- Interferons have antiviral, antiproliferative, and immunomodulatory actions and have thus been investigated in the management of warts; some studies, especially those involving intralesional administration, have showed benefit. Other routes of administration are under investigation; topical interferon alfa for anogenital warts, and an oral formulation for warts in the oral cavity of patients with HIV infection.
- Cidofovir is an antiviral that has activity against human papillomavirus. Investigational intravenous or topical use has been successful in a small number of patients with cutaneous or anogenital warts.
- Sinecatechins is a mixture of complex polyphenols extracted from green tea leaves. Although its mechanism of action is unclear, it is used in the treatment of external genital and perianal warts.

A quadrivalent recombinant human papillomavirus vaccine has recently been developed and is used to prevent anogenital warts, cervical cancer, and other pre-cancerous lesions caused by human papillomavirus types 6, 11, 16, and 18.

1. Sterling JC, *et al.* British Association of Dermatologists. Guidelines for the management of cutaneous warts. *Br J Dermatol* 2001; **144:** 4–11. Also available at: http://www.bad.org.uk/healthcare/guidelines/Cutaneous_Warts.pdf (accessed 26/09/07)
2. von Krogh G, *et al.* European Course on HPV Associated Pathology (ECHPV). European guideline for the management of anogenital warts. *Int J STD AIDS* 2001; **12** (suppl 3): 40–7. Also available at: http://www.iusti.org/sti-information/pdf/guidelines.pdf (accessed 26/09/07)
3. Micali G, *et al.* Management of cutaneous warts: an evidence-based approach. *Am J Clin Dermatol* 2004; **5:** 311–17.
4. Bellew SG, *et al.* Childhood warts: an update. *Cutis* 2004; **73:** 379–84.
5. Gibbs S, Harvey I. Topical treatments for cutaneous warts. Available in The Cochrane Database of Systematic Reviews; Issue 3. Chichester: John Wiley; 2006 (accessed 26/09/07).
6. CDC. Sexually transmitted diseases treatment guidelines, 2006. *MMWR* 2006; **55** (RR-11): 1–94. Correction. *ibid.*; 997. Also available at: http://www.cdc.gov/mmwr/PDF/rr/rr5511.pdf (accessed 26/09/07)

Wounds and ulcers

Wounds (physical injuries of the skin and underlying structures) may be the result of mechanical trauma, burns, or chemical injury. Ulcers are often the result of various underlying disorders. Among the commonest types, *decubitus ulcers* (bedsores, pressure sores) occur in patients with extended immobility when prolonged pressure on the skin over a bony prominence produces localised ischaemia. *Leg ulcers* may result from venous incompetence (venous ulcers) or be ischaemic in origin (arterial ulcers), while patients with peripheral neuropathy, such as diabetics or those with leprosy, may develop *neuropathic ulcers* due to repetitive inadvertent injury. Wounds or ulcers may be described as superficial, partial thickness, or full thickness. Superficial wounds are limited to epithelial tissue and heal rapidly by regeneration of epithelial cells. Partial thickness wounds involve the dermis and include some blood vessel damage, and therefore wound repair is a longer process. Full thickness wounds extend at least to subcutaneous fat, and healing requires synthesis of new connective tissue.

Healing mechanisms are essentially the same regardless of the cause of the damage:

- immediate haemostatic processes involve formation of a platelet plug and fibrin clot, as described under Haemostasis and Fibrinolysis, p.1045
- the early granulation and re-epithelialisation phase takes place up to about 21 days after injury depending on wound size and site. Platelet-derived growth factors stimulate fibroblasts to produce granulation tissue, comprising a collagen matrix well-supplied with capillary vessels, and growth of epidermal cells leading to re-epithelialisation of the wound surface
- during the final dermal repair and remodelling phase the collagen matrix undergoes strengthening and there is a reduction in vascularity. This phase can continue for up to 2 years after injury.

