3. Marks JG, *et al.* North American Contact Dermatitis Group patch-test results, 1998 to 2000. *Am J Contact Dermat* 2003; **14:** 59–62.
4. Emonet S, *et al.* Anaphylaxis to oxybenzone, a frequent constituent of sunscreens. *J Allergy Clin Immunol* 2001; **107:** 556–7.
5. Yesudian PD, King CM. Severe contact urticaria and anaphylaxis from benzophenone-3 (2-hydroxy 4-methoxy benzophenone). *Contact Dermatitis* 2002; **46:** 55–6.

Preparations

USP 31: Dioxybenzone and Oxybenzone Cream.

Proprietary Preparations numerous preparations are listed in Part 3.

Arg.: Biorevit Labial; Lelco; ***Braz.:*** Solaquin.

Padimate *(BAN, rINN)*

Amyl Dimethylaminobenzoate; Isoamyl Dimethylaminobenzoate; Padimate A *(USAN)*; Padimato; Padimatum. A mixture of pentyl, isopentyl, and 2-methylbutyl 4-dimethylaminobenzoates .

Падимат

$C_{14}H_{21}NO_2$ = 235.3.

CAS — 14779-78-3 (pentyl 4-dimethylaminobenzoate); 21245-01-2 (isopentyl 4-dimethylaminobenzoate).

Profile

Padimate, a substituted aminobenzoate, is a sunscreen (p.1576) with actions similar to those of aminobenzoic acid (p.1589). It is effective against UVB light (for definitions, see p.1580).

Preparations

Proprietary Preparations some preparations are listed in Part 3.

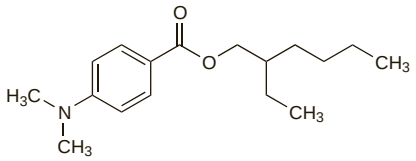
Padimate O *(BANM, USAN)*

Ethylhexyl Dimethyl PABA; Octyl Dimethyl PABA; Padimato O. 2-Ethylhexyl 4-(dimethylamino)benzoate.

Падимат О

$C_{17}H_{27}NO_2$ = 277.4.

CAS — 21245-02-3.



NOTE. Escalol 507 and Eusolex 6007 are trade names that have been used for padimate O.

Pharmacopoeias. In *US.*

USP 31 (Padimate O). A light yellow, mobile liquid with a faint aromatic odour. Practically insoluble in water, in glycerol, and in propylene glycol; soluble in alcohol, in isopropyl alcohol, and in liquid paraffin. Store in airtight containers. Protect from light.

Profile

Padimate O, a substituted aminobenzoate, is a sunscreen (p.1576) with actions similar to those of aminobenzoic acid (p.1589). It is effective against UVB light (for definitions, see p.1580).

Preparations

USP 31: Padimate O Lotion.

Proprietary Preparations some preparations are listed in Part 3.

Pimecrolimus *(BAN, USAN, rINN)*

ASM-981; Pimécrolimus; Pimecrolimús; Pimecrolimusum; Pimekrolimus; Pimekrolimuusi; SDZ-ASM-981. (3*S*,4*R*,5*S*,8*R*,9*E*,12*S*,-14*S*,15*R*,16*S*,18*R*,19*R*,26a*S*)-3-{(*E*)-2-[(1*R*,3*R*,4*S*)-4-Chloro-3-methoxycyclohexyl]-1-methylvinyl}-8-ethyl-5,6,8,11,12,13,14,-15,16,17,18,19,24,25,26,26a-hexadecahydro-5,19-dihydroxy-14,16-dimethoxy-4,10,12,18-tetramethyl-15,19-epoxy-3*H*-pyrido[2,1-*c*][1,4]oxaazacyclotricosine-1,7,20,21(4*H*,23*H*)-tetrone.

