Varicella-zoster vaccine may prevent or modify varicella if given within 3 days of exposure to the infection. It may be useful as an **adjunct** to varicella-zoster immunoglobulin. The treatment of varicella-zoster infections with antivirals is discussed on p.855.

One concern of varicella-zoster vaccination has been the possibility of an **increased risk of herpes zoster** (shingles) in immunised children. Although herpes zoster has been reported in vaccinated persons, a study involving 346 leukaemic children and 84 matched controls concluded that the incidence of herpes zoster following varicella-zoster vaccine was no greater than that following natural varicella infection.[10] The study did suggest that the risk of herpes zoster may be lowered by vaccination but this must be confirmed by long-term follow-up. Postmarketing surveys[11] of almost 90 000 vaccine recipients also showed a low incidence of herpes zoster. The vaccine strain of varicella-zoster virus is transmissible, particularly from vaccinees who develop a rash (see also Pregnancy under Adverse Effects, above). There is no evidence of reversion to virulence of the vaccine strain with secondary transmission.

Another concern is that vaccination of children could result in more severe infections in later life after immunity has waned. However, studies have shown that in general varicella is less severe in previously immunised than in non-immunised patients.[12,13]

The risk of zoster increases with age reflecting the waning of the specific cell-mediated immunity to the virus. Thus, the use of a high-potency varicella-zoster vaccine has been investigated in elderly subjects. In a randomised, double-blind, placebo-controlled study in over 38 000 subjects aged 60 or more the vaccine reduced the burden of illness due to herpes zoster by 61.1% and the incidence of herpes zoster and of postherpetic neuralgia by 51.3% and 66.5% respectively.[14] In the USA, high-potency varicella-zoster vaccine is recommended by the ACIP for all people 60 years of age and older, including those who have already had an episode of shingles.[15]

1. Kuter BJ, *et al.* Safety, tolerability, and immunogenicity of two regimens of Oka/Merck varicella vaccine (Varivax) in healthy adolescents and adults. *Vaccine* 1995; **13:** 967 72.
2. Gershon AA, *et al.* Persistence of immunity to varicella in children with leukemia immunized with live attenuated varicella vaccine. *N Engl J Med* 1989; **320:** 892–7.
3. Gershon AA, *et al.* Live attenuated varicella vaccine: protection in healthy adults compared with leukemic children. *J Infect Dis* 1990; **161:** 661–6.
4. Arbeter AM, *et al.* Immunization of children with acute lymphoblastic leukemia with live attenuated varicella vaccine without complete suspension of chemotherapy. *Pediatrics* 1990; **85:** 338–44.
5. Lopez AS, *et al.* One dose of varicella vaccine does not prevent school outbreaks: is it time for a second dose? *Pediatrics* 2006; **117:** 2253–4. Full version: http://pediatrics.aappublications.org/cgi/reprint/117/6/e1070 (accessed 06/07/07)
6. CDC. Prevention of varicella: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2007; **56** (RR-4): 1–40. Also available at: http://www.cdc.gov/mmwr/PDF/rr/rr5604.pdf (accessed 06/07/07)
7. Asano Y, *et al.* Experience and reason: twenty-year follow-up of protective immunity of the Oka strain live varicella vaccine. *Pediatrics* 1994; **94:** 524–6.
8. Chaves SS, *et al.* Loss of vaccine-induced immunity to varicella over time. *N Engl J Med* 2007; **356:** 1121–9.
9. Kuter B, *et al.* Ten year follow-up of healthy children who received one or two injections of varicella vaccine. *Pediatr Infect Dis J* 2004; **23:** 132–7.
10. Lawrence R, *et al.* The risk of zoster after varicella vaccination in children with leukemia. *N Engl J Med* 1988; **318:** 543–8.
11. Black S, *et al.* Postmarketing evaluation of the safety and effectiveness of varicella vaccine. *Pediatr Infect Dis J* 1999; **18:** 1041–6.
12. Watson BM, *et al.* Modified chickenpox in children immunized with the Oka/Merck varicella vaccine. *Pediatrics* 1993; **91:** 17–22.
13. Bernstein HH, *et al.* Clinical survey of natural varicella compared with breakthrough varicella after immunization with live attenuated Oka/Merck varicella vaccine. *Pediatrics* 1993; **92:** 833–7.
14. Oxman MN, *et al.* A vaccine to prevent herpes zoster and postherpetic neuralgia in older adults. *N Engl J Med* 2005; **352:** 2271–84.
15. CDC. CDC's Advisory Committee recommends "shingles" vaccination. Press release from the Advisory Committee on Immunization Practices (ACIP) (issued 26 October 2006). Available at: http://www.cdc.gov/od/oc/media/pressrel/r061026.htm (accessed 06/07/07)

Preparations

Ph. Eur.: Varicella Vaccine (Live).

