et al.* Effects of *Boswellia serrata* gum resin in patients with ulcerative colitis. *Eur J Med Res* 1997; **2**: 37–43.
- Gupta I, *et al.* Effects of *Boswellia serrata* gum resin in patients with bronchial asthma: results of a double-blind, placebo-controlled, 6-week clinical study. *Eur J Med Res* 1998; **3**: 511–14.
- Gupta I, *et al.* Effects of gum resin of *Boswellia serrata* in patients with chronic colitis. *Planta Med* 2001; **67**: 391–5.
- Kimmatkar N, *et al.* Efficacy and tolerability of *Boswellia serrata* extract in treatment of osteoarthritis of knee—a randomized double blind placebo controlled trial. *Phytomedicine* 2003; **10**: 3–7.
- Ammon HPT. Boswellic acids in chronic inflammatory diseases. *Planta Med* 2006; **72**: 1100–16.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Multi-ingredient:** **Arg.:** Glucobefol; **Austral.:** Biogan Joint Mobility; *Boswellia* Complex; *Boswellia* Compound; **Ital.:** Actires; Fitogenase; Reumafort; Reviros; **Malaysia:** Rumlanya; **Singapore:** Artrex†; **UK:** NatraFlex; PainEaze.

**Fucoidan**

Fucoidin; Fucoidine; Nemaecystus Mucilage.

Фукоидан

CAS — 9072-19-9.

**Profile**

Fucoidan is a sulfated polysaccharide, based mainly on L-fucose, that is extracted from brown seaweed. It is reported to have anticoagulant, antithrombotic, and antineoplastic activity and has been promoted for a wide-range of disorders and as a food supplement.

**References.**

- Mourão PA. Use of sulfated fucans as anticoagulant and antithrombotic agents: future perspectives. *Curr Pharm Des* 2004; **10**: 967–81.

**Nomenclature.** Fucans are a class of sulfated polysaccharides first isolated from marine algae. Their nomenclature can be somewhat varied and confusing. The original polysaccharide isolated from algae was termed fucoidin and this was later changed to fucoidan. These polysaccharides have also been found in marine invertebrates and improved analytical and separation techniques have allowed different types of sulfated polysaccharides to be identified. It has been suggested that the term sulfated fucan should be defined as a polysaccharide based mainly on sulfated L-fucoses, with less than 10% other monosaccharides.<sup>1</sup> This term has been applied to the sulfated fucans of marine invertebrates, whereas the term fucoidan has been used for fucans extracted from algae. Some define fucoidan as a sulfated polysaccharide of L-fucose and D-galactose extracted from brown seaweed although others have used this term for sulfated polysaccharide complexes having a content of L-fucose of only 60% or less. Other terms that have been coined for these compounds include fucansulfate and fucan sulfate.

- Berteau O, Mulloy B. Sulfated fucans, fresh perspectives: structures, functions, and biological properties of sulfated fucans and an overview of enzymes active toward this class of polysaccharide. *Glycobiology* 2005; **13**: 29R–40R.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Indon.:** Mozuku.

**Fumitory**

Erdrachkraut; Fumaria; Fumariae herba; Fumeterre; Zeměděmová nat'; Ziele dymnicy.

Дымовая Трава; Дымянка Лекарственная

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

**Ph. Eur. 6.2** (Fumitory). The whole or fragmented, dried aerial parts of *Fumaria officinalis* harvested in full bloom. It contains a minimum of 0.40% of total alkaloids, expressed as protopine ( $C_{20}H_{19}NO_5 = 353.4$ ). Protect from light.

**Profile**

Fumitory comprises the dried or fresh flowering plant *Fumaria officinalis* (Papaveraceae) and is used in herbal medicine. It is an ingredient of preparations used mainly for gastrointestinal and biliary-tract disorders.

**Homoeopathy.** Fumitory has been used in homoeopathic medicines under the following names: *Fumaria officinalis*.

**Irritable bowel syndrome.** Neither fumitory nor Javanese turmeric (p.2406) was effective in a study<sup>1</sup> in patients with irritable bowel syndrome.

- Brinkhaus B, *et al.* Herbal medicine with curcuma and fumitory in the treatment of irritable bowel syndrome: a randomized, placebo-controlled, double-blind clinical trial. *Scand J Gastroenterol* 2005; **40**: 936–43.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Austria:** Bilobene; Oddibil; **Braz.:** Oddibil; **Fr.:** Oddibil; **Ger.:** Bilobene; Bomagall mono†; Oddibil†; **Hung.:** Bilobene; **Pol.:** Amphochol.

