increased every 15 minutes during the first hour, as tolerated, to a maximum of 43 units/kg per hour such that the infusion is completed in about 3 to 4 hours (but see also under Adverse Effects, Treatment, and Precautions, above). In some countries, the dose is expressed as mg/kg: 100 units is equivalent to about 580 micrograms of laronidase.

Mucopolysaccharidosis I. Mucopolysaccharidosis I is a progressive disorder characterised by deficiency of the enzyme α-L-iduronidase, which is necessary to catalyse the hydrolysis of terminal α-L-iduronic residues of the glycosaminoglycans, dermatan sulfate and heparan sulfate. This results in their accumulation in tissues, with many clinical manifestations including hepatomegaly, skeletal abnormalities, pulmonary disease, eye disease, and progressive deterioration of the CNS. Mucopolysaccharidosis I has traditionally been classified into three main forms based on clinical symptoms and severity: Hurler syndrome, Hurler-Scheie syndrome, and Scheie syndrome. Hurler syndrome is the most severe form with a life expectancy of less than 10 years. However, there is a degree of overlap between the syndromes and they are indistinguishable by routine enzyme or urine tests.

Treatment was previously limited to symptomatic management but other options to halt disease progression are now available. Haematopoietic stem-cell transplantation using bone marrow or umbilical cord blood is of benefit in systemic disease and can prevent (but not usually reverse) CNS deterioration. However, substantial adverse effects limit its use to patients with severe disease. Enzyme replacement therapy with laronidase has been reported to confer benefit on the systemic manifestations of the disease, but since it does not cross the blood-brain barrier in appreciable amounts, beneficial effect on CNS symptoms is again predicted to be unlikely. However, the improvements conferred by enzyme replacement therapy might make haematopoietic stem-cell transplantation easier to tolerate.

References.

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Preparations

Proprietary Preparations (details are given in Part 3)

Belg.: Aldurazyme; ***Canad.:*** Aldurazyme; ***Cz.:*** Aldurazyme; ***Denm.:*** Aldurazyme; ***Fin.:*** Aldurazyme; ***Fr.:*** Aldurazyme; ***Ger.:*** Aldurazyme; ***Israel:*** Aldurazyme; ***Ital.:*** Aldurazyme; ***Neth.:*** Aldurazyme; ***Norw.:*** Aldurazyme; ***NZ:*** Aldurazyme; ***Pol.:*** Aldurazyme; ***Spain:*** Aldurazyme; ***Swed.:*** Aldurazyme; ***UK:*** Aldurazyme; ***USA:*** Aldurazyme.

Lavender

English Lavender; Kwiat lawendy (lavender flower); Lavande, fleur de (lavender flower); Lavande Vrai; Lavandulae flos (lavender flower); Lavendelblomma (lavender flower); Lavendelblüten; Laventelinkukka (lavender flower); Levandų žiedai (lavender flower); Levandulový květ (lavender flower); Levendulavirág (lavender flower).

Pharmacopoeias. *Eur.* (see p.vii) includes lavender flower.
Ph. Eur. 6.2 (Lavender Flower; Lavandulae flos). It consists of the dried flower of *Lavandula angustifolia* (*L. officinalis*). It contains not less than 1.3% v/w of essential oil, calculated with reference to the anhydrous drug. Protect from light.

Profile

Lavender flower is used as a sedative. It has also been used as a cholagogue. It is an ingredient of herbal remedies used for a variety of disorders.

Lavender flowers are the source of lavender oil (below).

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Arg.:*** Lavandula Oligoplex; ***Austral.:*** Cimicifuga Compound; ***Austria:*** Euka; Mentopin; ***Braz.:*** Balsamo Branco; Traumac; ***Cz.:*** Melaton†; Schlaf-Nerventee N†; Valofyt Neo; ***Fr.:*** Mediflor Tisane Digestive No 3; ***Ger.:*** Presselin Dyspeptikum†; ***NZ:*** Botanica Hayfever; ***Pol.:*** Lumewal; Nervinolum; Nervosol; Reumobonisol; ***Port.:*** Cholagutt†; Erpecalm; ***S.Afr.:*** Krampdruppels; ***Spain:*** Linimento Naion; ***Switz.:*** Tisane relaxante N†; ***UK:*** Vital Eyes.

