Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Arg.:*** Nubevital BB; Nubevital Sunblock Ultra; Refrane Plus; ***Braz.:*** Sunmax Acqua; ***Canad.:*** Hawaiian Tropic Herbal†; ***Chile:*** Hidrafil; Spectraban 55; ***Mex.:*** Spectraban 55; ***USA:*** Hawaiian Tropic Protective Tanning Dry.

T4 Endonuclease V

Bacteriophage T4 Endodeoxyribonuclease V; T4N5. Coliphage T4 endodeoxyribonuclease V.

T4 Эндонуклеаза V

CAS — 52227-85-7.

Profile

T4 endonuclease V is a DNA-repair enzyme that is reported to remove DNA damaged by UV radiation. It is under investigation to reduce the incidence of actinic keratosis and basal cell carcinoma in patients with xeroderma pigmentosum (see Photosensitivity Disorders, p.1581).

◊ References.

1. Wolf P, *et al.* Topical treatment with liposomes containing T4 endonuclease V protects human skin in vivo from ultraviolet-induced upregulation of interleukin-10 and tumor necrosis factor-α. *J Invest Dermatol* 2000; **114:** 149–56.
2. Yarosh D, *et al.* Effect of topically applied T4 endonuclease V in liposomes on skin cancer in xeroderma pigmentosum: a randomised study. *Lancet* 2001; **357:** 926–9.

Tacalcitol *(BAN, rINN)*

1α,24-Dihydroxycholecalciferol; 1α,24-Dihydroxyvitamin D_3; Tacalcitolum; Takalsitol. (+)-(5*Z*,7*E*,24*R*)-9,10-Secocholesta-5,7,10(19)-triene-1α,3β,24-triol monohydrate.

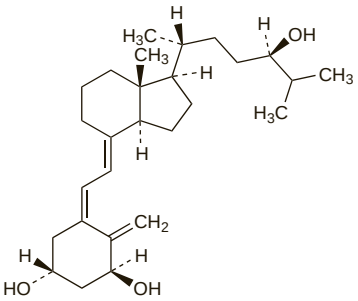
Такальцитол

$C_{27}H_{44}O_3,H_2O$ = 434.7.

CAS — 57333-96-7 (anhydrous tacalcitol); 93129-94-3 (tacalcitol monohydrate).

ATC — D05AX04.

ATC Vet — QD05AX04.



Adverse Effects and Precautions

As for Calcipotriol, p.1591. Paraesthesia may also occur. Tacalcitol may be applied to the face, but care should be taken to avoid the eyes. Tacalcitol may be degraded by UV radiation (see Uses and Administration, below).

Uses and Administration

Tacalcitol is a vitamin D_3 derivative, with actions and uses similar to those of calcipotriol (p.1592).

Tacalcitol is applied topically in the management of plaque psoriasis (p.1583). It is used as the monohydrate, but the concentration is expressed in terms of anhydrous tacalcitol; 4.17 micrograms of tacalcitol monohydrate is equivalent to about 4 micrograms of tacalcitol. It is applied as an ointment containing the equivalent of tacalcitol 4 micrograms/g (0.0004%). Applications are made once daily, preferably at bedtime, and no more than 10 g of ointment should be applied each day. Duration of treatment depends on the severity of the lesions; continuous and intermittent treatments for up to 12 months have been used.

Tacalcitol may be degraded by UV radiation and therefore if combined with UV therapy, the radiation should be given in the morning and tacalcitol applied at bedtime.

◊ References.

1. Peters DC, Balfour JA. Tacalcitol. *Drugs* 1997; **54:** 265–71.
2. Gollnick H, Menke T. Current experience with tacalcitol ointment in the treatment of psoriasis. *Curr Med Res Opin* 1998; **14:** 213–18.
3. Harrison PV. Topical tacalcitol treatment for psoriasis. *Hosp Med* 2000; **61:** 402–5.
4. Van de Kerkhof PCM, *et al.* Long-term efficacy and safety of tacalcitol ointment in patients with chronic plaque psoriasis. *Br J Dermatol* 2002; **146:** 414–22.
5. Lecha M, *et al.* Tacalcitol in the treatment of psoriasis vulgaris: the Spanish experience. *J Eur Acad Dermatol Venereol* 2005; **19:** 414–17.