**Multi-ingredient:** **Austria:** Hepabene; Oddispasmol; **Cz.:** Hepabene†; **Fr.:** Actibil†; Bolcitol; Depuratif Parnel; Depuratum; Schoum; **Hung.:** Hepabene; **Ital.:** Soluzione Schoum; **Pol.:** Boldovera; **Rus.:** Hepabene (Гепабене); **Spain:** Natusor Hepavesical†; Odisor†; Solucion Schoum; **UK:** Echinacea; Skin Cleansing.

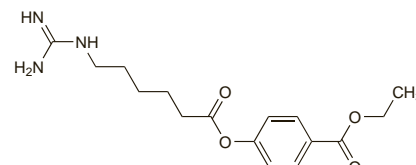
**Gabexate Mesilate** (rINNM)

Gabexate, Mésilate de; Gabexate Mesylate; Gabexati Mesilas; Mesilato de gabexato. Ethyl 4-(6-guanidinohexanoyloxy)benzoate methanesulphonate.

Габексата Мезилат

$C_{16}H_{23}N_3O_4 \cdot CH_4SO_3 = 417.5$ .

CAS — 39492-01-8 (gabexate); 56974-61-9 (gabexate mesilate).



(gabexate)

**Pharmacopoeias.** In *Jpn.***Profile**

Gabexate mesilate is a proteolytic enzyme inhibitor that has been used for the treatment of pancreatitis (p.2361) in an initial dose of 100 to 300 mg daily given by intravenous infusion. The dose may be reduced, or a further 100 to 300 mg given on the same day, according to response. It has also been used for disseminated intravascular coagulation (p.1048) in a dose of 20 to 39 mg/kg given as a continuous intravenous infusion over 24 hours. Hypersensitivity reactions including anaphylaxis have occurred.

**References.**

- Messori A, *et al.* Effectiveness of gabexate mesilate in acute pancreatitis: a metaanalysis. *Dig Dis Sci* 1995; **40**: 734–8.
- Cavallini G, *et al.* Gabexate for the prevention of pancreatic damage related to endoscopic retrograde cholangiopancreatography. *N Engl J Med* 1996; **335**: 919–23.
- Matsukawa Y, *et al.* Anaphylaxis induced by gabexate mesylate. *BMJ* 1998; **317**: 1563.
- Ranucci M, *et al.* Gabexate mesilate and antithrombin III for intraoperative anticoagulation in heparin pretreated patients. *Perfusion* 1999; **14**: 357–62.
- Matsukawa Y, *et al.* Fatal cases of gabexate mesilate-induced anaphylaxis. *Int J Clin Pharmacol Res* 2002; **22**: 81–3.
- Masci E, *et al.* Comparison of two dosing regimens of gabexate in the prophylaxis of post-ERCP pancreatitis. *Am J Gastroenterol* 2003; **98**: 2182–6.
- Andriulli A, *et al.* Prophylaxis of ERCP-related pancreatitis: a randomized, controlled trial of somatostatin and gabexate mesylate. *Clin Gastroenterol Hepatol* 2004; **2**: 713–18.
- Hsu JT, *et al.* Efficacy of gabexate mesilate on disseminated intravascular coagulation as a complication of infection developing after abdominal surgery. *J Formos Med Assoc* 2004; **103**: 678–84.
- Rudin D, *et al.* Somatostatin and gabexate for post-endoscopic retrograde cholangiopancreatography pancreatitis prevention: meta-analysis of randomized placebo-controlled trials. *J Gastroenterol Hepatol* 2007; **22**: 977–83.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Ital.:** Foy; **Jpn:** Foy.

**Gall**

Agallas de roble; Aleppo Galls; Blue Galls; Duběnka; Galla; Galläpfel; Galls; Noix de Galle; Nutgall.

Чернильный Орешек

**Pharmacopoeias.** In *Chin.*

**Profile**

Gall is the excrescences on the twigs of *Quercus infectoria* (Fagaceae), resulting from the stimulus given to the tissues of the young twigs by the development of the larvae of the gall-wasp, *Adleria gallae-tinctoriae* (*Cynips gallae-tinctoriae*) (Cynipidae). It contains about 50 to 70% of gallotannic acid.

Gall is an astringent and has been used in ointments and suppositories for the treatment of haemorrhoids. It is a source of tannic acid (p.2394).

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Spain:** Litiax.

**Galsulfase** (BAN, USAN, rINN)

BM-102; Galsulfasa; Galsulfasum; recombinant human arylsulfatase B; rhASB. *N*-Acetylgalactosamine 4-sulfatase.

Гальсульфас

CAS — 552858-79-4.

ATC — A16AB08.

ATC Vet — QA16AB08.