Proprietary Preparations (details are given in Part 3)

Arg.: Varicela Biken; Varilrix; ***Austral.:*** Varilrix; Varivax; ***Austria:*** Varilrix; ***Belg.:*** Provarivax; Varilrix; ***Braz.:*** Vacina Contra A Varicela (Virus Atenuado); Vacina Contra Varicela; Varilrix†; Varivax†; ***Canad.:*** Varilrix; Varivax; ***Chile:*** Varicela Biken; Varilrix; ***Cz.:*** Varilrix; Zostavax; ***Denm.:*** Varilrix; ***Fin.:*** Varilrix; ***Fr.:*** Varilrix; Varivax; ***Ger.:*** Varilrix; Varivax; ***Gr.:*** Varilrix; Varivax; ***Hong Kong:*** Okavax; Varilrix; Varivax; ***Hung.:*** Varilrix; ***India:*** Varilrix; Varipox; ***Indon.:*** Okavax; Varilrix; ***Irl.:*** Varivax; ***Israel:*** Varilrix; ***Ital.:*** Varilrix; Varivax; ***Malaysia:*** Okavax; Varilrix; Varivax†; ***Mex.:*** Okavax; Varilrix; Varivax; ***Neth.:*** Provarivax; ***Norw.:*** Varilrix; ***NZ:*** Varilrix; Varivax; ***Philipp.:*** Okavax; V-Z Vax; Varilrix; ***Pol.:*** Varilrix; ***Port.:*** Varilrix; Varivax; Zostavax; ***S.Afr.:*** Varilrix; ***Singapore:*** Okavax; Varilrix; Varivax†; ***Spain:*** Varilrix; Varivax; ***Swed.:*** Varilrix; ***Switz.:*** Varilrix; Varivax; ***Thai.:*** Okavax; Varilrix; ***Turk.:*** Okavax; Varilrix; ***UK:*** Varilrix; Varivax; ***USA:*** Varivax; Zostavax; ***Venez.:*** Varilrix.

Yellow Fever Vaccines

Vacunas de la fiebre amarilla.

ATC — J07BL01.

Pharmacopoeias. Many pharmacopoeias, including *Eur.* (see p.vii) and *US*, have monographs.

Ph. Eur. 6.2 (Yellow Fever Vaccine (Live); Vaccinum Febris Flavae Vivum). A freeze-dried preparation of the 17D strain of yellow fever virus grown in fertilised hen eggs. It is reconstituted immediately before use. It should be stored at 2° to 8° and be protected from light.

The BP 2008 states that Yel(live) may be used on the label.

USP 31 (Yellow Fever Vaccine). A freeze-dried preparation of a selected attenuated strain of live yellow fever virus cultured in chick embryos. It is reconstituted, just prior to use, by the addition of sodium chloride containing no antimicrobial agent. It should be stored under nitrogen preferably below 0° but not above 5°.

Adverse Effects and Precautions

As for vaccines in general, p.2201.

Local and general reactions are not common after vaccination for yellow fever. Very rarely encephalitis has occurred, generally in infants under 9 months of age. Therefore, yellow fever vaccine is not usually given to infants under 9 months (but see Vaccine-associated Neurotropic Disease, below).

There is as yet limited data on the safety of yellow fever vaccine in HIV-positive individuals. In the UK, it is recommended that specialist advice should be sought regarding the use of yellow fever vaccine in such individuals. WHO advises that the vaccine should be given to HIV-positive individuals who are asymptomatic if the risk of infection is high.

Pregnancy. Although yellow fever vaccine has been given to women during pregnancy without producing adverse effects in the infants,[1] fetal infection has been reported.[2] US recommendations[3] therefore advise that the safety of yellow fever vaccination during pregnancy has not been established and the vaccine should only be given to pregnant women if travel to an endemic area is unavoidable and if an increased risk of exposure exists. Infants born to these women should be monitored closely for evidence of congenital infection or other adverse effects.