Preparations

Proprietary Preparations (details are given in Part 3)

Arg.: Bonalfa†; ***Austria:*** Curatoderm; ***Belg.:*** Curatoderm; ***Chile:*** Bonalfa; ***Cz.:*** Curatoderm; ***Fr.:*** Apsor; ***Ger.:*** Curatoderm; ***Hung.:*** Curatoderm; ***Israel:*** Curatoderm; ***Ital.:*** Ticlapsor; Vellutan; ***Jpn:*** Bonalfa; ***Mex.:*** Bonalfa; ***Pol.:*** Curatoderm; ***Port.:*** Bonalfa; ***Spain:*** Bonalfa; ***Switz.:*** Curatoderm; ***UK:*** Curatoderm; ***Venez.:*** Bonalfa†.

Purified Talc

E553(b); Mastek; Powdered Talc; Purified French Chalk; Talc; Talco (esteatita); Talco purificado; Talcum; Talcum Purificatum; Talk; Talkas; Talkki; Talkum.

Очищенный Тальк

CAS — 14807-96-6.

Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), *Int.*, *Jpn*, *US*, and *Viet.*

Ph. Eur. 6.2 (Talc; Purified Talc BP 2008). A powdered, selected, natural, hydrated, magnesium silicate. Pure talc has the formula $Mg_3Si_4O_{10}(OH)_2$; it may contain varying amounts of associated minerals. A light, homogeneous, white or almost white powder, greasy to the touch (non-abrasive). It should be free from asbestos. Practically insoluble in water, in alcohol, and in dilute solutions of acids and of alkali hydroxides.

USP 31 (Talc). A powdered, selected, natural, hydrated magnesium silicate. It may contain variable amounts of associated minerals among which chlorites (hydrated aluminium and magnesium silicates), magnesite (magnesium carbonate), calcite (calcium carbonate), and dolomite (calcium and magnesium carbonate) are predominant. A very fine, white or greyish-white, unctuous crystalline powder, which adheres readily to the skin, and is free from grittiness.

Adverse Effects and Precautions

Contamination of wounds or body cavities with talc is liable to cause granulomas and it should not be used for dusting surgical gloves.

Inhalation of talc can cause respiratory irritation; prolonged exposure may produce pneumoconiosis.

The most common adverse effects of talc pleurodesis are chest pain and fever. More serious complications that can occur include empyema, pneumonitis, dyspnoea, hypoxaemia, pulmonary oedema, pulmonary embolism, acute respiratory distress syndrome, and respiratory failure. Cardiovascular complications such as tachycardia, myocardial infarction, hypotension, hypovolaemia, and asystolic arrest have also occurred in patients treated with talc pleurodesis. However, the role of talc in serious complications is not always clear as the underlying condition of patients with malignant pleural effusion and the procedure itself are likely to be contributing factors.

Talc is liable to be heavily contaminated with bacteria, including *Clostridium tetani, Cl. welchii,* and *Bacillus anthracis.* When used in dusting powders or to treat pneumothorax and pleural effusions, it should be sterilised.

Abuse. Adverse pulmonary and ocular effects have been associated with the presence of talc in abused substances. It may be present as an excipient in oral medications that are crushed then dissolved and injected, or it may have been purposely added as a filler to the abused substance. When injected intravenously, the insoluble talc particles can embolise in small pulmonary vessels causing occlusion and pulmonary hypertension. The particles may also then migrate into the pulmonary interstitium, inducing a foreign-body reaction and fibrosis. Irregular nodules can develop in the lungs, which may coalesce to form conglomerate masses.[1] Talc retinopathy is described as deposits of crystalline talc embolising in the retinal microvasculature after intravenous injection.[2-4] Pulmonary granulomas[5] and talc retinopathy[6] have also been described after nasal inhalation of abused substances containing talc.