**Profile**

Galsulfase is recombinant human *N*-acetylgalactosamine 4-sulfatase used as enzyme replacement therapy in the treatment of mucopolysaccharidosis VI (see below). Galsulfase is given by intravenous infusion in a dose of 1 mg/kg once a week. Infusion reactions are common and patients should be pre-treated with antihistamines with or without antipyretics. Galsulfase should be reconstituted to a final volume of 250 mL in sodium chloride 0.9% and given using an infusion pump. The initial infusion rate should be 6 mL/hour for the first hour, which may then be increased to 80 mL/hour if well tolerated. The total infusion time should be at least 4 hours to minimise the risk of infusion reactions, but may be extended to up to 20 hours, or interrupted, if necessary, in the event of infusion reactions. Patients weighing 20 kg and under may be susceptible to fluid overload and a smaller infusion volume of 100 mL should be considered, in which case, the infusion rate should be decreased accordingly so that the total infusion time is not less than 4 hours.

**Adverse effects.** References.

- Kim KH, *et al.* Successful management of difficult infusion-associated reactions in a young patient with mucopolysaccharidosis type VI receiving recombinant human arylsulfatase B (galsulfase [Naglazyme]). Abstract: *Pediatrics* 2008; **121**: 609. Full version: <http://pediatrics.aappublications.org/cgi/content/full/121/3/e714> (accessed 01/05/08)

**Mucopolysaccharidosis VI.** Mucopolysaccharidosis VI (Maroteaux-Lamy syndrome) is a rare progressive disorder characterised by inherited deficiency of the enzyme *N*-acetylgalactosamine 4-sulfatase, which is necessary to catalyse the hydrolysis of the sulfate moiety of the glycosaminoglycan, dermatan sulfate. This results in accumulation of dermatan sulfate in the lysosomes producing widespread irreversible cellular and tissue damage, and organ dysfunction. There is a rapidly advancing form of the disease that presents in the first year of life characterised by short stature, skeletal and joint deformities, dysmorphic facial features, upper airway obstruction requiring tracheostomy, and recurrent ear infections. There is also a more slowly advancing form that progresses over many decades. Both forms result in significant morbidity and functional problems with a reduced lifespan.<sup>1</sup>

Treatment is supportive and symptomatic involving many body systems; physical and occupational therapy is also necessary.<sup>1</sup> Haematopoietic stem-cell transplantation to supply the deficient enzyme is of benefit to some patients, although it is associated with significant morbidity and mortality.<sup>1</sup> Enzyme replacement therapy with galsulfase has been reported to confer benefit with an acceptable safety profile.<sup>1,2</sup>

- Giugliani R, *et al.* Management guidelines for mucopolysaccharidosis VI. *Pediatrics* 2007; **120**: 405–18.
- Harmatz P, *et al.* Enzyme replacement therapy for mucopolysaccharidosis VI: a phase 3, randomized, double-blind, placebo-controlled, multinational study of recombinant human *N*-acetylgalactosamine 4-sulfatase (recombinant human arylsulfatase B or rhASB) and follow-on, open-label extension study. *J Pediatr* 2006; **148**: 533–9.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Cz.:** Naglazyme; **Fr.:** Naglazyme; **Port.:** Naglazyme; **USA:** Naglazyme.

**Gamma-aminobutyric Acid**

Ácido gamma-aminobutírico; Acidum Aminobutyricum Gamma;  $\gamma$ -Aminobutírico; ácido; Aminobutyric Acid; GABA; Gamma-aminosmörösyra; Gamma-aminovoihappy; Piperidic Acid. 4-Aminobutyric acid.

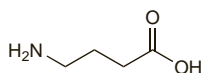
Гамма-аминобутировая Кислота

C<sub>4</sub>H<sub>9</sub>NO<sub>2</sub> = 103.1.

CAS — 56-12-2.

ATC — N03AG03.

ATC Vet — QN03AG03.

**Profile**

Gamma-aminobutyric acid is a principal inhibitory neurotransmitter in the CNS. It has been claimed to be of value in cerebral disorders and to have an antihypertensive effect.

**Preparations**

**Proprietary Preparations** (details are given in Part 3)

**Braz.:** Gammarr; **Hong Kong:** Gammalon; **Port.:** Mielomadej; **Thai.:** Bainto; Gammalon.

**Multi-ingredient:** **Arg.:** Butineuron; Cadencial Plus; **Braz.:** Compevit; Gabaj; Gabax; Id Sedinj; **Chile:** Actebra; Gamalate B6; **Spain:** Cefabol; Gamalate B6.