Lavender Oil

English Lavender Oil (from *L. intermedia*); Esencia de Alhucema; Esencia de Espliego; Essência de Alfazema; Foreign Lavender Oil (from *L. officinalis*); Huile Essentielle de Lavande; Lavanda, aceite esencial de; Lavande, huile essentielle de; Lavandulae aetheroleum; Lavandulae Etheroleum; Lavanta Yağı; Lavendelöl; Lavendelolja; Lavender Flower Oil; Laventeliöljy; Levandų eterinis aliejus; Levandulová silice; Olejek lawendowy; Oleum Lavandulae.

Pharmacopoeias. In *Eur.* (see p.vii).
Ph. Eur. 6.2 (Lavender Oil). An essential oil obtained by steam distillation from the flowering tops of *Lavandula angustifolia* (*L. officinalis*). A colourless or pale yellow clear liquid with a characteristic odour. Relative density 0.878 to 0.892. Store in well-filled airtight containers at a temperature not exceeding 25°. Protect from light.

Profile

Lavender oil has been used as a carminative and as a flavour. It is sometimes applied externally as an insect repellent. Its chief use is in perfumery and it is occasionally used in ointments and other pharmaceutical preparations to cover disagreeable odours. It has been suggested that lavender oil may have sedative properties after inhalation. It is also used in aromatherapy.

Lavender oil has been reported to produce nausea, vomiting, headache, and chills when inhaled or absorbed through the skin. It may cause contact allergy and phototoxicity.

Adverse effects. There have been reports of contact dermatitis associated with lavender oil in a shampoo,[1] and facial dermatitis after application of the oil to pillows for its sedative properties.[2]

1. Brandão FM. Occupational allergy to lavender oil. *Contact Dermatitis* 1986; **15:** 249–50.
2. Coulson IH, Khan ASA. Facial 'pillow' dermatitis due to lavender oil allergy. *Contact Dermatitis* 1999; **41:** 111.

Insomnia. Ambient exposure to lavender oil produced similar sleep patterns to conventional sedatives in 4 elderly patients.[1]

1. Hardy M, *et al.* Replacement of drug treatment for insomnia by ambient odour. *Lancet* 1995; **346:** 701.

Preparations

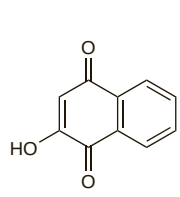
Proprietary Preparations (details are given in Part 3)

Pol.: Lawenol.

Multi-ingredient: ***Austral.:*** Apex Repel Natural; Neutralice; ***Austria:*** Berggeist; Rowalind; ***Belg.:*** Mouskito Travel Milk; ***Braz.:*** Aliviol; Analgen†; Benegel; Gelflex; Gelol†; Gelonevral†; Inhalante Yatropan; Mentalol†; Mialgex†; Nevrol; Salimetin†; ***Cz.:*** Amol; Ondrejova Mast; Tiger Ol†; ***Fr.:*** Aromasol; Balsofumine; Balsofumine Mentholee; Ephydrol; Gouttes aux Essences; Maghora; Moustidose; Moustidose Bebe-Nourrisson; Paps; Pectoderme†; Perubore; Poudre du Marcheur; Resistim; ***Ger.:*** Amol Heilkrautergeist N; Dolo-cyl; Leber-Galle-Tropfen 83†; Solum Ol; ***Hong Kong:*** Calmiderm; ***Hung.:*** Opodeldok†; ***Israel:*** Headache Pads; ***Ital.:*** Citrosystem; Controller; Mistick Verde; Venalta; Vicks Baby Balsam†; ***NZ:*** Apex Repel Natural; Electric Blue Headlice; Vicks Baby Balsam; ***Pol.:*** Amol; Aromatol; Carmolis; ***Port.:*** Solubeol†; Vaporil; ***Rus.:*** Carmolis (Кармолис)†; Carmolis Fluid (Кармолис Жидкость)†; Espol (Эспол); ***S.Afr.:*** Arnica Massage Oil; Entressdruppels HM; Rooilavental; ***Spain:*** Dolokey; Termosan; ***Switz.:*** Baume du Chalet; Carmol; Dolo-Arthrosenex sine Heparino†; Hygiodermil; Liberol Bain†; Massorax†; Muco-Sana†; Nasobol†; Oculosan; Perskindol Classic; Perubare†; Pommade Nasale Radix†; Pulmex; Saltrates†; Spagyrom; Ziegella; ***Turk.:*** Algo-Wax; ***UK:*** Arnica Massage Balm; Eucanol; Larch Resin comp.; Massage Balm with Calendula; Migrastick; ***USA:*** Nasal Jelly; ***Venez.:*** Friccion Aromatica.