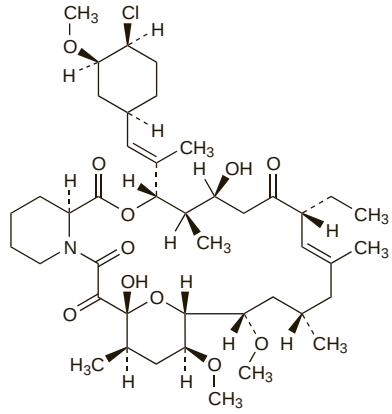
Пимекролимус

$C_{43}H_{68}ClNO_{11}$ = 810.5.

CAS — 137071-32-0.

ATC — D11AX15.

ATC Vet — QD11AX15.



Adverse Effects and Precautions

As for topical tacrolimus (p.1843).

The most frequent adverse effects of topical pimecrolimus are a burning sensation, irritation, pruritus, erythema, and skin infections at the application site. Rarely anaphylactic reactions, sometimes severe, have been reported.

Cases of lymphadenopathy have been reported in patients using pimecrolimus cream. Treatment with pimecrolimus should be stopped in patients who develop lymphadenopathy in the absence of a clear aetiology or in the presence of acute infectious mononucleosis. All patients should be monitored to ensure that the condition resolves.

Carcinogenicity. Carcinogenicity studies in *animals* and reports of malignancies in patients treated with topical calcineurin inhibitors prompted the FDA to issue an alert about the possible risk and to make recommendations about the appropriate use of pimecrolimus and tacrolimus (see under Tacrolimus, p.1843).

Interactions

Alcohol intolerance, described as flushing, rash, burning, itching, or swelling, has occurred rarely after the consumption of alcohol by patients using topical pimecrolimus.

Pharmacokinetics

There is minimal systemic absorption and no accumulation from topical use of pimecrolimus. Studies in *animals* and *in vitro* have found no evidence of metabolism in the skin.

Pimecrolimus is absorbed from the gastrointestinal tract after oral doses, and is about 74 to 87% bound to plasma proteins. It is metabolised in the liver by the cytochrome P450 isoenzyme CYP3A subfamily. About 78% of a single dose is eliminated in the faeces as metabolites and less than 1% as unchanged pimecrolimus. Only about 2.5% of a dose is eliminated in the urine, as metabolites.

◊ References.
1. Van Leent EJM, *et al.* Low systemic exposure after repeated topical application of pimecrolimus (Elidel , SD Z ASM 981) in patients with atopic dermatitis. *Dermatology* 2002; **204:** 63–8.
2. Scott G, *et al.* Pharmacokinetics of pimecrolimus, a novel nonsteroid anti-inflammatory drug, after single and multiple oral administration. *Clin Pharmacokinet* 2003; **42:** 1305–14.
3. Zollinger M, *et al.* Pimecrolimus: absorption, distribution, metabolism, and excretion in healthy volunteers after a single oral dose and supplementary investigations in vitro. *Drug Metab Dispos* 2006; **34:** 765–74.

Uses and Administration

Pimecrolimus is a macrolactam ascomycin derivative related to tacrolimus (p.1846) that acts as a calcineurin inhibitor and has similar anti-inflammatory and immunosuppressant actions. It is used for short-term and intermittent long-term treatment of mild to moderate atopic eczema (p.1579) in non-immunocompromised patients over the age of 2 years when conventional therapies are ineffective or unsuitable. Pimecrolimus is applied twice daily as a 1% cream until signs and symptoms clear. Treatment should be stopped if there is no improvement after 6 weeks or if eczema is exacerbated.

Oral forms of pimecrolimus are also being investigated for the treatment of psoriasis and atopic eczema.