Several factors are important for efficient wound healing. Adequate supplies of nutrients, especially vitamin C and zinc (which are often given as supplements) and oxygen are needed. A good blood supply is thus essential. Clinical infection, either systemic or local, due to contamination by environmental microbes, causes tissue damage and delays healing. The process of wound repair requires many cellular and acellular factors, such as platelets and growth factors, and deficiencies in these may also be responsible for delayed healing. Thus, the patient's age, systemic conditions, concomitant drugs, nutritional status, and congenital deficiencies all influence the rate of healing.

Local **wound management** includes cleansing, removal of exudate, and prevention of microbial contamination. Choice of wound treatment preparation will depend on the size, location, type, and cause of the wound, on the presence of infection, and on the particular stage of healing.

Wound **cleansing** is required to remove any dirt or foreign bodies and to **remove exudate** and slough (pus and necrotic tissue). This helps to prevent infection and aids healing. Commonly used cleansing solutions are sodium chloride 0.9%, hypochlorite, hydrogen peroxide, povidone-iodine, and chlorhexidine. However, some antiseptics and hypochlorites might be associated with delayed wound healing, especially with prolonged use, as they delay collagen production and cause inflammation. Also, many antiseptics are inactivated by organic material. Sodium chloride solution may be all that is required for routine cleansing of non-infected wounds.

Many of the cleansing solutions also help to remove slough. Other wound management preparations more specifically directed at removing slough include dextranomer, hydrogels, hydrocolloids, and enzyme preparations such as a mixture of streptokinase and streptodornase. Dextranomer, hydrogels, and hydrocolloids cause debridement by their occlusive, rehydrating properties. Surgical debridement is a fast and efficient way of removing necrotic tissue. Larval therapy (the use of live sterile maggots of *Lucilia sericata*, the common greenbottle fly) has also been effective for debridement of infected or necrotic wounds, including diabetic foot ulceration.

Wounds may produce large volumes of exudate as a result of inflammatory reactions, especially during the first few days. Hydrocolloid and alginate preparations and foam dressings are effective moisture absorbers.

All wounds are colonised by bacteria to some extent and there is no evidence that this superficial **infection** affects healing. However, infection with *Pseudomonas aeruginosa* may delay healing and sulfadiazine silver is used especially in burns. Acetic acid has also been used. Infections are treated systemically if there are indications of clinical infection such as sudden pain, cellulitis, and increased discharge; systemic management of bacterial skin infections is described on p.194.

Wound **dressings** and packing preparations help to protect the wound and provide the correct environment for wound healing. Some also help by absorbing exudate. Superficial wounds usually only require a low-adherent dressing. Alginates may be used for exuding wounds. Traditional dry dressings such as cotton wool, gauze, and lint are not used for partial or full thickness cavity wounds since they shed fibres, adhere to the wound, and cause wound dehydration. Hydrogels, hydrocolloids, polysaccharides, cadexomer-iodine, alginates, and foam dressings are all effective cavity wound preparations. Hyaluronic acid is incorporated into some dressings to promote wound healing.

Activated charcoal is very effective at reducing offensive odours from **malodorous wounds**, as are sugar (sucrose) pastes. Sucrose may exert its antibacterial effect by competing for water present in the cells of bacteria. Metronidazole is active against anaerobic bacteria that are associated with the pungent smell and is used topically for deodorising malodorous tumours. Metronidazole is not generally used on wounds because of the risk of inducing resistance but it is sometimes used to deodorise malodorous venous leg ulcers or decubitus ulcers.