1. Nasidi A, *et al.* Yellow fever vaccination and pregnancy: a four-year prospective study. *Trans R Soc Trop Med Hyg* 1993; **87:** 337–9.
2. Tsai TF, *et al.* Congenital yellow fever virus infection after immunization in pregnancy. *J Infect Dis* 1993; **168:** 1520–3.
3. CDC. Yellow fever vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2002. *MMWR* 2002; **51** (RR-17): 1–11. Also available at: http://www.cdc.gov/mmwr/PDF/rr/rr5117.pdf (accessed 25/05/06)

Vaccine-associated neurotropic disease. Yellow fever vaccine has been associated with rare reports of encephalitis, now termed vaccine-associated neurotropic disease (YEL-AND). WHO has stated[1] that, since 1945, there have been at least 26 cases of proven or probable YEL-AND of which 16 occurred in infants aged less than 6 months. Of the 26 cases, 24 recovered without further complications and there were 2 fatalities.[1] Vaccine virus recovered from one of the fatalities, a 3-year-old child, revealed that mutation had occurred in the envelope gene of the virus, but it is not known whether similar mutations occurred in the other cases. The other fatality occurred in an immunocompromised adult with HIV infection. As a precaution against possible encephalitis, infants less than 9 months of age are not generally immunised, although it may be advisable to immunise at 6 to 8 months of age during epidemics.

1. WHO. Yellow fever vaccine: WHO position paper. *Wkly Epidem Rec* 2003; **78:** 349–59.

Vaccine-associated viscerotropic disease. Yellow fever vaccine has been associated with rare reports of multiple organ failure, now termed yellow fever vaccine-associated viscerotropic disease (YEL-AVD). WHO has stated[1] that, between 1996 and 2001, there were 7 recorded cases of YEL-AVD of which 2 occurred in Brazil,[2] 4 in the USA,[3] and one in Australia.[4] Six of these 7 cases were fatal. A further case, also leading to fatality, was reported to have occurred in Spain in 2004.[5] It has been suggested that the most likely explanation is an idiosyncratic host susceptibility to the 17D vaccine strain rather than a reversion of the vaccine strain to a wild-type strain.[5] There is also some evidence to suggest that the risk of YEL-AVD is greater in patients aged over 60 years.[6]

1. WHO. Yellow fever vaccine: WHO position paper. *Wkly Epidem Rec* 2003; **78:** 349–59.
2. Vasconcelos PFC, *et al.* Serious adverse events associated with yellow fever 17DD vaccine in Brazil: a report of two cases. *Lancet* 2001; **358:** 91–7. Corrections. *ibid.*; 336. *ibid.*; 1018.
3. Chan RC, *et al.* Hepatitis and death following vaccination with 17D-204 yellow fever vaccine. *Lancet* 2001; **358:** 121–2.
4. Martin M, *et al.* Fever and multisystem organ failure associated with 17D-204 yellow fever vaccination: a report of four cases. *Lancet* 2001; **358:** 98–104.
5. Agencia Española del Medicamentos y Productos Sanitarios. A death associated with yellow fever vaccination reported in Spain. Available at: http://www.eurosurveillance.org/ew/2004/041104.asp (accessed 25/08/05)
6. Khromava AY, *et al.* Yellow fever vaccine: an updated assessment of advanced age as a risk factor for serious adverse events. *Vaccine* 2005; **23:** 3265–63.

Interactions

As for vaccines in general, p.2202.

Uses and Administration

Yellow fever vaccines are used for active immunisation against yellow fever. Immunity is usually established within about 10 days of administration and persists for many years. Only one dose is required for immunisation and is given by deep subcutaneous injection; the dose (0.5 mL) is the volume containing at least 1000 mouse LD_{50} units.

In the UK, immunisation against yellow fever is recommended for laboratory workers handling infected material, for persons travelling through or living in areas of infection, and for travellers entering countries which require an International Certificate of Vaccination. The immunity produced may last for life although officially an International Certificate of Vaccination against yellow fever is valid only for 10 years starting 10 days after the primary immunisation and only if the vaccine used has been approved by WHO and given at a designated centre.

Vaccination under 9 months of age is not generally recommended (see Adverse Effects and Precautions, above).

◊ General references.