1. Gotway MB, *et al.* Thoracic complications of illicit drug use: an organ system approach. *Radiographics* 2002; **22** (suppl): S119–S135.
2. Martidis A, *et al.* Talc embolism: a static retinopathy. *Am J Ophthalmol* 1997; **124:** 841–3.
3. Fraser-Bell S, Capon M. Talc retinopathy. *Clin Experiment Ophthalmol* 2002; **30:** 432–3.
4. El-Jabali F, Cohen S. Talc retinopathy. *N Engl J Med* 2006; **354:** e11. Available at: http://content.nejm.org/cgi/reprint/354/12/e11.pdf (accessed 27/09/07)
5. Johnson DC, *et al.* Foreign body pulmonary granulomas in an abuser of nasally inhaled drugs. *Pediatrics* 1991; **88:** 159–61.
6. Kumar RL, *et al.* Crystalline retinopathy from nasal ingestion of methamphetamine. *Retina* 2006; **26:** 823–4.

Carcinogenicity. A review by a working group of the International Agency for Research on Cancer concluded that there was inadequate evidence to confirm whether purified talc was carcinogenic in humans but there was sufficient evidence to confirm that talc containing asbestiform fibres was carcinogenic to man.[1] There have been suggestions of a link between the use of talc and ovarian cancer[2] but although a case-controlled study suggested an approximate doubling of the risk among women after perineal use of talc the working group noted that information was not available on the asbestos content of the talcs.[1] Further case-controlled studies have also reported a positive association between perineal talc use and ovarian cancer, although others have found no association. A large prospective cohort study[3] that included 78 630 women found little support for an association overall, although from an analysis by histological subtype there appeared to be a modest increase in the risk for serous invasive cancer. A meta-analysis[4] that included this cohort study and 15 case-controlled studies did find a positive association between any exposure to perineal talc and the risk of developing ovarian cancer (relative risk 1.33; 95% confidence interval 1.16 to 1.45). However, the authors highlighted possible selection bias and confounding factors that may have resulted in a false-positive association. There was a lack of a clear dose-response relationship, different results for hospital-based and population-based patients, and the timing of exposure to talc in relation to cancer diagnosis was not always known.

An analysis of epidemiological studies in workers involved in milling the raw mineral (not containing asbestos-like fibres) found no evidence of an increased risk of lung cancer; there was some evidence of an excess among miners or other industrial workers exposed to talc, but these populations were also exposed to other potential carcinogens.[5]

1. IARC/WHO. Silica and some silicates. *IARC monographs on the evaluation of the carcinogenic risk of chemicals to humans volume 42* 1987. Available at: http://monographs.iarc.fr/ENG/Monographs/vol42/volume42.pdf (accessed 27/09/07)
2. Longo DL, Young RC. Cosmetic talc and ovarian cancer. *Lancet* 1979; **ii:** 349–51.
3. Gertig DM, *et al.* Prospective study of talc use and ovarian cancer. *J Natl Cancer Inst* 2000; **92:** 249–52.
4. Huncharek M, *et al.* Perineal application of cosmetic talc and risk of invasive epithelial ovarian cancer: a meta-analysis of 11,933 subjects from sixteen observational studies. *Anticancer Res* 2003; **23:** 1955–60.
5. Wild P. Lung cancer risk and talc not containing asbestiform fibres: a review of the epidemiological evidence. *Occup Environ Med* 2006; **63:** 4–9.

Effects on the lungs. Acute respiratory failure has occurred in patients treated with talc pleurodesis, given either as a slurry or by insufflation. In a series of 338 patients treated with insufflation, 4 developed acute respiratory failure and 3 of them died.[1] In another series[2] of 78 patients who underwent 89 procedures using slurry or insufflation, respiratory complications developed after 24 procedures including acute respiratory distress syndrome after 8 procedures in 7 patients of whom 1 died. In a debate based on these and other reports, including some series in which there were no respiratory complications, it was argued[3] that although the risk of acute respiratory distress is small the use of talc for pleurodesis should be abandoned in favour of other drugs such as tetracyclines or bleomycin, or mechanical abrasion of the pleura. The opposing view[4] was that there were many possible causes for acute respiratory distress in these cases, and that talc was still the best pleurodesis agent available. In a prospective randomised comparison in patients with malignant pleural effusion,[5] respiratory complications were more common with insufflation than slurry. The authors noted that the role of talc in causing acute respiratory complications of pleurodesis is unclear and further study is needed.