In addition to the use of wound preparations, there may be other measures that aid healing of specific wounds or ulcers. Some wounds may require skin grafting. Skin substitutes, and growth factors, such as becaplermin, molgramostim, trafermin, and urogastrone, are being used or developed for non-healing ulcers and wounds. Topical phenytoin has produced some encouraging results in promoting the healing of various types of ulcers. Measures that aid the return of fluid from the leg, such as flexing the ankles, elevation, and use of compression bandages are beneficial in **venous ulcers**. There is insufficient evidence to recommend one type of dressing in preference to another, including the use of hydrocolloid dressings instead of simple low adherent dressings. The bioflavonoids, given orally, may improve venous insufficiency and therefore also aid healing. Systemic drugs that improve the supply of oxygen to tissues, for example pentoxifylline, may be useful in ischaemic and venous ulcers. Topical and systemic ketanserin has been investigated in a few patients and may be beneficial in wounds and ulcers where there is impaired blood flow. Hyperbaric oxygen therapy has been tried in a range of chronic wounds; it might be useful in reducing amputation in patients with chronic diabetic foot ulcers. Vascular surgery may be necessary in the management of some ulcers caused by ischaemia or chronic venous insufficiency. In **decubitus ulcers**, relief of pressure is the most important measure in management. The management of **burns** and **chemical burns** is described on p.1578.

General references.

1. Douglas WS, Simpson NB. Guidelines for the management of chronic venous leg ulceration: report of a multidisciplinary workshop. *Br J Dermatol* 1995; **132:** 446–52.
2. Smith DM. Pressure ulcers in the nursing home. *Ann Intern Med* 1995; **123:** 433–42.
3. Grey JE, Harding KG. The chronic non-healing wound: how to make it better. *Hosp Med* 1998; **59:** 557–63.
4. Orlando PL. Pressure ulcer management in the geriatric patient. *Ann Pharmacother* 1998; **32:** 1221–7.
5. Singer AJ, Clark RAF. Cutaneous wound healing. *N Engl J Med* 1999; **341:** 738–46.
6. Morgan DA. Wound management products in the drug tariff. *Pharm J* 1999; **263:** 820–5.
7. London NJM, Donnelly R. ABC of arterial and venous disease: ulcerated lower limb. *BMJ* 2000; **320:** 1589–91.
8. Harding KG, *et al.* Healing chronic wounds. *BMJ* 2002; **324:** 160–3.
9. de Araujo T, *et al.* Managing the patient with venous ulcers. *Ann Intern Med* 2003; **138:** 326–34.
10. Anonymous. Leg ulcers. In: Buxton PK, ed. *ABC of Dermatology.* 4th ed. London: BMJ Publishing Group, 2003: 43–6.
11. European Pressure Ulcer Advisory Panel. Nutritional guidelines for pressure ulcer prevention and treatment (issued 16th November, 2003). Available at: http://www.epuap.org/guidelines/english_nutritional_guidelines.pdf (accessed 27/09/07)
12. Cannon BC, Cannon JP. Management of pressure ulcers. *Am J Health-Syst Pharm* 2004; **61:** 1895–1905.
13. Simon DA, *et al.* Management of venous leg ulcers. *BMJ* 2004; **328:** 1358–62.
14. Enoch S, *et al.* ABC of wound healing: non-surgical and drug treatments. *BMJ* 2006; **332:** 900–903.
15. Reddy M, *et al.* Preventing pressure ulcers: a systematic review. *JAMA* 2006; **296:** 974–84.
16. Vowden KR, Vowden P. Preventing venous ulcer recurrence: a review. *Int Wound J* 2006; **3:** 11–21.
17. Palfreyman S, *et al.* Dressings for venous leg ulcers: systematic review and meta-analysis. *BMJ* 2007; **335:** 244–8.

Abrasive Agents

Abrasivos.

Абразивные Вещества; Шлифовальные Средства

Aluminium Oxide

Aliuminio oksidas; Alumiinioksidi; Aluminii Oxidum; Aluminio, óxido de; Aluminiumoxid; Alumínium-oxid; Glinu tlenek.

Алюминия Оксид

Al_2O_3 = 102.0.

CAS — 1344-28-1.

ATC — D10AX04.

ATC Vet — QD10AX04.

Pharmacopoeias. *Eur.* (see p.vii) includes the hydrated form (see Aluminium Hydroxide, p.1706).

Pumice

Lapis Pumicis; Piedra pómez; Pierre Ponce Granulée; Pumex; Pumex Granulatus; Pumice Stone.