◊ References.
1. Wellington K, Jarvis B. Topical pimecrolimus: a review of its clinical potential in the management of atopic dermatitis. *Drugs* 2002; **62:** 817–40.
2. Anonymous. Topical pimecrolimus (Elidel) for treatment of atopic dermatitis. *Med Lett Drugs Ther* 2002; **44:** 48–50.
3. Anonymous. Pimecrolimus cream for atopic dermatitis. *Drug Ther Bull* 2003; **41:** 33–6.
4. Papp K, *et al.* Effect of pimecrolimus cream 1% on the long-term course of pediatric atopic dermatitis. *Int J Dermatol* 2004; **43:** 978–83.
5. Meurer M, *et al.* Long-term efficacy and safety of pimecrolimus cream 1% in adults with moderate atopic dermatitis. *Dermatology* 2004; **208:** 365–72.
6. Ashcroft DM, *et al.* Efficacy and tolerability of topical pimecrolimus and tacrolimus in the treatment of atopic dermatitis: meta-analysis of randomised controlled trials. *BMJ* 2005; **330:** 516–22.
7. Papp KA, *et al.* Long-term control of atopic dermatitis with pimecrolimus cream 1% in infants and young children: a two-year study. *J Am Acad Dermatol* 2005; **52:** 240–6.
8. Wolff K, *et al.* Efficacy and tolerability of three different doses of oral pimecrolimus in the treatment of moderate to severe atopic dermatitis: a randomized controlled trial. *Br J Dermatol* 2005; **152:** 1296–1303.

Administration in infants. A 6-week, double-blind, randomised study of 186 infants between the age of 3 and 23 months, followed by a 20-week open-label phase, showed that 1% pimecrolimus cream, applied twice daily was both safe and effective in mild to moderate atopic eczema.[1] A review[2] of data from 10 studies that included 1133 infants between 3 and 23 months of age who were treated for up to 2 years found that the level of systemic exposure to pimecrolimus was very low and comparable to that observed in older children and adults. Treatment was reported to be effective and there was no evidence of immunosuppression or an increase in the rate of infections. Licensed product information, however, does not recommend its use in patients under 2 years of age as the effect of pimecrolimus cream on the developing immune system in infants is unknown (for concerns about possible carcinogenicity see above).

1. Ho VC, *et al.* Safety and efficacy of nonsteroid pimecrolimus cream 1% in the treatment of atopic dermatitis in infants. *J Pediatr* 2003; **142:** 155–62.
2. Paul C, *et al.* Safety and tolerability of 1% pimecrolimus cream among infants: experience with 1133 patients treated for up to 2 years. Abstract: *Pediatrics* 2006; **117:** 202–3. Full version: http://pediatrics.aappublications.org/cgi/reprint/117/1/e118 (accessed 27/09/07)

Lichen. There are a few case reports[1,2] of benefit from pimecrolimus 1% cream in the management of oral *lichen planus* (p.1580). In most cases it was applied twice daily, and in some cases adhesive gel or paste was also used. Improvement in oral lesions occurred within 2 to 4 weeks in 3 cases.[1] In a placebo-controlled study[3] of 20 patients with oral erosive lichen planus, pimecrolimus 1% cream was applied twice daily for 4 weeks. Although pain scores were reduced with pimecrolimus, the reduction in erythema was not maintained. There was also a trend towards an improvement in ulceration but changes in scores were not statistically significant. Topical pimecrolimus has also been tried in the management of genital lichen planus. In a series[4] of 11 women, 9 experienced benefit after 4 to 6 weeks of treatment; with follow-up of up to 10 months, 6 of them had experienced a complete response and 3 a partial response.