**Gamolenic Acid** (BAN, rINN)

Acide Gamolénique; Ácido gamolénico; Acidum Gamolenicum; GLA;  $\gamma$ -Linolenic Acid. (Z,Z,Z)-Octadeca-6,9,12-trienoic acid.

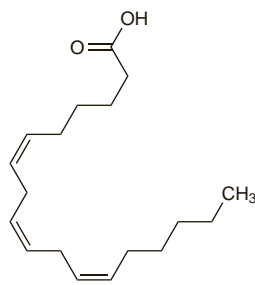
Гамоленовая Кислота

C<sub>18</sub>H<sub>30</sub>O<sub>2</sub> = 278.4.

CAS — 506-26-3.

ATC — D11AX02.

ATC Vet — QD11AX02.

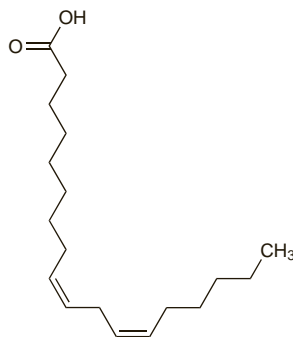
**Linoleic Acid**

Kwas linolowy; Linoleico, ácido; Linolic Acid; Linolsäure. (Z,Z)-Octadeca-9,12-dienoic acid.

Линолевая Кислота

C<sub>18</sub>H<sub>32</sub>O<sub>2</sub> = 280.4.

CAS — 60-33-3.

**Adverse Effects and Precautions**

Gamolenic and linoleic acids from evening primrose oil, and presumably other sources, can produce minor gastrointestinal disturbances and headache. They can precipitate symptoms of undiagnosed temporal lobe epilepsy, and should be used with caution in patients with a history of epilepsy or those taking epileptogenic drugs, in particular phenothiazines. Hypersensitivity reactions may also occur.

**Uses and Administration**

Gamolenic and linoleic acid are essential fatty acids of the omega-6 series that act as prostaglandin precursors. Endogenous gamolenic acid is derived from linoleic acid, which is present in many vegetable oils and is an essential constituent of the diet. The most widely-used source of these acids is evening primrose oil (see p.2302). Gamolenic and linoleic acids have been used in skin disorders and mastalgia, and have been investigated in other disorders including multiple sclerosis, rheumatoid arthritis, and the premenstrual syndrome.

Preparations containing essential fatty acids (formerly known collectively as vitamin F), including arachidonic acid, linoleic acid, linolenic acid ( $\alpha$ -linolenic acid, p.1362), oleic acid, and their derivatives, have been used similarly. Conjugated linoleic acid (CLA), a mixture of isomers in which *cis*-9,*trans*-11-octadecadienoic acid and *trans*-10,*cis*-12-octadecadienoic acid predominate, has also been used.

Products containing gamolenic-acid rich plant oils are promoted in many countries as dietary supplements, often in combination with fish oils as other sources of omega-3 fatty acids (see p.1362).

A derivative of gamolenic acid, lithium gamolenate, has been investigated in pancreatic cancer.

**Eczema.** Atopic eczema (p.1579) may be due to a defect in essential fatty acid metabolism<sup>1,2</sup> and some beneficial symptomatic effects have been reported with evening primrose oil.<sup>1,3</sup> Meta-analysis of 9 studies involving 311 patients<sup>4</sup> has reported improvement in disease symptoms, especially itching, but a subsequent study in 123 patients found no therapeutic effect of evening primrose oil, alone or with fish oil.<sup>5</sup> Although the design and interpretation of this study has been criticised by the manufacturers of evening primrose oil,<sup>6</sup> the authors consider such criticism invalid,<sup>7</sup> and point out that an earlier large study yielded similar results.<sup>8</sup> No difference was found between placebo and evening primrose oil in a further study<sup>9</sup> in children with eczema, and there was also no effect on asthma symptoms in those patients suffering from both disorders. Studies<sup>10,11</sup> of borage oil (another source of gamolenic acid) also found no overall efficacy in adults or children with atopic eczema, although one study noted a suggestion of benefit in a subgroup of patients.<sup>10</sup> In a study<sup>12</sup> of a group of formula-fed infants with a high maternal familial risk of developing atopic eczema, borage oil supplementation did not prevent the expression of atopy, although it showed a tendency to alleviate the severity of the condition later in infancy. Benefit has been reported in infants with seborrhoeic dermatitis from local application of borage oil.<sup>13</sup>

