

**Uses and Administration**

Stramonium has the actions of atropine (p.1219). It has been given with other drugs in oral and rectal dosage forms for respiratory-tract disorders. It has also been smoked in cigarettes or burnt in powders and the fumes inhaled but the irritation produced by the fumes may aggravate bronchitis.

**Homoeopathy.** Stramonium has been used in homoeopathic medicines under the following names: *Datura stramonium*; *Stram*.

**Preparations**

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

**Multi-ingredient:** **Austral:** Potassium Iodide and Stramonium Compound†; **Braz:** Asmatron†; Expectol†; Teutos†.

**Streptodornase** (BAN, rINN)

Streptodornasa; Streptococcal Deoxyribonuclease; Streptodor-naasi; Streptodornasa; Streptodornasum.

Стрептодорназа

CAS — 37340-82-2.

**Profile**

Streptodornase is an enzyme obtained from cultures of various strains of *Streptococcus haemolyticus*. It catalyses the depolymerisation of polymerised deoxyribonucleoproteins. It liquefies the viscous nucleoprotein of dead cells; it has no effect on living cells. It is used with streptokinase in the topical treatment of lesions, wounds, and other conditions that require the removal of clots or purulent matter; the combination may also be used to dissolve clots in the bladder or in urinary catheters.

It has also been given orally with streptokinase and sometimes with antibacterials, for its supposed benefit in reducing oedema and inflammation associated with trauma and infection.

**Preparations**

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

**Multi-ingredient:** **Arg:** Varidasa†; **Austral:** Varidase†; **Austria:** Varidase; **Denm:** Varidase; **Fin:** Varidase; **Ger:** Varidase; **Irl:** Varidase†; **Ital:** Varidase†; **Mex:** Varidasa; **Norw:** Varidase; **Pol:** Distreptaza; **Port:** Varidasa†; **Spain:** Ernodasa; Varidasa; **Swed:** Varidase; **UK:** Varidase†.

**Strontium Chloride**

Estroncio, cloruro de; Stronsiyum Klorür; Strontii Chloridum; Strontiumklorid; Strontiumkloridi.

SrCl<sub>2</sub>·6H<sub>2</sub>O = 266.6.

CAS — 10476-85-4 (anhydrous strontium chloride).

**Profile**

Strontium chloride is used as a 10% toothpaste for the relief of dental hypersensitivity. Strontium acetate has been used similarly.

**Preparations**

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

**Arg:** Sensodyne Original; **Austria:** Sensodyne med; **Braz:** Sensodyne Formula Original; **Canad:** Sensodyne; **Chile:** Dentoxil; **Switz:** Sensodent†; **Turk:** Sensodyne Mint; **UK:** Sensodyne Original; **USA:** Sensodyne-SC; **Venez:** Sencia; Tekdent†.

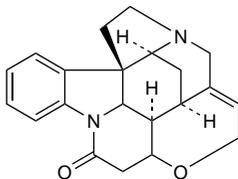
**Multi-ingredient:** **Arg:** Esme Topico; **Canad:** Reversa UV; **Ital:** Ptitene; **Singapore:** 2Sensitve†.

**Strychnine** ⊗

Estricnina; Strychnina. Strychnidin-10-one.

C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub> = 334.4.

CAS — 57-24-9.



**Description.** Strychnine is an alkaloid obtained from the seeds of *nux vomica* (p.2355) and other species of *Strychnos*.

**Strychnine Hydrochloride** ⊗

Estricnina, hidrocloreuro de; Strych. Hydrochlor; Strychninae Hydrochloridum.

C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub>·HCl·2H<sub>2</sub>O = 406.9.

CAS — 1421-86-9 (anhydrous strychnine hydrochloride); 6101-04-8 (strychnine hydrochloride dihydrate).

The symbol † denotes a preparation no longer actively marketed

**Strychnine Nitrate** ⊗

Azotato de Estricnina; Estricnina, nitrato de; Nitrato de Estricnina; Strychninae Nitras; Strychnini Nitras; Strychninum Nitricum; Strykniininitraatti; Strykniininitrat.

C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub>·HNO<sub>3</sub> = 397.4.

CAS — 66-32-0.

**Pharmacopeias.** In *Chin*.

**Strychnine Sulfate** ⊗

Estricnina, sulfato de; Strychninae Sulphas; Strychnine Sulphate; Strychninum Sulfonicum; Sulfato de Estricnina.

(C<sub>21</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub>)<sub>2</sub>·H<sub>2</sub>SO<sub>4</sub>·5H<sub>2</sub>O = 857.0.

CAS — 60-41-3 (anhydrous strychnine sulfate); 60491-10-3 (strychnine sulfate pentahydrate).

**Pharmacopeias.** In *Fr* and *Viet*.

**Adverse Effects**

The symptoms of strychnine poisoning are mainly those arising from stimulation of the CNS. Early signs occurring within 15 to 30 minutes of ingestion include tremors, slight twitching, and stiffness of the face and limbs. Painful convulsions develop and may be triggered by minor sensory stimuli; since consciousness is not impaired patients may be extremely distressed. All forms of sensation are heightened. The body becomes arched backwards in hyperextension with the head retracted, arms and legs extended, fists clenched, and the feet turned inward. The jaw is rigidly clamped and contraction of the facial muscles produces a characteristic grinning expression known as 'risus sardonicus'. The convulsions may recur repeatedly and are interspersed with periods of relaxation. If not treated adequately, few patients survive more than 5 episodes of convulsions, death usually occurring due to respiratory and cardiac arrest. Fatalities in adults have occurred with doses as little as 16 mg.