1. Barrett ADT. Yellow fever vaccines. *Biologicals* 1997; **25:** 17–25.

◊ Recommendations of the Advisory Committee on Immunization Practices for the prevention of yellow fever in the USA.[1]

1. CDC. Yellow fever vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP), 2002. *MMWR* 2002; **51** (RR-17): 1–11. Also available at: http://www.cdc.gov/mmwr/PDF/rr/rr5117.pdf (accessed 25/05/06)

Immunisation schedules. The 17D (Rockefeller) yellow fever vaccine is now the only yellow fever vaccine produced.[1,2] The quantity available in the world has been limited and its relatively short half-life does not permit the accumulation of large stocks. The demand for the vaccine is also somewhat irregular, being suddenly high during epidemics and low during inter-epidemic periods.

In Africa and in South America two different strategies for yellow fever immunisation have been followed.[1,2] Firstly, an emergency immunisation programme takes place once an outbreak has begun, in an attempt to limit the spread of infection by immunising all persons in the focus, regardless of their former immune status. One disadvantage is that immunity does not appear until 7 days after immunisation and deaths may be expected to occur in the interim period. Secondly, a routine mass immunisation programme for yellow fever is aimed at immunising in advance all populations considered to be at risk. Yellow fever vaccine is included in the WHO Expanded Programme on Immunization; there are obvious logistic advantages in giving it at the age of 9 months at the same time as measles vaccine. In rural areas of the endemic zone that are considered at high risk, the minimum age for routine immunisation may be lowered to 6 months (see Vaccine-associated Neurotropic Disease, above).

1. WHO. *Prevention and control of yellow fever in Africa*. Geneva: WHO, 1986.
2. WHO. Yellow fever vaccine: WHO position paper. *Wkly Epidem Rec* 2003; **78:** 349–60.

Immunisation for travellers. A guide entitled *International Travel and Health* is published annually by WHO. Information is provided concerning the countries in Africa and South America where yellow fever is endemic and also countries requiring a traveller to hold a valid vaccination certificate. For some further details, see p.2203.

Preparations

Ph. Eur.: Yellow Fever Vaccine (Live);
USP 31: Yellow Fever Vaccine.

Proprietary Preparations (details are given in Part 3)

Arg.: Stamaril; ***Austral.:*** Stamaril; ***Belg.:*** Stamaril; ***Canad.:*** YF-Vax; ***Chile:*** Stamaril; ***Cz.:*** Stamaril; ***Denm.:*** Stamaril; ***Fin.:*** Arilvax†; Stamaril; ***Fr.:*** Stamaril; ***Ger.:*** Stamaril; ***Irl.:*** Arilvax†; Stamaril; ***Israel:*** Arilvax; ***Ital.:*** Stamaril; ***Malaysia:*** Stamaril†; ***Neth.:*** Arilvax; Stamaril; ***Norw.:*** Stamaril; ***NZ:*** Stamaril; ***Pol.:*** Stamaril; ***Port.:*** Stamaril; ***S.Afr.:*** Arilvax; Stamaril; ***Singapore:*** Arilvax†; Stamaril; ***Swed.:*** Arilvax†; Stamaril; ***Switz.:*** Arilvax†; Stamaril; ***Turk.:*** Stamaril; ***UK:*** Arilvax; Stamaril; ***USA:*** YF-Vax; ***Venez.:*** Stamaril†.

Supplementary Drugs and Other Substances

This chapter includes some drugs not easily classified, herbal medicines, new drugs whose place in therapy is not yet clear, and drugs no longer used clinically but still of interest. There are also monographs on toxic substances, the effects of which may require drug therapy.

Abrus

Abrus Seed; Indian Liquorice; Jequirity Bean; Jumble Beads; Prayer Beads; Regaliz americano; Rosary Beans.

Profile

Abrus consists of the seeds of *Abrus precatorius* (Leguminosae), one of whose constituents is abrin. Abrin, which is closely related to ricin, is considered responsible for the toxic effects of the seeds. Children have died from eating one or more seeds. Toxicity may be less likely to occur if the seeds are swallowed whole, than if they are chewed, because of the hard seed coat. Toxic effects may occur within a few hours or may be delayed for several days after ingestion. Signs and symptoms of abrin poisoning are similar to those described for ricin, p.2379.

Abrus has been used as an oral contraceptive in herbal medicine.

Homoeopathy. Abrus has been used in homoeopathic medicines.

◊ References.