The resolution of signs and symptoms of *lichen sclerosus* (p.1580) has been reported in 7 female patients (aged 4 to 48 years) with the use of topical pimecrolimus 1% cream twice daily for 3 to 4 months.[5,6] A poor response was reported in a 62-year-old woman who used the cream less frequently because of burning and stinging.[5]

1. Esquivel-Pedraza L, *et al.* Treatment of oral lichen planus with topical pimecrolimus 1% cream. *Br J Dermatol* 2004; **150:** 771–3.
2. Dissemond J, *et al.* Pimecrolimus in an adhesive ointment as a new treatment option for oral lichen planus. *Br J Dermatol* 2004; **150:** 782–4.
3. Swift JC, *et al.* The effectiveness of 1% pimecrolimus cream in the treatment of oral erosive lichen planus. *J Periodontol* 2005; **76:** 627–35.
4. Lonsdale-Eccles AA, Velangi S. Topical pimecrolimus in the treatment of genital lichen planus: a prospective case series. *Br J Dermatol* 2005; **153:** 390–4.
5. Goldstein AT, *et al.* Pimecrolimus for the treatment of vulvar lichen sclerosus: a report of 4 cases. *J Reprod Med* 2004; **49:** 778–80.
6. Boms S, *et al.* Pimecrolimus 1% cream for anogenital lichen sclerosus in childhood. *BMC Dermatol* 2004; **4:** 14. Available at: http://www.biomedcentral.com/1471-5945/4/14 (accessed 27/09/07)

Psoriasis. Topical pimecrolimus may have some benefit[1] in the treatment of psoriasis (p.1583). Although studies have generally found it to be less effective than topical corticosteroids or topical calcipotriol,[2-4] one study[2] in patients with chronic plaque psoriasis did report that pimecrolimus 1% ointment applied under occlusion had a similar efficacy to clobetasol propionate 0.05% ointment.

Oral pimecrolimus is also under investigation and has reduced disease severity in dose-finding studies in patients with chronic plaque psoriasis.[5,6]

1. Gribetz C, *et al.* Pimecrolimus cream 1% in the treatment of intertriginous psoriasis: a double-blind, randomized study. *J Am Acad Dermatol* 2004; **51:** 731–8.
2. Mrowietz U, *et al.* The novel ascomycin derivative SDZ ASM 981 is effective for psoriasis when used topically under occlusion. *Br J Dermatol* 1998; **139:** 992–6.
3. Mrowietz U, *et al.* An experimental ointment formulation of pimecrolimus is effective in psoriasis without occlusion. *Acta Derm Venereol* 2003; **83:** 351–3.
4. Kreuter A, *et al.* 1% Pimecrolimus, 0.005% calcipotriol, and 0.1% betamethasone in the treatment of intertriginous psoriasis: a double-blind, randomized controlled study. *Arch Dermatol* 2006; **142:** 1138–43.
5. Rappersberger K, *et al.* Pimecrolimus identifies a common genomic anti-inflammatory profile, is clinically highly effective in psoriasis and is well tolerated. *J Invest Dermatol* 2002; **119:** 876–87.
6. Gottlieb AB, *et al.* Oral pimecrolimus in the treatment of moderate to severe chronic plaque-type psoriasis: a double-blind, multicentre, randomized, dose-finding trial. *Br J Dermatol* 2005; **152:** 1219–27.

Seborrhoeic dermatitis. Small studies[1,2] suggest that topical pimecrolimus has a similar efficacy to topical corticosteroids in the treatment of seborrhoeic dermatitis (p.1584). It has also been effective in a few cases that had not responded to topical corticosteroids.[3]