Пемза

CAS — 1332-09-8.

Pharmacopoeias. In *US*.

USP 31 (Pumice). Pumice is a substance of volcanic origin consisting chiefly of complex silicates of aluminium, potassium, and sodium. Odourless, very light, hard, rough, porous greyish masses or gritty, greyish powder. It is stable in air. Practically insoluble in water and not attacked by acids. Three grades of powdered pumice are recognised:

- superfine (=pumice flour)—not less than 97% passes through a No. 200 [US] sieve
- fine—not less than 95% passes through a No. 150 sieve and not more than 75% through a No. 200 sieve
- coarse—not less than 95% passes through a No. 60 sieve and not more than 5% through a No. 200 sieve

Profile

Abrasive agents such as fused synthetic aluminium oxide or powdered pumice have been used either as adjuncts in the treatment of acne (despite doubts about their value—see p.1577) or for the removal of hard skin. Pumice has also been used as a dental abrasive and as a filtering medium. Other agents used as abrasives for acne include polyethylene granules.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Abralux; Ionax Scrub; ***Austral.:*** Brasivol; Ionax Scrub†; ***Braz.:*** Ionax Scrub; ***Chile:*** Ionax Scrub; ***Fr.:*** Brasivol; Ionax Scrub; ***Hong Kong:*** Brasivol†; Ionax Scrub†; ***Irl.:*** Brasivol; Ionax Scrub†; ***Malaysia:*** Ionax Scrub;

Mex.: Betagranulos; ***S.Afr.:*** Brasivol; ***Singapore:*** Ionax Scrub; ***UK:*** Brasivol; ***USA:*** Ionax Scrub; ***Venez.:*** Betagranulos; Ionax Scrub.

Multi-ingredient: ***Canad.:*** Pernox; ***Indon.:*** Aludonna; ***Ital.:*** Gastrodue†; ***Malaysia:*** Belcid†; ***Mex.:*** Dermobras; Ionax Scrub; ***Philipp.:*** Ionax Scrub; ***S.Afr.:*** Pedimed; ***Switz.:*** Cliniderm; ***USA:*** Pernox; Zanfel; ***Venez.:*** Exfoliderm.

Acitretin *(BAN, USAN, rINN)*

Acitretina; Acitretinas; Acitrétine; Acitretinum; Asitretiini; Asitretin; Etretin; Ro-10-1670; Ro-10-1670/000. (*all-trans*)-9-(4-Methoxy-2,3,6-trimethylphenyl)-3,7-dimethyl-2,4,6,8-nonatetraenoic acid; (2*E*,4*E*,6*E*,8*E*)-9-(4-Methoxy-2,3,6-trimethylphenyl)-3,7-dimethylnona-2,4,6,8-tetraenoic acid.

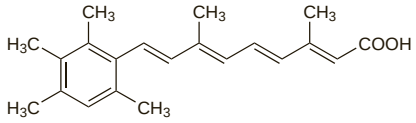
Ацитретин

$C_{21}H_{26}O_3$ = 326.4.

CAS — 55079-83-9.

ATC — D05BB02.

ATC Vet — QD05BB02.



Pharmacopoeias. In *Eur.* (see p.vii) and *US.*

Ph. Eur. 6.2 (Acitretin). A yellow or greenish-yellow, crystalline powder. Practically insoluble in water; slightly soluble in alcohol and in acetone; very slightly soluble in cyclohexane; sparingly soluble in tetrahydrofuran. It is sensitive to air, heat, and light, especially in solution. Store at 2° to 8° in airtight containers. Protect from light. It is recommended that the contents of an opened container be used as soon as possible and any unused part be protected by an atmosphere of inert gas.

USP 31 (Acitretin). A yellow or greenish, crystalline powder. Practically insoluble in water; slightly soluble in acetone and in alcohol; very slightly soluble in cyclohexane; sparingly soluble in tetrahydrofuran. Store in airtight containers at 20° to 25°, excursions permitted between 15° and 30°. Protect from light.