It has been suggested that acute respiratory distress syndrome after talc pleurodesis may be related to the talc particle size. There were no such reactions in a study[6] of 558 patients given large-particle (mean size 24.5 μm) talc insufflation, and the authors suggested that reported cases appeared to occur in countries where talc products contained higher concentrations of small particles (less than 5 μm).

For other effects on the lungs, see under Abuse, above and Infant Skin Care, below.

1. Campos JRM, *et al.* Respiratory failure due to insufflated talc. *Lancet* 1997; **349:** 251–2.
2. Rehse DH, *et al.* Respiratory failure following talc pleurodesis. *Am J Surg* 1999; **177:** 437–40.
3. Light RW. Talc should not be used for pleurodesis. *Am J Respir Crit Care Med* 2000; **162:** 2024–6.
4. Sahn SA. Talc should be used for pleurodesis. *Am J Respir Crit Care Med* 2000; **162:** 2023–4.
5. Dresler CM, *et al.* Phase III intergroup study of talc poudrage vs talc slurry sclerosis for malignant pleural effusion. *Chest* 2005; **127:** 909–15.
6. Janssen JP, *et al.* Safety of pleurodesis with talc poudrage in malignant pleural effusion: a prospective cohort study. *Lancet* 2007; **369:** 1535–9.

Infant skin care. The routine use of non-medicated powders in the skin care of infants can be hazardous and their use should be discouraged.[1,2] Talc acts as a pulmonary irritant and inhalation of baby-powders by infants has caused severe respiratory difficulties and several deaths have been reported. Careful respiratory monitoring is indicated in children suspected of inhaling talcum powder as the onset of symptoms may be delayed for several

hours.[1] There have also been reports of umbilical granulomas resulting from contamination of umbilical stumps with talcum powder used for skin care.[2]

1. Pairaudeau PW, *et al.* Inhalation of baby powder: an unappreciated hazard. *BMJ* 1991; **302:** 1200–1.
2. Sparrow SA, Hallam LA. Talc granulomas. *BMJ* 1991; **303:** 58.

Uses and Administration

Purified talc is used in massage and as a dusting powder to allay irritation and prevent chafing. It is usually mixed with starch, to increase absorption of moisture, and zinc oxide. Talc used in dusting powders should be sterilised. Purified talc is used as a lubricant and diluent in making tablets and capsules and to clarify liquids.

Sterile purified talc is also used as a sclerosant after drainage of malignant pleural effusion and for recurrent spontaneous pneumothorax. It is administered into the pleural cavity as a slurry or by aerosol (insufflation). Doses of about 5 g may be used for pleural effusion and 2 g for pneumothorax.

Pleural effusions. Talc is used as a sclerosant to achieve pleurodesis in the management of benign and malignant pleural effusions (p.659) and recurrent spontaneous pneumothorax.[1-4] It is generally given into the pleural space as a slurry via intercostal tube, or by insufflation (talc poudrage) at thoracoscopy. Most reports have used a dose of 2 to 5 g, but doses have ranged from 1 to 10 g. A study[5] of talc pleurodesis in patients with malignant pleural effusion found both slurry and insufflation to be equally effective. The most common adverse effects associated with this use of talc are pain and fever. Other reported effects have included local infection and empyema, cardiovascular complications, and respiratory failure (see also Effects on the Lungs, above).

1. Kennedy L, Sahn SA. Talc pleurodesis for the treatment of pneumothorax and pleural effusion. *Chest* 1994; **106:** 1215–22.
2. de Campos JRM, *et al.* Thoracoscopy talc poudrage: a 15 year experience. *Chest* 2001; **119:** 801–6.
3. Antunes G, *et al.* British Thoracic Society. BTS guidelines for the management of malignant pleural effusions. *Thorax* 2003; **58** (suppl 2): ii29–ii38. Also available at: http://www.brit-thoracic.org.uk/Portals/0/Clinical%20Information/Pleural%20Disease/Guidelines/PleuralDiseaseMalignantPE.pdf (accessed 28/07/08)
4. Henry M, *et al.* British Thoracic Society. BTS guidelines for the management of spontaneous pneumothorax. *Thorax* 2003; **58** (suppl 2): ii39–ii52. Also available at: http://www.brit-thoracic.org.uk/Portals/0/Clinical%20Information/Pleural%20Disease/Guidelines/PleuralDiseaseSpontaneous.pdf (accessed 28/07/08)
5. Dresler CM, *et al.* Phase III intergroup study of talc poudrage vs talc slurry sclerosis for malignant pleural effusion. *Chest* 2005; **127:** 909–15.