1. Rigopoulos D, *et al.* Pimecrolimus cream 1% vs. betamethasone 17-valerate 0.1% cream in the treatment of seborrhoeic dermatitis: a randomized open-label clinical trial. *Br J Dermatol* 2004; **151:** 1071–5.
2. Firooz A, *et al.* Pimecrolimus cream, 1%, vs hydrocortisone acetate cream, 1%, in the treatment of facial seborrheic dermatitis: a randomized, investigator-blind, clinical trial. *Arch Dermatol* 2006; **142:** 1066–7.
3. Cunha PR. Pimecrolimus cream 1% is effective in seborrhoeic dermatitis refractory to treatment with topical corticosteroids. *Acta Derm Venereol* 2006; **86:** 69–70.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: Elidel; ***Austral.:*** Elidel; ***Austria:*** Elidel; ***Belg.:*** Elidel; ***Braz.:*** Elidel; ***Canad.:*** Elidel; ***Chile:*** Elidel; ***Cz.:*** Elidel; ***Denm.:*** Elidel; ***Fin.:*** Elidel; ***Fr.:*** Elidel; ***Ger.:*** Douglan; Elidel; ***Gr.:*** Aregen; Elidel; ***Hong Kong:*** Elidel; ***Hung.:*** Elidel; ***Indon.:*** Elidel; ***Israel:*** Elidel; ***Ital.:*** Elidel; ***Malaysia:*** Elidel; ***Mex.:*** Elidel; ***Neth.:*** Elidel; ***Norw.:*** Elidel; ***NZ:*** Elidel; ***Philipp.:*** Elidel; ***Pol.:*** Elidel; ***Port.:*** Aregen; Elidel; ***Rus.:*** Elidel (Элидел); ***S.Afr.:*** Elidel; ***Singapore:*** Elidel; ***Spain:*** Elidel; Isaplic; Rizan; ***Swed.:*** Elidel; ***Switz.:*** Elidel; ***Thai.:*** Elidel; ***Turk.:*** Elidel; ***UK:*** Elidel; ***USA:*** Elidel; ***Venez.:*** Elidel.

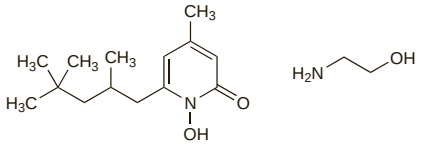
Piroctone Olamine *(USAN, rINNM)*

Piroctona olamina; Piroctoni Olaminum. 1-Hydroxy-4-methyl-6-(2,4,4-trimethylpentyl)-2(1*H*)-pyridone compound with 2-aminoethanol (1:1).

Пироктон Оламин

$C_{14}H_{23}NO_2,C_2H_7NO$ = 298.4.

CAS — 50650-76-5 (piroctone); 68890-66-4 (piroctone olamine).



Profile

Piroctone olamine has been used in shampoos for the treatment of dandruff.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: Lovilia†; Megacistin G†; Octopil†; Plusgel; ***Austral.:*** Neoceuticals Therapeutic Shampoo†; ***Braz.:*** Soapex; ***Fr.:*** Charlieu Antipelliculaire; Cystel Antipelliculaire†; Evolith DS; Topicrem Traitement PV; Traitement PV; ***Irl.:*** Saliker†; ***Ital.:*** Olamin P; ***Mex.:*** Betapirox; ***Venez.:*** Betapirox; Hair Stabil†; Sante Vite†.

Multi-ingredient: ***Arg.:*** Aspergun†; Micocert; Micodual; Pitiriax; Pityval†; Saliker†; Tersoderm Anticaspa†; ***Braz.:*** Ortosol P; Pityval; Saliker; ***Chile:*** Eucerin Shampoo Anticaspa; Foltene Research Anticaspa; KPL†; Neostrata; Node DS; Shampoo Anticaspa; ***Fr.:*** Alpha 5 DS†; Epiphane†; Hyfac soin keratolytique†; Ionax P; Item Alphakeptol; Kelual DS; Kerium Intensive; Liperol; Mela'aura; Node DS; Node P; Phytheol; Phytosquame; Pityker†; Pityval; PSO; Saliker†; Seborheane; T/Gel; ***Irl.:*** Effaclar AI; ***Ital.:*** Biophase Shampoo; Biothymus DS; Genisol; Nonak; Prurex; Shamday Antiforfora†; Tricoderm F; ***Port.:*** Alpha Septol; Alphakeptol†; Bioclin Sebo Care; Ionil P†; ***Spain:*** Ionax P†; ***UK:*** Atopiclair; ***USA:*** Atopiclair; ***Venez.:*** Kertyol; Node DS; Sensibio DS.