Adverse Effects and Precautions

As for Isotretinoin, p.1599.

Acitretin has a relatively short half-life, but etretinate, which has a very prolonged half-life, has been detected in the plasma of some patients receiving acitretin. Recommendations vary slightly in different countries but pregnancy should be avoided for at least 2 to 3 years after treatment has been withdrawn (see also Pregnancy, below) and patients should not donate blood for at least 1 to 3 years after stopping therapy. Female patients should avoid alcohol during treatment with acitretin and for 2 months after stopping treatment (see under Interactions, below).

Breast feeding. Acitretin was distributed into the breast milk of a woman treated with oral acitretin for psoriasis. Although the estimated amount of acitretin that would be consumed by a breast-fed infant was only 1.5% of the maternal dose, the authors considered that the toxic potential of acitretin to the infant justified its avoidance. In this case, the infant was not breast-fed during acitretin therapy.[1] Licensed product information also recommends that breast-feeding women should not be given acitretin. The American Academy of Pediatrics, however, has found no mention of clinical effect on the infant, and considers the maternal use of acitretin to be usually compatible with breast feeding.[2]

1. Rollman O, Pihl-Lundin I. Acitretin excretion into human breast milk. *Acta Derm Venereol (Stockh)* 1990; **70:** 487–90.
2. American Academy of Pediatrics. The transfer of drugs and other chemicals into human milk. *Pediatrics* 2001; **108:** 776–89. Correction. *ibid.*; 1029. Also available at: http://aappolicy.aappublications.org/cgi/content/full/pediatrics%3b108/3/776 (accessed 27/09/07)

Capillary leak syndrome. There are rare reports of capillary leak syndrome associated with acitretin. In one case, generalised oedema and weight gain, haemorrhagic lesions, and evidence of rhabdomyolysis were seen.[1] In another, there was oedema and weight gain, dyspnoea, pulmonary infiltrates, pleural effusion, hypotension, and oliguria.[2] These reactions may be related to the retinoic acid syndrome that can occur with tretinoin (see p.1618). Generalised oedema has also been reported with etretinate (p.1597).

1. Estival JL, *et al.* Capillary leak syndrome induced by acitretin. *Br J Dermatol* 2004; **150:** 150–2.
2. Vos LE, *et al.* Acitretin induces capillary leak syndrome in a patient with pustular psoriasis. *J Am Acad Dermatol* 2007; **56:** 339–42.

Effects on the blood. For reports of adverse effects on the blood by oral retinoids, including agranulocytosis associated with acitretin, see under Isotretinoin, p.1599.

Effects on the eyes. For reference to maculopathy occurring during therapy with acitretin, and the ocular effects of benign intracranial hypertension caused by retinoids, see under Isotretinoin, p.1600.

Effects on the musculoskeletal system. For reference to myopathy occurring during therapy with acitretin, and a discussion of hyperostosis and calcinosis that can occur with oral retinoid therapy, see under Isotretinoin, p.1600.

Effects on the skin. For mention of the exacerbation of erythroderma by acitretin, see under Isotretinoin, p.1601.

Pregnancy. The risks of spontaneous abortion and malformations similar to those associated with isotretinoin (p.1601) are high when acitretin or etretinate are given during pregnancy, particularly the first trimester.[1,2] Although the risks might be lower after stopping treatment, malformations have still been reported in infants and aborted fetuses conceived within 2 years of stopping acitretin[1,3] and up to 45 months after stopping etretinate.[1] In the UK licensed product information for acitretin recommends that pregnancy should be avoided during and for at least 2 years (3 years is recommended in the USA) after withdrawal of therapy because etretinate, which has a much longer half-life than acitretin, has been detected in the plasma of some patients given acitretin. It has been pointed out that plasma-etretinate concentrations are a poor indication of total body stores; a study[4] has indicated that there may be substantial concentrations of etretinate in the fatty tissues of women who have received acitretin.

For information on contraceptive choice in women taking oral retinoids, see under Isotretinoin, p.1601.

