2. Chrubasik S, *et al.* Treatment of low back pain with a herbal or synthetic anti-rheumatic: a randomized controlled study. Willow bark extract for low back pain. *Rheumatology (Oxford)* 2001; **40:** 1388–93.
3. Gagnier JJ, *et al.* Herbal medicine for low back pain. Available in The Cochrane Database of Systematic Reviews; Issue 2. Chichester: John Wiley; 2006 (accessed 05/10/06).
4. Biegert C, *et al.* Efficacy and safety of willow bark extract in the treatment of osteoarthritis and rheumatoid arthritis: results of 2 randomized double-blind controlled trials. *J Rheumatol* 2004; **31:** 2121–30.

Preparations

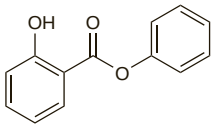
Proprietary Preparations (details are given in Part 3)
Braz.: Zortrix; ***Ger.:*** Assalix; Assplant; Lintia†; Rheumakaps; Rheumatab Salicis†; ***Pol.:*** Salicortex; ***Switz.:*** Assalix.

Multi-ingredient: ***Austral.:*** Arthritic Pain Herbal Formula 1; Bioglan Arthri Plus; Extralife Migrai-Care; Extralife PMS-Care; Guaiacum Complex†; Lifesystem Herbal Formula 1 Arthritic Aid†; Prost-1†; ***Austria:*** Digestodoron; ***Braz.:*** Calman; Calmiplan; Floriny; Pasalix; Pasic; Passi Catha†; Passiflorine; ***Cz.:*** Antirevmaticky Caj; Erkaltungstee†; Valofyt Neo; ***Fr.:*** Arkophytum†; Mediflor Tisane Circulation du Sang No 12; Phytheol; ***Ger.:*** Digestodoron; Dr Wiemanns Rheumatonikum; ***Ital.:*** Biothymus DS; Bodyguard; Donalg; Influ-Zinc; Nepiros; Nevril; Passiflorine; Reumafort; ***Malaysia:*** Celery Plus†; ***Mex.:*** Ifupasil; ***Pol.:*** Enterosol; Pyrosal; Reumacor; Reumosol; Termasil; ***Port.:*** Neurocardol†; ***S.Afr.:*** Digestodoron; ***Spain:*** Dolosul†; Jaquesor†; Mesatil†; Natusor Harpagosinol†; Natusor Jaquesan†; ***Switz.:*** Dragees antirhumatismales; Strath Gouttes Rhumatisme; Tisane antirhumatismale; ***UK:*** Bio-Strath Willow Formula; Gerard House Reumalex; Herbal Pain Relief; St Johnswort Compound; ***Venez.:*** Passiflorum.

Salol

Benzofenolsalicylaat; Benzophénol Salicylate; Fenylsalicylat; Fenylu salicylan; Fenyylisalisylaatti; Phenyli Salicylas; Phenylis Salicylas; Salicilato de fenilo. Phenyl salicylate.

$C_{13}H_{10}O_3$ = 214.2.
CAS — 118-55-8.
ATC — G04BX12.
ATC Vet — QG04BX12.



Pharmacopoeias. In *Pol.*

Profile

Salol is a salicylic acid derivative (see Aspirin, p.20). It was formerly used as an intestinal antiseptic, but effective doses were toxic owing to the liberation of phenol. It is used in oral preparations containing methenamine for the treatment of lower urinary-tract infections.

Salol has been used topically as a sunscreen.

Preparations

Proprietary Preparations (details are given in Part 3)
Austral.: Aussie Tan Sunstick.

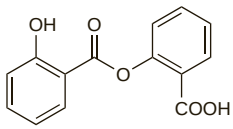
Multi-ingredient: ***Arg.:*** Dermithan; ***Austria:*** Carl Baders Divinal; ***Belg.:*** Borostyrol; ***Braz.:*** Talco Alivio†; ***Canad.:*** Franzbranns†; ***Chile:*** Galutec†; Polisep†; ***Cz.:*** Parodontal F5†; ***Fr.:*** Borostyrol; Dermophil Indien†; Nisacalm; ***Pol.:*** Salotannal; Urosal; ***Switz.:*** Borostyrol N†; Dermophil Indien; GU Eau†; Penta; ***Turk.:*** Sandolin; ***USA:*** Atrosept; Dolsed†; MHP-A; MSP-Blu; Prosed/DS; Trac Tabs 2X†; UAA; Urelle; Uretron; Uridon Modified†; Urimar-T; Urimax; Urised; Uriseptic; UriSym†; Uritact; Uro Blue; Urogesic Blue; Utira.