Preparations

BP 2008: Talc Dusting Powder.

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

Multi-ingredient: ***Arg.:*** Dr Selby; ***Austral.:*** ZSC; ***Austria:*** Cutimix; Herposicc; Prurimix; Rombay; ***Belg.:*** Aloplastine; ***Braz.:*** Pasta d'Agua†; Pomaderme; Talco Alivio†; ***Chile:*** Hansaplast Footcare; ***Cz.:*** Cutimix†; Prurimix†; ***Fr.:*** Aloplastine; Eryange†; Poudre du Marcheur; ***Indon.:*** Minos; Yanthi Baby & Bath Powder; ***Israel:*** Pedisol; ***Malaysia:*** Rowarolan; ***Mex.:*** Hipoglos; ***NZ:*** Grans Remedy; Lamisil Odor Eze; ***Philipp.:*** Johnson's Baby Double Protection Powder; ***Pol.:*** Pedipur; ***Port.:*** Cuidaderma; ***Spain:*** Amniolina; Ictiomen; Pomada Infantil Vera†; ***Switz.:*** Tanno-Hermal; ***Turk.:*** Cinkos; ***USA:*** Columbia Antiseptic Powder; ***Venez.:*** Hipoglos con Hidrocortisona†; Hipoglos†.

Tars and Tar Oils

Breas y aceites de brea.

Birch Tar Oil

Aceite de abedul; Aceite de brea de abedul; Birkenteer; Goudron de Bouleau; Oleum Betulae Albae; Oleum Betulae Empyreumaticum; Oleum Betulae Pyroligneum; Oleum Rusci; Pix Betulae; Pyroleum Betulae.

Масло Берестового Дёгтя

Description. Birch tar oil is obtained by the destructive distillation of the wood and bark of the silver birch, *Betula verrucosa* (*B. pendula*; *B. alba*), and the birch, *B. pubescens* (Betulaceae); the distillate is allowed to stand and the oily upper layer separated from the residual tar.

Cade Oil

Alquitrán de Enebro; Ardıç Katranı; Brea de enebro; Goudron de Cade; Juniper Tar; Juniper Tar Oil; Kad Yağı; Kadeöl; Oleum Cadinum; Oleum Juniperi Empyreumaticum; Pix Cadi; Pix Juniperi; Pix Oxycedri; Pyroleum Juniperi; Pyroleum Oxycedri; Wacholderteer.

Можжевеловое Масло

Description. Cade oil contains guaiacol, ethylguaiacol, creosol, and cadinene.

Pharmacopoeias. In *US.*
USP 31 (Juniper Tar). The empyreumatic volatile oil obtained from the woody portions of *Juniperus oxycedrus* (Pinaceae). It is a dark brown, clear, thick liquid with a tarry odour. Very slightly soluble in water; soluble 1 in 9 of alcohol; soluble 1 in 3 of ether leaving only a slight flocculent residue; partially soluble in petroleum spirit; miscible with amyl alcohol, with chloroform, and with glacial acetic acid. Store in airtight containers at a temperature not exceeding 40°. Protect from light.

Coal Tar

Alcatrão Mineral; Alquitrán de hulla; Brea de hulla; Crude Coal Tar; Goudron de Houille; Kamenouhelný dehet; Katran; Oleum Lithanthracis; Pix Carbon.; Pix Carbonis; Pix Lithanthracis; Pix Mineralis; Pyroleum Lithanthracis; Steinkohlenteer.

Каменноугольная Смола

Description. Prepared coal tar is commercial coal tar heated at 50° for 1 hour.
Alcoholic solutions of coal tar or prepared coal tar prepared with the aid of polysorbate have been referred to as Liquor Picis Carbonis and Liquor Carbonis Detergens.