1. Geiger J-M, *et al.* Teratogenic risk with etretinate and acitretin treatment. *Dermatology* 1994; **189:** 109–16.
2. Barbero P, *et al.* Acitretin embryopathy: a case report. *Birth Defects Res A Clin Mol Teratol* 2004; **70:** 831–3.
3. Maradit H, Geiger J-M. Potential risk of birth defects after acitretin discontinuation. *Dermatology* 1999; **198:** 3–4.
4. Sturkenboom MCJM, *et al.* Inability to detect plasma etretinate and acitretin is a poor predictor of the absence of these teratogens in tissue after stopping acitretin treatment. *Br J Clin Pharmacol* 1994; **38:** 229–35.

Interactions

As for Isotretinoin, p.1602.

Etretinate has been detected in the plasma of some patients receiving acitretin and acitretin is also a metabolite of etretinate; therefore interactions associated with etretinate (see p.1597) may also apply to acitretin. Taking acitretin with alcohol has been associated with etretinate formation.

For discussion of the potential interactions of retinoids with hormonal contraceptives, and the effect this might have on contraceptive choice during retinoid treatment, see p.2068.

Alcohol. The consumption of alcohol has been associated with the formation of etretinate in patients taking acitretin.[1,2] One study[2] found a trend suggesting that a higher alcohol intake was associated with a higher risk of etretinate formation and higher etretinate concentrations. However, the presence of alcohol is not essential for this transformation to take place and etretinate has also been detected in a patient taking acitretin who did not drink alcohol.[3] Consequently, licensed product information warns that alcohol must not be consumed by female patients during acitretin therapy and for 2 months after stopping, to avoid the formation of etretinate and associated prolonged risks of teratogenicity (see Pregnancy, above).

1. Larsen FG, *et al.* Conversion of acitretin to etretinate in psoriatic patients is influenced by ethanol. *J Invest Dermatol* 1993; **100:** 623–7.
2. Larsen FG, *et al.* Acitretin is converted to etretinate only during concomitant alcohol intake. *Br J Dermatol* 2000; **143:** 1164–9.
3. Maier H, Hönigsmann H. Concentration of etretinate in plasma and subcutaneous fat after long-term acitretin. *Lancet* 1996; **348:** 1107.

Pharmacokinetics

Acitretin is absorbed from the gastrointestinal tract and peak plasma concentrations have been obtained 1 to 5 hours after oral doses. Bioavailability after a single dose is about 60 to 70%, but this can vary considerably; bioavailability may be increased by dosage with food. Acitretin is highly bound to plasma proteins. It is metabolised to 13-*cis*-acitretin. Etretinate (p.1597) has also been detected in the plasma of some patients after doses of acitretin. The elimination half-life of acitretin is about 2 days but account should always be taken of the fact that the half-life of etretinate is much longer, being about 120 days. Acitretin is excreted as metabolites in bile and urine, and is distributed into breast milk.

◊ General references.

1. Larsen FG, *et al.* Pharmacokinetics and therapeutic efficacy of retinoids in skin diseases. *Clin Pharmacokinet* 1992; **23:** 42–61.
2. Larsen FG. Pharmacokinetics of etretinate and acitretin with special reference to treatment of psoriasis. *Acta Derm Venereol (Stockh)* 1994; **190** (suppl): 1–33.
3. Wiegand UW, Chou RC. Pharmacokinetics of acitretin and etretinate. *J Am Acad Dermatol* 1998; **39** (suppl): S25–S33.

Renal impairment. The pharmacokinetics of acitretin are reported to be altered in patients with chronic renal failure but neither acitretin nor its 13-*cis* metabolite are removed by haemodialysis.[1]

1. Stuck AE, *et al.* Pharmacokinetics of acitretin and its 13-cis metabolite in patients on haemodialysis. *Br J Clin Pharmacol* 1989; **27:** 301–4.