1. Aslam M, Shaw JMH. Abrus in Asian medicine. *Pharm J* 1998; **261:** 822–4.
2. Fernando C. Poisoning due to Abrus precatorius (jequirity bean). *Anaesthesia* 2001; **56:** 1178–80.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Indon.:*** Enkasari; Ika Sariawan.

Absinthium

Absinthe; Absinthii herba; Ajenjo; Assenzio; Fehér ürömfű; Karčiųjų kiečių žolė; Losna; Mali, Koiruoho; Malört; Pelin; Pelyňková nať; Wermutkraut; Wormwood; Ziele piołunu.

CAS — 546-80-5 (α-thujone); 471-15-8 (β-thujone).

NOTE. The following terms have been used as 'street names' (see p.vi) or slang names for various forms of absinthium:
Green Fairy; Green Goddess; La Fée Verte.

Pharmacopoeias. In *Eur.* (see p.vii).
Ph. Eur. 6.2 (Wormwood). The leaves or flowering tops, or a mixture of these dried, whole or cut organs of wormwood, *Artemisia absinthium*. It contains not less than 2 mL/kg of essential oil, calculated with reference to the dried drug. Protect from light.

Profile

Absinthium has been used as a bitter. It is also used in small quantities as a flavour in alcoholic beverages, although it is considered in some countries to be unsafe for use in foods, beverages, or drugs. Habitual use or large doses cause absinthism, which is characterised by restlessness, vomiting, vertigo, tremors, and convulsions. Thujone, related to camphor, is the major constituent of the essential oil derived from absinthium.

Homoeopathy. Absinthium has been used in homoeopathic medicines under the following names: Artemisia absinthium; Artemisia absinthium ex herba siccata; Absinth.

◊ References.

1. Weisbord SD, *et al*. Poison on line—acute renal failure caused by oil of wormwood purchased through the Internet. *N Engl J Med* 1997; **337:** 825–7.
2. Skyles AJ, Sweet BV. Wormwood. *Am J Health-Syst Pharm* 2004; **61:** 239–42.

Preparations

Proprietary Preparations (details are given in Part 3)

Cz.: Nat Pelynku Praveho.

Multi-ingredient: ***Austria:*** Abdomilon N; Eryval; Magentee St Severin; Mariazeller; Sigman-Haustropfen; Virgilocard; ***Braz.:*** Camomila; ***Cz.:*** Abdomilon†; Contraspan†; Eugastrin†; Original Schwedenbitter; Zaludecni Cajova Smes; ***Fr.:*** Tisane Hepatique de Hoerdt; ***Ger.:*** Abdomilon N; Amara-Pascoe; Amara-Tropfen; Anore X N†; Aristochol N†; Floradix Multipretten N; Gallemolan forte; Gallemolan G†; Gallexier; Gastralon N†; Gastritol; Gastrol S†; Hepaticum novo†; Leber-Galle-Tropfen 83†; Lomatol†; Majocarmin forte†; Majocarmin mite†; Marianon†; Nervosana†; Neurochol C†; Pascopankreat; Presselin Blahungs K 4 N†; Presselin Dyspeptikum†; rohasal†; Stomachysat N†; Stovalid N†; Stullmaton†; Unex Amarum†; ventriloges N; ***India:*** Toniazol†; ***Ital.:*** Assenzio (Specie Composta)†; Genziana (Specie Composta)†; ***Pol.:*** Artemisol; Krople Zoladkowe; ***Rus.:*** Maraslavin (Мараславин); Original Grosser Bittner Balsam (Оригинальный Большой Бальзам Биттнера); ***S.Afr.:*** Amara; ***Switz.:*** Baume†; Kernosan Heidelberger Poudre; Phytomed Hepato†; Pommade au Baume.

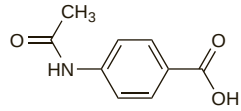
Acedoben *(pINN)*

Acedobén; Acédobène; Acedobenum. *p*-Acetamidobenzoic acid.

Ацедобен

$C_9H_9NO_3$ = 179.2.

CAS — 556-08-1.



Profile

Acedoben is a component of inosine pranobex (p.884), and has been given orally as the potassium salt in the treatment of skin disorders. Acedoben and its sodium salt have been applied topically.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Spain:*** Amplidermis; Hongosan.