Podophyllum

American Mandrake; May Apple Root; Podófilo; Podofilum; Podoph.; Podophyllum Rhizome; Rizoma de podófilo.

Подофилл щитовидный (*Podophyllum peltatum*)

Pharmacopoeias. In *US*.

USP 31 (Podophyllum). The dried rhizomes and roots of *Podophyllum peltatum* (Berberidaceae). It yields not less than 5% of resin. It has a slight odour.

Indian Podophyllum

Ind. Podoph.; Indian Podophyllum Rhizome; Podófilo indio.

Подофилл гималайский (*Podophyllum emodi*)

Description. The dried fruits or rhizomes and roots of *Podophyllum hexandrum* (*P. emodi*) (Berberidaceae).

Podophyllum Resin

Podofilino; Podoph. Resin; Podophylli Resina; Podophyllin; Resina de podófilo.

Подофиллин

CAS — 8050-60-0.

Pharmacopoeias. In *Int.* and *US* (both from podophyllum only). In *Br.* from Indian podophyllum.

BP 2008 (Podophyllum Resin). The resin obtained from the rhizomes and roots of *Podophyllum hexandrum* (*P. emodi*). It contains not less than 50% of total aryltetralin lignans, calculated as podophyllotoxin.

An amorphous powder, varying in colour from light brown to greenish-yellow or brownish-grey masses, with a characteristic odour; caustic. On exposure to light or to temperatures above 25° it becomes darker in colour.

Partly soluble in hot water but precipitated again on cooling; partly soluble in chloroform, in ether, and in dilute ammonia solution. Protect from light.

USP 31 (Podophyllum Resin). The powdered mixture of resins extracted from podophyllum (the rhizomes and roots of *Podophyllum peltatum*) by percolation with alcohol and subsequent precipitation with acidified water. It contains not less than 40% and not more than 50% of hexane-insoluble matter.

An amorphous caustic powder, varying in colour from light brown to greenish-yellow. On exposure to light or to temperatures above 25° it becomes darker in colour.

Soluble in alcohol with a slight opalescence; partially soluble in chloroform and in ether. A solution in alcohol is acid to litmus. Store in airtight containers. Protect from light.

Podophyllotoxin *(BAN)*

Podofilotoxina; Podofilox *(USAN)*; Podofyllotoksiini; Podofyllotoxin; Podophyllotoxinum. (5*R*,5a*R*,8a*R*,9*R*)-5,5a,6,8,8a,9-Hexahydro-9-hydroxy-5-(3,4,5-trimethoxyphenyl)furo[3′4′:6,7]naphtho[2,3-*d*]-1,3-dioxol-6-one.

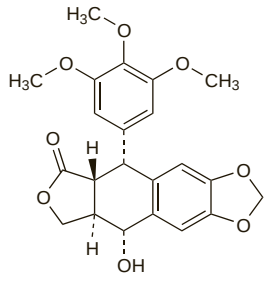
Подофиллотоксин

$C_{22}H_{22}O_8$ = 414.4.

CAS — 518-28-5.

ATC — D06BB04.

ATC Vet — QD06BB04.



Adverse Effects

Podophyllum is very irritant, especially to the eyes and mucous membranes. It can also cause severe systemic toxicity after ingestion or topical application, which is usually reversible but has been fatal. Symptoms of toxicity include nausea, vomiting, abdominal pain, and diarrhoea; there may be thrombocytopenia, leucopenia, renal failure, and hepatotoxicity. Central effects are delayed in onset and prolonged in duration and include acute psychotic reactions, hallucinations, confusion, dizziness, stupor, ataxia, hypotonia, seizures, and coma. EEG changes may persist for several days. Peripheral and autonomic neuropathies develop later and may result in paraesthesias, reduced reflexes, muscle weakness, tachycardia, apnoea, orthostatic hypotension, paralytic ileus, and urinary retention. Neuropathy may persist for several months.