Uses and Administration

Acitretin is a retinoid and is a metabolite of etretinate (p.1597). It is used orally in the treatment of severe psoriasis resistant to other forms of therapy, palmoplantar pustular psoriasis, severe congenital ichthyosis and Darier's disease (keratosis follicularis), and in severe lichen planus.

In the UK, acitretin is given in an initial daily dose of 25 or 30 mg with food for 2 to 4 weeks; in the USA (where it is licensed only for use in psoriasis) initial doses up to 50 mg daily are permitted. The daily dosage is adjusted thereafter according to clinical response and adverse effects; optimal results are usually obtained with 25 to 50 mg given daily for a further 6 to 8 weeks but some patients may require up to 75 mg daily. For the treatment of Darier's disease a starting dose of 10 mg may be appropriate, adjusted thereafter according to response. In Darier's disease and congenital ichthyosis treatment may be required for more than 3 months but a daily dosage of 50 mg should not be exceeded. In the UK, licensed product information recommends that continuous treatment should not last longer than 6 months for any indication because of limited clinical data. For lichen planus, doses are similar to those used in the UK (see above).

For doses in children, see below.

Administration in children. Acitretin is not generally considered suitable for use in children. However, a review of its use in 29 children with severe inherited disorders of keratinisation[1] reported that acitretin was an effective and safe treatment provided that the minimal effective dose was used and that adverse effects were carefully monitored. UK licensed product information contra-indicates acitretin use in children unless the benefits significantly outweigh the risks, particularly premature epiphyseal closure and other skeletal effects associated with retinoids. However, if deemed necessary an oral dose of 500 micrograms/kg once daily (occasionally up to 1 mg/kg daily for limited periods) has been suggested, but the maximum daily dose should not exceed 35 mg. The *BNFC* suggests that these doses may be used under expert supervision for children aged 1 month to 12 years for the treatment of severe extensive psoriasis resistant to other forms of therapy, palmo-plantar pustular psoriasis, severe congenital ichthyosis, and Darier's disease. The adult dose (see above) is considered suitable for children from 12 years of age. The *BNFC* also includes a dose of 500 micrograms/kg daily (occasionally up to 1 mg/kg daily) for the management of harlequin ichthyosis in neonates.

1. Lacour M, *et al.* An appraisal of acitretin therapy in children with inherited disorders of keratinization. *Br J Dermatol* 1996; **134:** 1023–9.

Eye disorders. A case report indicated that acitretin, given for psoriasis at an initial dose of 30 mg daily for one month and then reduced to 20 mg daily, improved corneal opacities in a patient with chronic tuberculosis-related interstitial keratitis.[1]

1. Labetoulle M, *et al.* Rapid improvement of chronic interstitial keratitis with acitretin. *Br J Ophthalmol* 2002; **86:** 1445–6.

Malignant neoplasms. Acitretin may be useful in preventing the development of skin neoplasms in high-risk individuals, such as solid organ transplant recipients.[1,2] However, long-term therapy is needed to maintain the effect and adverse effects can limit its use[2] (see also Malignant Neoplasms under Isotretinoin, p.1603). Gradual dose escalation may help to minimise mucocutaneous effects, and one proposed schedule for oral acitretin starts with 10 mg on alternate days for 2 weeks, 10 mg daily for the next 2 weeks, then 20 mg daily for a month; the dose is then adjusted as tolerated. Maintenance regimens of 25 mg daily, or alternating daily doses of 10 mg and 20 mg, have been used.[3]

1. Chen K, *et al.* Oral retinoids for the prevention of skin cancers in solid organ transplant recipients: a systematic review of randomized controlled trials. *Br J Dermatol* 2005; **152:** 518–23.
2. Kovach BT, *et al.* Systemic strategies for chemoprevention of skin cancers in transplant recipients. *Clin Transplant* 2005; **19:** 726–34.
3. Otley CC, *et al.* Chemoprevention of nonmelanoma skin cancer with systemic retinoids: practical dosing and management of adverse effects. *Dermatol Surg* 2006; **32:** 562–8.