Secondary effects arising from the severe spasms include lactic acidosis, rhabdomyolysis, renal failure, hyperthermia, hyperkalaemia, and dehydration.

**Poisoning, References.**

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- Blain PG, et al. Strychnine poisoning: abnormal eye movements. *J Toxicol Clin Toxicol* 1982; **19**: 215-17.
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- Scheffold N, et al. Strychninvergiftung. *Dtsch Med Wochenschr* 2004; **129**: 2236-8.
- Shadnia S, et al. A case of acute strychnine poisoning. *Vet Hum Toxicol* 2004; **46**: 76-9.

**Treatment of Adverse Effects**

The main aim of therapy in strychnine poisoning is the prompt prevention or control of convulsions and asphyxia. Activated charcoal should be given if the patient presents within 1 hour of ingestion. Convulsions should be controlled or prevented by diazepam or lorazepam. Intubation and assisted respiration may be required. Should benzodiazepines fail then phenytoin or phenobarbital may be tried. All unnecessary external stimuli should be avoided and if possible the patient should be kept at rest in a quiet darkened room. Patients should be monitored for any secondary effects such as metabolic acidosis so that appropriate symptomatic treatment can be given.

**Uses and Administration**

Strychnine competes with glycine, which is an inhibitory neurotransmitter; it thus exerts a central stimulant effect by blocking an inhibitory activity.

Strychnine was formerly used as a bitter and analeptic but is now mainly used under strict control as a rodenticide. It has also been used as a mole poison, although this use is banned in some countries including the UK. Strychnine has been used in multi-ingredient preparations for the treatment of ophthalmic and urinary-tract disorders. It has also been tried in the treatment of nonketotic hyperglycaemia.

**Nonketotic hyperglycaemia.** Nonketotic hyperglycaemia (also known as glycine encephalopathy) is an inborn defect in the enzyme system responsible for the metabolism of glycine. It is characterised by raised concentrations of glycine in plasma, CSF, and urine. Symptoms of glycine accumulation include res-

piratory distress, muscular hypotonia, seizures, vomiting, and extreme lethargy. Mental retardation and early infant death are common.

Sodium benzoate can reduce plasma-glycine concentrations to near normal<sup>1</sup> but is relatively ineffective in reducing CSF levels or in preventing mental retardation.<sup>2</sup> Strychnine, a glycine antagonist, has been of some benefit in counteracting its CNS effects.<sup>3-5</sup> However, even treatment with both drugs may be ineffective in severe cases<sup>6</sup> and may ultimately have little effect on the course of the disease.<sup>7</sup> Glycine is reported to stimulate *N*-methyl-D-aspartate (NMDA) receptors in the CNS and the combination of strychnine and ketamine (an NMDA receptor antagonist) was of some benefit in a newborn infant with severe non-ketotic hyperglycaemia.<sup>8</sup> Addition of low-dose dextromethorphan (an NMDA receptor antagonist) to treatment with sodium benzoate, arginine, carnitine, diazepam, and phenobarbital in an infant with nonketotic hyperglycaemia<sup>9</sup> was associated with resolution of nystagmus and improvement in eye contact and interactive behaviour, without altering serum- or CSF-glycine concentrations. Dextromethorphan with sodium benzoate alone may also be helpful, although the combination is not uniformly effective.<sup>10</sup> Treatment with sodium benzoate and dextromethorphan was beneficial in a 6-month-old child with mild atypical nonketotic hyperglycaemia,<sup>11</sup> although it was later shown that it was sodium benzoate that had the greatest effect on EEG and behavioural changes. A partial response to low-protein diet and sodium benzoate occurred in a patient with late-onset nonketotic hyperglycaemia; there was a more dramatic response when imipramine was added to therapy.<sup>12</sup>

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**Preparations**

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

**Multi-ingredient:** **Chile:** Vigofortal; **Hung:** Artin†; **Israel:** Tesopalmed Forte cum Yohimbine; **Ital:** Neurofal†; **Pol:** Cardiamid-Coffein; **Port:** Hipersex†; **Thai:** Hemo-Cyto-Serum.

**Suanzaorentang**

Ziziphus Soup.

**Profile**

Suanzaorentang is a traditional Chinese remedy for anxiety and insomnia. It contains five herbs: suanzaoren (*Zizyphus spinosus*, Rhamnaceae), fuling (*Poria cocos*, Polyporaceae), gancao (*Glycyrrhiza uralensis*, Leguminosae), zhimu (*Anemarrhena asphodeloides*, Liliaceae), and chuanxiong (*Ligusticum sinense*, Umbelliferae).

**Subtilisin A**

Subtilisin Carlsberg; Subtilopeptidase A.

Субтиллизин А

CAS — 9014-01-1 (subtilisin).

**Profile**

Subtilisins are a class of serine proteases isolated initially from *Bacillus subtilis* but which are also excreted by other *Bacillus* species. They are widely used in the manufacture of enzymatic detergents. Hypersensitivity reactions have been reported.

Subtilisin A, which is obtained from *Bacillus licheniformis*, is used as an enzymatic cleanser for contact lenses.

**References.**

- Lemiere C, et al. Isolated late asthmatic reaction after exposure to a high-molecular-weight occupational agent, subtilisin. *Chest* 1996; **110**: 823-4.

The symbol ⊗ denotes a substance whose use may be restricted in certain sports (see p.vii)