Lawsone

Lawsonia. 2-Hydroxy-1,4-naphthoquinone.
$C_{10}H_6O_3$ = 174.2.
CAS — 83-72-7.



Profile

Lawsone is a dye present in henna (p.2318), the leaves of *Lawsonia* spp., and may also be prepared synthetically. It has been used with dihydroxyacetone in sunscreen preparations. There appears to be no evidence that it has any sunscreening properties when used alone.

Adverse effects. Observation that lawsone causes oxidative damage to red blood cells *in vitro* supported a suggestion that percutaneous absorption of henna could contribute to unexplained neonatal hyperbilirubinaemia in countries where the ceremonial use of henna is widespread.[1]

1. Zinkham WH, Oski FA. Henna: a potential cause of oxidative hemolysis and neonatal hyperbilirubinemia. *Pediatrics* 1996; **97:** 707–9.

Lead

Blei; Plomb; Plomo; Plumbum.
Pb = 207.2.
CAS — 7439-92-1.

Description. Lead is a grey, malleable and ductile metal.

Adverse Effects

Lead poisoning (plumbism) may be due to inorganic or organic lead and may be acute or, more often, chronic. It has followed exposure to a wide range of compounds and objects from which lead may be absorbed following ingestion or inhalation. Some of those that have been incriminated include paint, pottery glazes, crystal glassware, domestic water supplies, petrol, poteen, cosmetics (particularly home-made or traditional forms such as kohl or surma), herbal or folk remedies, including traditional Chinese medicines, newsprint, and retained bullets. Children are often the victims of accidental poisoning and may be vulnerable to chronic exposure to lead from environmental pollution.

Acute effects of lead poisoning include metallic taste, abdominal pain, diarrhoea, vomiting, hypotension, muscle weakness and cramps, fatigue, abnormal liver function tests, and acute interstitial nephritis. Encephalopathy may occur and is more common in children. Symptoms of chronic poisoning with inorganic lead include anorexia, abdominal pain, constipation, anaemia, headache, fatigue, irritability, peripheral neuropathy, and encephalopathy with convulsions and coma. There may be kidney damage and impairment of mental function. Children with elevated lead concentrations may be asymptomatic apart from intellectual deficits and behavioural disorders.

Organic lead poisoning produces mainly CNS symptoms; there can be gastrointestinal and cardiovascular effects, and renal and hepatic damage.

◊ General references to lead exposure, adverse effects, screening, and management,[1-15] and case reports of specific sources of lead exposure.[16-21]

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6. Kordas K, *et al.* Iron and zinc supplementation does not improve parent or teacher ratings of behavior in first grade Mexican children exposed to lead. *J Pediatr* 2005; **147:** 632–9.
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9. Téllez-Rojo MM, *et al.* Longitudinal associations between blood lead concentrations lower than 10 μg/dL and neurobehavioral development in environmentally exposed children in Mexico City. *Pediatrics* 2006; **118:** e323–e330. Available at: http://pediatrics.aappublications.org/cgi/content/full/118/2/e323 (accessed 08/07/08)
10. Yuan W, *et al.* The impact of early childhood lead exposure on brain organization: a functional magnetic resonance imaging study of language function. *Pediatrics* 2006; **118:** 971–7.
11. Menke A, *et al.* Blood lead below 0.48 μmol/L (10 μg/dL) and mortality among US adults. *Circulation* 2006; **114:** 1388–94.
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