Salsalate *(BAN, USAN, rINN)*

NSC-49171; Salicyl Salicylate; Salicylosalicylic Acid; Salicylsalicylic Acid; Salsalato; Salsalatum; Salysal; Sasapyrine. *O*-(2-Hydroxybenzoyl)salicylic acid.

Сальсалат

$C_{14}H_{10}O_5$ = 258.2.
CAS — 552-94-3.
ATC — N02BA06.
ATC Vet — QN02BA06.



Pharmacopoeias. In *Chin.* and *US.*
USP 31 (Salsalate). Store in airtight containers.

Adverse Effects, Treatment, and Precautions

As for Aspirin, p.20.

The use of aspirin and other acetylated salicylates is generally not recommended for children because of the risk of Reye's syndrome, unless specifically indicated. Some licensed product information extends this precaution to salsalate.

Effects on the gastrointestinal tract. Salsalate is associated with less faecal blood loss than aspirin and has been reported to cause fewer gastric lesions than piroxicam.[1] However, small-bowel ulcerations were reported in a patient when salsalate was added to a regimen of ranitidine and metoclopramide which had been prescribed for duodenal ulcer.[2]

1. Porro GB, *et al.* Salsalate in the treatment of rheumatoid arthritis: a double-blind clinical and gastroscopic trial versus piroxicam: II—endoscopic evaluation. *J Int Med Res* 1989; **17:** 320–3.
2. Souza Lima MA. Ulcers of the small bowel associated with stomach-bypassing salicylates. *Arch Intern Med* 1985; **145:** 1139.

Effects on the kidneys. A case of minimal-change nephrotic syndrome associated with salsalate use.[1]

1. Vallès M, Tovar JL. Salsalate and minimal-change nephrotic syndrome. *Ann Intern Med* 1987; **107:** 116.

Effects on the mouth. Ulcerated lesions on the tongue of a 77-year-old man were caused by taking salsalate tablets incorrectly.[1] The patient had placed the tablets under his tongue rather than swallowing them whole, resulting in prolonged, direct contact with the tongue.

1. Ruscin JM, Astroth JD. Lingual lesions secondary to prolonged contact with salsalate tablets. *Ann Pharmacother* 1998; **32:** 1248.

Interactions

For interactions associated with salicylates, see Aspirin, p.23.

Pharmacokinetics

Salsalate is insoluble in acidic gastric fluids but is soluble in the small intestine. One molecule of salsalate is hydrolysed to 2 molecules of salicylic acid; hydrolysis occurs both in the small intestine and after absorption of the parent compound. Additional details on the pharmacokinetics of salicylic acid are provided in aspirin (see p.23). Not all of the absorbed salsalate is hydrolysed and about 13% of salsalate is excreted as glucuronide conjugates in the urine; thus, the amount of salicylic acid available from salsalate is less than that from aspirin when the two drugs are given in equimolar equivalents of salicylic acid.

Uses and Administration

Salsalate is a salicylic acid derivative that has analgesic, anti-inflammatory, and antipyretic actions similar to those of aspirin (see p.23). It is used for pain and fever and also in inflammatory disorders such as osteoarthritis and rheumatoid arthritis. A usual oral dose is up to 3 g daily given in divided doses with food.

Preparations

USP 31: Salsalate Capsules; Salsalate Tablets.

Proprietary Preparations (details are given in Part 3)
USA: Amigesic; Argesic-SA; Artha-G; Disalcid; Marthritic; Mono-Gesic†; Salflex; Salsitab.

Sarracenia Purpurea

Pitcher Plant.

Profile

The roots and leaves of *Sarracenia purpurea* (Sarraceniaceae) have been used in the form of an aqueous distillate, given by local injection, for neuromuscular or neuralgic pain.

Preparations

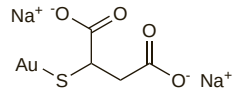
Proprietary Preparations (details are given in Part 3)
USA: Sarapin.

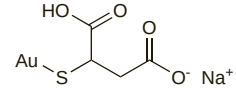
Sodium Aurothiomalate *(rINN)*

Aurothiomalate de Sodium; Aurotiomalato de sodio; Gold Sodium Thiomalate; Natrii aurothiomalas; Natrium-aurothiomalát; Natriumaurotiomalaatti; Natriumaurotiomalat; Sodium, aurothiomalate de; Sodium Aurothiosuccinate; Sodu aurotiojabłczan; Sodyum Orotiyomalat.

Натрия Ауротиомалат

CAS — 12244-57-4 (anhydrous xNa); 39377-38-3 (disodium monohydrate).
ATC — M01CB01.
ATC Vet — QM01CB01.