Poisoning. Reports and reviews of podophyllum toxicity.[1-7] A few of the cases followed consumption of herbal preparations containing podophyllum or the related plant bajiaolian (*Dysosma pleianthum*). Death has occurred after ingestion of 10 g of podophyllum.

1. Cassidy DE, *et al.* Podophyllum toxicity: a report of a fatal case and a review of the literature. *J Toxicol Clin Toxicol* 1982; **19:** 35–44.
2. Dobb GJ, Edis RH. Coma and neuropathy after ingestion of herbal laxative containing podophyllin. *Med J Aust* 1984; **140:** 495–6.
3. Holdright DR, Jahangiri M. Accidental poisoning with podophyllin. *Hum Exp Toxicol* 1990; **9:** 55–6.
4. Tomczak RL, Hake DH. Near fatal systemic toxicity from local injection of podophyllin for pedal verrucae treatment. *J Foot Surg* 1992; **31:** 36–42.
5. Kao W-F, *et al.* Podophyllotoxin intoxication: toxic effect of bajiaolian in herbal therapeutics. *Hum Exp Toxicol* 1992; **11:** 480–7.
6. Chan TYK, Critchley JAJH. Usage and adverse effects of Chinese herbal medicines. *Hum Exp Toxicol* 1996; **15:** 5–12.
7. Chu CC, *et al.* Sensory neuropathy due to bajiaolian (podophyllotoxin) intoxication. *Eur Neurol* 2000; **44:** 121–3.

Precautions

The risk of systemic toxicity after topical application of podophyllum is increased by the treatment of large areas with excessive amounts for prolonged periods, by the treatment of friable, bleeding, or recently biopsied warts, and by inadvertent application to normal skin or mucous membranes.

Podophyllum should not be used during pregnancy or breast feeding. There are few reports of use during pregnancy and a teratogenic risk cannot be ruled out. Adverse systemic effects in the mother would also be undesirable during pregnancy, and there are other non-drug treatments available for the treatment of anogenital warts. It is not known whether podophyllum is distributed into breast milk.

Handling. Podophyllum resin is strongly irritant to the skin, eyes, and mucous membranes and requires careful handling.

Uses and Administration

Podophyllum resin and podophyllotoxin have an antimitotic action and are used principally as topical treatments for anogenital warts (condylomata acuminata). Podophyllum resin and podophyllotoxin may be used on external genital and perianal warts; podophyllum resin may also be used on urethral meatus warts. However, neither of these compounds should be used to treat warts on mucous membranes, including vaginal, cervical, intra-urethral, intra-anal, and rectal warts.

Podophyllum resin is usually formulated in compound benzoin tincture in strengths of 15% Indian podophyllum resin or 10 to 25% American podophyllum resin. Lower concentrations of American podophyllum resin in alcoholic solutions have been used. The solution is left on the warts for 1 to 6 hours, and then washed off. Only a small area or number of warts should be treated at any one time and care must be taken to avoid application to healthy tissue. This procedure is carried out once a week for up to 3 to 6 weeks. Preparations containing podophyllotoxin 0.5% in alcohol or alcoholic gel or podophyllotoxin 0.15% cream are used similarly. They are applied twice daily for 3 days but not washed off. Treatment may be repeated at weekly intervals for up to a total of 4 or 5 weeks of treatment. Podophyllum resin is also used with other keratolytics for the removal of plantar warts.

Although podophyllum resin and podophyllotoxin preparations are generally not used in children, see below.

When taken orally podophyllum resin is highly irritant to the intestinal mucosa and produces violent peristalsis resulting in a drastic purging action. It has been superseded by less toxic laxatives.

Podophyllum has been used in homoeopathic medicine.

Administration in children. The use of podophyllum resin and podophyllotoxin preparations in children is generally avoided because of the potential for severe local irritation and systemic toxicity. Nonetheless, podophyllotoxin has been used for the