Pharmacopoeias. In *Br., Fr., Int.,* and *US.*
BP 2008 (Coal Tar). A product obtained by the destructive distillation of bituminous coal at a temperature of about 1000°. A nearly black, viscous liquid with a strong characteristic penetrating odour. On exposure to air it gradually becomes more viscous. It burns in air with a luminous sooty flame. Slightly soluble in water; partly soluble in absolute alcohol, in chloroform, in ether, and in volatile oils. A saturated solution is alkaline to litmus.
USP 31 (Coal Tar). The tar obtained by the destructive distillation of bituminous coal at temperatures in the range of 900° to 1100°. It may be processed further either by extraction with alcohol and suitable dispersing agents and maceration times or by fractional distillation with or without the use of suitable organic solvents.
A nearly black, viscous liquid with a characteristic naphthalene-like odour. Slightly soluble in water to which it imparts an alkaline reaction; partially soluble in alcohol, in acetone, in carbon disulfide, in chloroform, in ether, in methyl alcohol, and in petroleum spirit; more soluble in benzene; almost completely soluble in nitrobenzene. Store in airtight containers.

Tar

Alquitrán vegetal; Brea; Brea de pino; Brea vegetal; Goudron Végétal; Nadelholzteer; Pine Tar; Pix Abietinarum; Pix Liquida; Pix Pini; Pyroleum Pini; Wood Tar.

Древесная Смола; Древесный Дёготь

Pharmacopoeias. In *Br.*
BP 2008 (Tar). A bituminous liquid obtained from the wood of various trees of the family Pinaceae by destructive distillation. It is known in commerce as Stockholm Tar. A dark brown or nearly black semi-liquid with a characteristic empyreumatic odour; it is heavier than water. Soluble in alcohol (90%), in chloroform, in ether, and in fixed and volatile oils. The aqueous liquid obtained by shaking 1 g with 20 mL of water for 5 minutes is acidic to litmus paper.

Storage. When stored for some time tar separates into a layer which is granular in character due to minute crystallisation of catechol, resin acids, etc. and a surface layer of a syrupy consistence.

Adverse Effects and Precautions

Tars and tar oils may cause irritation and acne-like eruptions of the skin and should not be applied to inflamed or broken skin, mucosa, or the anogenital area. They should be used with caution on the face and skin flexures. Hypersensitivity reactions are rare but wood tars are more likely to cause sensitisation than coal tar. However, unlike wood tars, coal tar has a photosensitising action. Preparations of refined tar products appear to be less likely than crude tars to stain the skin, hair, and clothing.

Depending on their composition the systemic effects of tars and tar oils are similar to those for phenol (see p.1656).

Carcinogenicity. Coal tar and coal tar distillates contain a number of known and potential carcinogens including benzene, naphthalene, and other polycyclic aromatic hydrocarbons.[1] Studies of occupational exposure (for example, during coke production, coal gasification, and aluminium production) have found systemic absorption of significant amounts of polycyclic aromatic hydrocarbons,[2] and increases in the risks of developing a range of cancers.[1,2] Systemic absorption of polycyclic aromatic hydrocarbons has also been measured after the application of coal tar preparations used in the treatment of skin conditions.[2] However, although an increased risk of skin carcinoma was found[3] in 59 patients with psoriasis who had had very high exposures to tar and/or UV radiation, other cohort studies[4-6] found no increase in the risk of developing cancers from coal tar, even after long-term use.

1. National Toxicology Program. Coal tars and coal tar pitches. *Rep Carcinog* 2002; **10:** 68–70.
2. van Schooten F-J, Godschalk R. Coal tar therapy: is it carcinogenic? *Drug Safety* 1996; **15:** 374–7.
3. Stern RS, *et al.* Skin carcinoma in patients with psoriasis treated with topical tar and artificial ultraviolet radiation. *Lancet* 1980; **i:** 732–5.
4. Pittelkow MR, *et al.* Skin cancer in patients with psoriasis treated with coal tar. *Arch Dermatol* 1981; **117:** 465–8.
5. Jones SK, *et al.* Further evidence of the safety of tar in the management of psoriasis. *Br J Dermatol* 1985; **113:** 97–101.
6. Stern RS, Laird N. The carcinogenic risk of treatments for severe psoriasis. *Cancer* 1994; **73:** 2759–64.