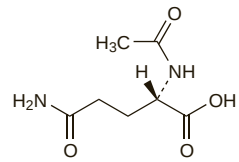
Aceglutamide *(rINN)*

Aceglutamida; Acéglutamide; Aceglutamidum. N^2-Acetyl-L-glutamine; 2-Acetylamino-L-glutaramic acid.

Ацеглутамид

$C_7H_{12}N_2O_4$ = 188.2.

CAS — 2490-97-3.



Profile

Aceglutamide has been given in an attempt to improve memory and concentration. Aceglutamide aluminium (p.1704) is used as an antacid.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Ital.:*** Acutil Fosforo; Memovisus†; Tonoplus†.

Acemannan *(USAN, rINN)*

Acemanán; Acémannan; Acemannanum; Polymanoacetate.

Ацеманнан

CAS — 110042-95-0.

Profile

Acemannan is a highly acetylated, polydispersed, linear mannan obtained from the mucilage of *Aloe vera* (*A. barbadensis*). It has immunomodulating properties and is an ingredient of topical wound dressing products including those formulated for the oral mucosa.

Preparations

Proprietary Preparations (details are given in Part 3)

USA: Carrasyn; DiaB Gel; Oral Wound Rinse; RadiaGel; SaliCept; Ultrex.

Acetic Acid

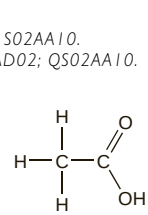
Acide acétique; Ácido acético; Ácido etanóico; Acidum aceticum; Acto rūgštis; Asetik Asit; Ättiksyra; E260; Ecetsav; Eisessig (glacial acetic acid); Essigsäure; Etanoico; Ethanoic Acid; Etikkahappo; Kwas octowy; Kyselina octová.

$C_2H_4O_2$ = 60.05.

CAS — 64-19-7.

ATC — G01AD02; S02AA10.

ATC Vet — QG01AD02; QS02AA10.



NOTE. The nomenclature of acetic acid often leads to confusion over whether concentrations are expressed as percentages of glacial acetic acid ($C_2H_4O_2$) or of a diluted form. In *Martindale*, the percentage figures given against acetic acid represent the amount of $C_2H_4O_2$.

Pharmacopoeias. Glacial acetic acid is included in *Chin.*, *Eur.* (see p.vii), *Int.*, *Jpn*, and *US*.
Solutions containing about 30 to 37% are included in *Br.* (33%), *Chin.* (36 to 37%), *Int.*, *Jpn* (30 to 32%), and *Swiss* (30%). Also in *USNF* (36 to 37%).
Dilute acetic acid (6%) is included in *Br.* and *Int.* Also in *USNF*.
Ph. Eur. 6.2 (Acetic Acid, Glacial; Acidum Aceticum Glaciale). A crystalline mass or a clear colourless volatile liquid. F.p. not lower than 14.8°. Miscible with water, with alcohol, and with dichloromethane. Store in airtight containers.
BP 2008 (Acetic Acid (33 per cent)). It contains 32.5 to 33.5% w/w of $C_2H_4O_2$. It is a clear colourless liquid with a pungent odour. Miscible with water, with alcohol, and with glycerol.
BP 2008 (Acetic Acid (6 per cent)). It contains 5.7 to 6.3% w/w of $C_2H_4O_2$. It is prepared by diluting Acetic Acid (33 per cent).
USP 31 (Glacial Acetic Acid). A clear colourless liquid with a pungent characteristic odour. B.p. about 118°. Miscible with water, with alcohol, and with glycerol. Store in airtight containers.
USNF 26 (Acetic Acid). It contains 36 to 37% w/v of $C_2H_4O_2$. It is a clear colourless liquid with a strong characteristic odour. Miscible with water, with alcohol, and with glycerol. Store in airtight containers.
USNF 26 (Diluted Acetic Acid). It contains 5.7 to 6.3% w/v of $C_2H_4O_2$. It is prepared by diluting Acetic Acid. Store in airtight containers.

Adverse Effects and Treatment

Local or topical application of acetic acid preparations may produce stinging or burning. Ingestion of glacial acetic acid can produce similar adverse effects to those of hydrochloric acid (p.2322), which may be treated similarly.