Pharmacopoeias. In *Eur.* (see p.vii), *Jpn*, and *US.*
Ph. Eur. 6.2 (Sodium Aurothiomalate). A mixture of monosodium and disodium salts of (2*RS*)-2-(aurosulphanyl)butanedioic acid. It contains 44.5 to 46.0% of gold and 10.8 to 11.8% of sodium, calculated with reference to the dried substance. A fine, pale yellow, hygroscopic powder. Very soluble in water; practically insoluble in alcohol and in dichloromethane. A 10% solution in water has a pH of 6.0 to 7.0. Store in airtight containers.
USP 31 (Gold Sodium Thiomalate). A mixture of the monosodium and disodium salts of gold thiomalic acid [(aurothio)succinic acid] ($C_4H_4AuNaO_4S$ = 368.1 and $C_4H_3AuNa_2O_4S$ = 390.1) that has a gold content of 44.8 to 49.6%, and 49.0 to 52.5% calculated on the dried alcohol-free and glycerol-free material. pH of a 10% solution in water is between 5.8 and 6.5. Store in airtight containers at a temperature of 25°, excursions permitted between 15° and 30°. Protect from light.

Adverse Effects

Reports show a wide range for the incidence of adverse effects of sodium aurothiomalate. However, some consider that with careful treatment about one-third of patients will experience adverse effects. It is also considered that about 5% of patients will experience severe adverse effects and that some of the effects will be fatal. The most common effects involve the skin and mucous membranes with pruritus (an early sign of intolerance) and stomatitis (often with a metallic taste) being the most prominent. Rashes with pruritus often occur after 2 to 6 months of intramuscular treatment and may require stopping therapy. Other reactions affecting the skin and mucous membranes include erythema, maculopapular eruptions, erythema multiforme, urticaria, eczema, seborrhoeic dermatitis, lichenoid eruptions, alopecia, exfoliative dermatitis, glossitis, pharyngitis, vaginitis, photosensitivity reactions, and irreversible pigmentation (chrysiasis).

Toxic effects on the blood include eosinophilia, thrombocytopenia, leucopenia, agranulocytosis, and aplastic anaemia.

Effects on the kidneys include mild transient proteinuria which may lead to heavy proteinuria, haematuria, and nephrosis.

Other effects reported include pulmonary fibrosis, dyspnoea, toxic hepatitis, cholestatic jaundice, peripheral neuritis, encephalitis, psychoses, fever, and gastrointestinal disorders including enterocolitis. Gold deposits may occur in the eyes. Vasomotor or nitritoid reactions, with weakness, flushing, palpitations, and syncope, may occur after injection of sodium aurothiomalate. Local irritation may also follow injection.

Sometimes there is an initial exacerbation of the arthritic condition.

Some adverse effects of gold have an immunogenic component.

◊ Reviews.

1. Tozman ECS, Gottlieb NL. Adverse reactions with oral and parenteral gold preparations. *Med Toxicol* 1987; **2:** 177–89.
2. van Roon EN, *et al.* Parenteral gold preparations. Efficacy and safety of therapy after switching from aurothioglucose to aurothiomalate. *J Rheumatol* 2005; **32:** 1026–30.

Effects on the blood. Blood disorders such as eosinophilia, leucopenia, granulocytopenia, and thrombocytopenia have occurred in patients receiving gold therapy. Eosinophilia has been reported to be the most frequent haematological abnormality.[1] It has been estimated that thrombocytopenia develops in 1 to 3% of patients receiving gold salts.[2]

Fatal consumption coagulopathy occurred in 4 children after the second injection of sodium aurothioglucose or sodium aurothiomalate.[3]

1. Foster RT. Eosinophilia—a marker of gold toxicity. *Can J Hosp Pharm* 1985; **85:** 150–1.
2. Coblyn JS, *et al.* Gold-induced thrombocytopenia: a clinical and immunogenetic study of twenty-three patients. *Ann Intern Med* 1981; **95:** 178–81.
3. Jacobs JC, *et al.* Consumption coagulopathy after gold therapy for JRA. *J Pediatr* 1984; **105:** 674–5.

Effects on the cardiovascular system. Vasomotor or nitritoid reactions associated with gold compounds are usually transient and self-limiting and although they may be mild there have been isolated reports of associated complications such as myocardial infarction, stroke, transient ischaemic attack, and transient monocular visual loss.[1] Most reactions have been associated with sodium aurothiomalate (a reported incidence of 4.7%) but they have also occurred with auranofin and sodium aurothioglucose. Tachyphylaxis usually occurs to the reactions and most patients are able to continue treatment but paradoxically in some the severity increases with repeated doses; 2.8% of patients receiving sodium aurothiomalate may require a change of treatment due to recurrent reactions. It is important to distinguish such reactions from true anaphylactic reactions to gold.[1] Patients taking ACE inhibitors may be at increased risk of nitritoid reactions.[2,3] Transfer of the patient to sodium aurothioglucose or re-