Extemporaneous preparation. Concern about the possible carcinogenic potential of coal tar (see above) led the Health and Safety Executive in the UK to recommend that gloves for chemical protection, as opposed to disposable surgeon's gloves, should be worn during the extemporaneous preparation of formulations containing coal tar.[1]

1. Anonymous. Chemical protection gloves recommended for coal tar ointments. *Pharm J* 1997; **259:** 757.

Uses and Administration

Tars and tar oils can reduce the thickness of the epidermis. They are antipruritic and may be weakly antiseptic. They are used topically in eczema (p.1579), psoriasis (below), dandruff, seborrhoeic dermatitis (p.1584), and other skin disorders. Coal tar preparations have largely replaced the use of wood tars. Ultraviolet (UVB) light increases the efficacy of coal tar in the treatment of psoriasis.

Some wood tars, including creosote (p.1555) have been used in expectorant preparations.

Nonprescription use. After a review of products for safety and efficacy the FDA ruled that cade oil or tar should not be used in nonprescription shampoos[1] and that tar should no longer be included in nonprescription expectorants.[2]

1. Anonymous. Nonprescription drug review gains momentum. *WHO Drug Inf* 1991; **5:** 62.
2. Anonymous. FDA announces standards for nonprescription sleep-aid products and expectorants. *Clin Pharm* 1989; **8:** 388.

Psoriasis. Coal tar has long been employed in the treatment of psoriasis (p.1583), and used alone or with dithranol and/or ultraviolet light it continues to be a first-line option, although its use is declining. It is particularly suited to the treatment of stable chronic plaque psoriasis. Its mode of action is unknown but it is considered to have antiproliferative and anti-inflammatory activity, producing a reduction in the thickness of viable epidermis. Crude tar preparations are rather messy and unpleasant; refined products may be more aesthetically acceptable and less likely to stain skin, hair, and clothing although some consider them to be less effective.

Treatments usually start with concentrations equivalent to 0.5 to 1% of crude coal tar with the concentration being increased as necessary every few days up to a maximum of 10%. The higher strength preparations may be required for the management of thicker patches of psoriasis but the British Association of Dermatologists considers that coal tar preparations of between 1 and 5% in white or yellow soft paraffin are as effective as higher concentrations, and that the use of higher concentrations, which has been traditionally advocated, has no evidence-based foundation and is best avoided, especially as it restricts outpatient use.

Coal tar may not clear psoriasis as fast as other agents but extended periods of remission can be obtained with its use. The Goeckerman regimen utilises the enhanced efficacy obtained when coal tar is applied before exposure to ultraviolet (UVB) light. The mechanism for this effect is not known but it does not appear to be due to the photosensitising action of coal tar. In most regimens the coal tar is applied 2 hours before exposure to UVB light. In Ingram's regimen and its modifications the use of coal tar and UVB light is followed by topical treatment with dithranol. It has been suggested that the irritant effects of dithranol treatment can be reduced without loss of efficacy if coal tar is also used.

References.

1. Rotstein H, Baker C. The treatment of psoriasis. *Med J Aust* 1990; **152:** 153–64.
2. Arnold WP. Tar. *Clin Dermatol* 1997; **15:** 739–44.
3. Thami GP, Sarkar R. Coal tar: past, present and future. *Clin Exp Dermatol* 2002; **27:** 99–103.
4. British Association of Dermatologists. Psoriasis guideline 2006. Available at: http://www.bad.org.uk/healthcare/guidelines/psoriasis_guideline_(Final_update)_280906.pdf (accessed 27/09/07)

Preparations

BP 2008: Calamine and Coal Tar Ointment; Coal Tar and Salicylic Acid Ointment; Coal Tar and Zinc Ointment; Coal Tar Paste; Coal Tar Solution; Strong Coal Tar Solution; Zinc and Coal Tar Paste;
USP 31: Coal Tar Ointment; Coal Tar Topical Solution; Compound Resorcinol Ointment.

Proprietary Preparations (details are given in Part 3)
Arg.: Alcoderm; Alcontar†; Fijacid; Ingeshamp; Ionil-T Plus†; Soriacur†; Sorial; Supertar†; Sutrico Tar; Targel; ***Austral.:*** Alphosyl; Exorex†; Ionil-T Plus†; Linotar; Neutrogena T/Gel; Pinetarsol; Polytar Plus; Psorigel†;