Uses and Administration

Glacial acetic acid has been used as an escharotic. Diluted forms have been used as an antibacterial (it is reported to be effective against *Haemophilus* and *Pseudomonas* spp.), antifungal, and antiprotozoal in vaginal gels and douches, irrigations, topical preparations for the skin and nails, and in ear drops. Diluted forms have also been used as an expectorant, an astringent lotion, and as treatments for warts (p.1584), callosities, and for certain jellyfish stings (see below). Solutions have also been used to soften ear wax (p.1725) and in the treatment of otitis externa (p.182). Visual inspection of the uterine cervix with acetic acid (VIA) is being investigated as a screening method for cervical cancer, particularly where facilities for cytological methods may be limited.

A solution containing 4% w/v $C_2H_4O_2$ is known as artificial vinegar or non-brewed condiment. Vinegar is a product of fermentation.

Jellyfish sting. Vinegar or acetic acid 3 to 10% is applied to box jellyfish stings to inactivate any fragments of adherent tentacle[1,2] (see p.2220). Acetic acid solutions have been reported to be useful in stings by related species[3] although they may produce further discharge of venom in some jellyfish.[4]

1. Hartwick RJ, *et al*. Disarming the box jellyfish. *Med J Aust* 1980; **1:** 15–20.
2. Fenner PJ, Williamson JA. Worldwide deaths and severe envenomation from jellyfish stings. *Med J Aust* 1996; **165:** 658–61.
3. Fenner PJ, *et al*. "Morbakka", another cubomedusan. *Med J Aust* 1985; **143:** 550–5.
4. Fenner PJ, Fitzpatrick PF. Experiments with the nematocysts of Cyanea capillata. *Med J Aust* 1986; **145:** 174.

Wounds and burns. Infection of wounds (p.1585) and burns (p.1578) with *Pseudomonas aeruginosa* may delay healing. Acetic acid has been used, in concentrations of up to 5%, to eradicate these infections.[1]

1. Milner SM. Acetic acid to treat Pseudomonas aeruginosa in superficial wounds and burns. *Lancet* 1992; **340:** 61.

Preparations

BP 2008: Strong Ammonium Acetate Solution;
USP 31: Acetic Acid Irrigation; Acetic Acid Otic Solution; Hydrocortisone and Acetic Acid Otic Solution.

Proprietary Preparations (details are given in Part 3)

Arg.: Ecoshampoo†; Hexa-Defital Crema Enjuague; Otopreven; Pelo Libre Protectora; Pil-G Uso†; ***Austral.:*** Summers Eve Disposable; ***Chile:*** Soft Kilnits†; ***Fr.:*** Para Lentes; ***Gr.:*** Instaret; ***Irl.:*** Aci-Jel†; ***UK:*** Aci-Jel†; EarCalm; Meltus Baby; ***USA:*** Feminique; Massengill Disposable; Summers Eve Disposable; ***Venez.:*** Duvagin; Fem Ducha.

Multi-ingredient: ***Arg.:*** Aglio; Callicida; Detebencil Nit; Fuera Bicho; Hexa-Defital Plus; Microsona Otica; Uze Active; Yalu†; ***Austral.:*** Aci-Jel†; Aqua Ear; Ear Clear for Swimmer's Ear; ***Belg.:*** Aporil; ***Braz.:*** A Curitybina; Kalostop†; Lacto Vagin†; ***Canad.:*** SH-206; Viron Wart Lotion; VoSoL HC†; ***Chile:*** Summer's Eve Vinagre y Agua†; ***Cz.:*** Solcogyn†; ***Fr.:*** Nitrol; Ysol 206; ***Ger.:*** Gehwol Huhneraugen-Tinktur; Solco-Derman; ***Gr.:*** Otocort; ***Hong Kong:*** Baby Cough with Antihistamine; Solcoderm; ***India:*** Otek-AC†; Perfocyn†; ***Irl.:*** Phytex; ***Ital.:*** Oleo Calcarea†; ***Malaysia:*** Solcoderm†; ***Neth.:*** Buckleys Kinderhoestsiroop; ***NZ:*** Aci-Jel†; Aqua Ear†; VoSoL; ***Pol.:*** Acifungin; Solcogyn; ***Rus.:*** Bubil (Бубил); Solcoderm (Солкодерм); Solcovagin (Солковагин); ***Spain:*** Callicida Cor Pik; Callicida Rojo; Keranin; Nitroina; Quocin; ***Switz.:*** Coruzol†; Solcoderm; Solcogyn; Waruzol; ***Thai.:*** Baby Cough Syrup Atlantic; Baby Cough with Antihistamine; ***Turk.:*** Dilan; Tuba;