- Wright S. Essential fatty acids and the skin. *Br J Dermatol* 1991; **125**: 503–15.
- Horrobin DF. Essential fatty acid metabolism and its modification in atopic eczema. *Am J Clin Nutr* 2000; **71** (suppl): 367S–372S.
- Rustin MHA. Dermatology. *Postgrad Med J* 1990; **66**: 894–905.
- Morse PF, *et al.* Meta-analysis of placebo-controlled studies of the efficacy of Epogam in the treatment of atopic eczema: relationship between plasma essential fatty acid changes and clinical response. *Br J Dermatol* 1989; **121**: 75–90.
- Berth-Jones J, Graham-Brown RAC. Placebo-controlled trial of essential fatty acid supplementation in atopic dermatitis. *Lancet* 1993; **341**: 1557–60. Correction. *ibid.*; **342**: 564.
- Shield MJ, *et al.* Essential fatty acid supplementation in atopic dermatitis. *Lancet* 1993; **342**: 377.
- Berth-Jones J, *et al.* Essential fatty acid supplementation in atopic dermatitis. *Lancet* 1993; **342**: 377–8. Correction. *ibid.*; **342**: 752.
- Bamford JTM, *et al.* Atopic eczema unresponsive to evening primrose oil (linoleic and gamma-linolenic acids). *J Am Acad Dermatol* 1985; **13**: 959–65.
- Hederos C-A, Berg A. Epogam evening primrose oil treatment in atopic dermatitis and asthma. *Arch Dis Child* 1996; **75**: 494–7.
- Henz BM, *et al.* Double-blind, multicentre analysis of the efficacy of borage oil in patients with atopic eczema. *Br J Dermatol* 1999; **140**: 685–8.
- Takwale A, *et al.* Efficacy and tolerability of borage oil in adults and children with atopic eczema: randomised, double blind, placebo controlled, parallel group trial. *BMJ* 2003; **327**: 1385–7.
- van Gool CJ, *et al.*  $\gamma$ -Linolenic acid supplementation for prophylaxis of atopic dermatitis—a randomized controlled trial in infants at high familial risk. *Am J Clin Nutr* 2003; **77**: 943–51.
- Tollessen A, Frithz A. Borage oil, an effective new treatment for infantile seborrhoeic dermatitis. *Br J Dermatol* 1993; **129**: 95.

**Mastalgia.** Gamolenic acid (usually given in the form of evening primrose oil) has fewer adverse effects than drugs such as danazol or bromocriptine and has been preferred for mastalgia (p.2092), especially in patients with less severe symptoms or those who require prolonged or repeated treatment. However, there is no clear evidence of efficacy.

**Multiple sclerosis.** There is some evidence that modifying the intake of dietary fats and supplementing the diet with omega-6 polyunsaturated fatty acids, such as linoleic acid, could influence the clinical course of multiple sclerosis (p.892) and many patients practise dietary modification, including taking evening primrose oil. One study<sup>1</sup> has shown a reduction in severity and duration of relapse in patients taking linoleic acid supplements (as sunflower oil), and another<sup>2</sup> has reported benefit in patients who limited their intake of dietary saturated fatty acids and supplemented their diet with polyunsaturated fatty acids. A systematic review<sup>3</sup> of the relationship between dietary interventions (including linoleic acid supplements) and MS concluded that there was insufficient evidence to determine their benefits or risks.

- Millar JHD, *et al.* Double-blind trial of linoleate supplementation of the diet in multiple sclerosis. *BMJ* 1973; **1**: 765–8.
- Swank RL, Dugan BB. Effect of low saturated fat diet in early and late cases of multiple sclerosis. *Lancet* 1990; **336**: 37–9.
- Farinotti M, *et al.* Dietary interventions for multiple sclerosis. Available in The Cochrane Database of Systematic Reviews; Issue 1. Chichester: John Wiley; 2007 (accessed 22/04/08).

**Premenstrual syndrome.** Progressive improvement in premenstrual syndrome (p.2099) was reported over 5 cycles in an open pilot study in 19 patients receiving evening primrose oil.<sup>1</sup> However, subsequent results have not shown any benefit.<sup>2,4</sup> Evening primrose oil has been considered for cyclical mastalgia (see above).

- Larsson B, *et al.* Evening primrose oil in the treatment of premenstrual syndrome: a pilot study. *Curr Ther Res* 1989; **46**: 58–63.
- Khoo SK, *et al.* Evening primrose oil and treatment of premenstrual syndrome. *Med J Aust* 1990; **153**: 189–92.
- Collins A, *et al.* Essential fatty acids in the treatment of premenstrual syndrome. *Obstet Gynecol* 1993; **81**: 93–8.
- Budeiri DJ, *et al.* Is evening primrose oil of value in the treatment of premenstrual syndrome? *Control Clin Trials* 1996; **17**: 60–8.