immunogenicity of Shiga toxin produced by the organism. While vaccination against EPEC has to be directed towards susceptible human populations, there are two possible approaches with regard to EHEC, namely vaccination of either humans or the animal reservoir, cattle. Studies of vaccine candidates are ongoing *in vitro*, in *animal* models, and in healthy subjects. For both pathogens, however, the development of vaccines would not in itself serve to eradicate the spread of infections and would need to be accompanied by public health campaigns to increase food hygiene and monitoring of water supplies and facilities.[1]

Enterotoxigenic *E. coli* (ETEC) is a major cause of travellers' diarrhoea. A phase II placebo-controlled study[2] found that a vaccine containing heat-labile enterotoxin from ETEC given as a skin patch (2 patches applied 2 to 3 weeks apart), reduced the risk of moderate to severe travellers' diarrhoea by 75% and severe diarrhoea by 84%. In vaccinated travellers who got diarrhoea, the illness was significantly shorter and milder.

Further references.[3-7]

1. Horne C, *et al.* Current progress in enteropathogenic and enterohemorrhagic Escherichia coli vaccines. *Expert Rev Vaccines* 2002; **1:** 483–93.
2. Frech SA, *et al.* Use of a patch containing heat-labile toxin from Escherichia coli against travellers' diarrhoea: a phase II, randomised, double-blind, placebo-controlled field trial. *Lancet* 2008; **371:** 2019–25.
3. Boedeker EC. Vaccines for enterotoxigenic Escherichia coli: current status. *Curr Opin Gastroenterol* 2005; **21:** 15–9.
4. Steffen R, *et al.* Vaccination against enterotoxigenic Escherichia coli, a cause of travelers' diarrhea. *J Travel Med* 2005; **12:** 102–7.
5. Walker RI, *et al.* Ad Hoc ETEC Technical Expert Committee. Analysis of strategies to successfully vaccinate infants in developing countries against enterotoxigenic E. coli (ETEC) disease. *Vaccine* 2007; **25:** 2545–66.
6. Goldwater PN. Treatment and prevention of enterohemorrhagic Escherichia coli infection and hemolytic uremic syndrome. *Expert Rev Anti Infect Ther* 2007; **5:** 653–63.
7. Serna A, Boedeker EC. Pathogenesis and treatment of Shiga toxin-producing Escherichia coli infections. *Curr Opin Gastroenterol* 2008; **24:** 38–47.

Gas-gangrene Antitoxins

Antitoxinas de la gangrena gaseosa.

ATC — J06AA05.

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

Ph. Eur. 6.2 (Gas-gangrene Antitoxin (Novyi); Immunoserum Gangraenicum (Clostridium Novyi)). A sterile preparation containing the specific antitoxic globulins that have the power of neutralising the alpha toxin formed by *Clostridium novyi*. It has a potency of not less than 3750 international units/mL. It should be stored at 2° to 8°, and not be allowed to freeze.

The BP 2008 states that Nov/Ser may be used on the label.

The BP 2008 gives Gas-gangrene Antitoxin (Oedematiens) as an approved synonym.

Ph. Eur. 6.2 (Gas-gangrene Antitoxin (Perfringens); Immunoserum Gangraenicum (Clostridium Perfringens)). A sterile preparation containing the specific antitoxic globulins that have the power of neutralising the alpha toxin formed by *Clostridium perfringens*. It has a potency of not less than 1500 international units/mL. It should be stored at 2° to 8°, and not be allowed to freeze.

The BP 2008 states that Perf/Ser may be used on the label.

Ph. Eur. 6.2 (Gas-gangrene Antitoxin (Septicum); Immunoserum Gangraenicum (Clostridium Septicum)). A sterile preparation containing the specific antitoxic globulins that have the power of neutralising the alpha toxin formed by *Clostridium septicum*. It has a potency of not less than 1500 international units/mL. It should be stored at 2° to 8°, and not be allowed to freeze.

The BP 2008 states that Sep/Ser may be used on the label.

Ph. Eur. 6.2 (Gas-gangrene Antitoxin, Mixed; Immunoserum Gangraenicum Mixtum). It is prepared by mixing Gas-gangrene Antitoxin (Novyi), Gas-gangrene Antitoxin (Perfringens), and Gas-gangrene Antitoxin (Septicum) in appropriate quantities. It has a potency of not less than 1000 international units/mL of Gas-gangrene Antitoxin (Novyi), not less than 1000 international units/mL of Gas-gangrene Antitoxin (Perfringens), and not less than 500 international units/mL of Gas-gangrene Antitoxin (Septicum). It should be stored at 2° to 8°, and not be allowed to freeze.

The BP 2008 states that Gas/Ser may be used on the label.

Profile

Gas-gangrene antitoxins have been used for the treatment of gas gangrene and for prophylaxis in patients at risk after injury. They are now seldom used and have been superseded by antibacterials. Monovalent gas-gangrene antitoxins have been little used in practice owing to the difficulty of rapidly identifying the infecting organism.

Preparations

Ph. Eur.: Gas-gangrene Antitoxin (Novyi); Gas-gangrene Antitoxin (Perfringens); Gas-gangrene Antitoxin (Septicum); Mixed Gas-gangrene Antitoxin.

Proprietary Preparations (details are given in Part 3)

Cz.: Gasea†.

Gonococcal Vaccines

Gonorrhoea Vaccines; Vacunas de la gonorrea.

Profile

Several experimental gonococcal vaccines, produced usually from the surface antigens of *Neisseria gonorrhoeae*, have been investigated.

Haemophilus Influenzae Vaccines

Vacunas de Haemophilus influenzae.

ATC — J07AG01 (B, purified antig. conjugate).

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

Ph. Eur. 6.2 (Haemophilus type b Conjugate Vaccine; Vaccinum Haemophili Stirpe B Conjugatum). A liquid or freeze-dried preparation of a polysaccharide, polyribosylribitol phosphate (PRP), derived from a suitable strain of *Haemophilus influenzae* type b, covalently bound to a carrier protein. The carrier protein, when conjugated to PRP, is capable of inducing a T-cell-dependent B-cell immune response to the polysaccharide. Carrier proteins currently approved are diphtheria toxoid, tetanus toxoid, CRM 197 diphtheria protein, and meningococcal group B outer membrane protein (OMP). It should be stored at 2° to 8° and protected from light.

The BP 2008 states that Hib may be used on the label.

Adverse Effects and Precautions

As for vaccines in general, p.2201.

Erythema multiforme and transient cyanosis of the lower limbs have been reported rarely in children receiving haemophilus influenzae-containing vaccines.

Effects on the nervous system. Guillain-Barré syndrome has been reported[1] after vaccination with haemophilus influenzae conjugate vaccines in a small number of infants. In one report, onset of symptoms occurred within 1 week of vaccination of 3 infants with an haemophilus influenzae conjugate vaccine (diphtheria toxoid conjugate). However, a causal relationship has not yet been established.

1. D'Cruz OF, *et al.* Acute inflammatory demyelinating polyradiculoneuropathy (Guillain-Barré syndrome) after immunization with Haemophilus influenzae type b conjugate vaccine. *J Pediatr* 1989; **115:** 743–6.

Interactions

As for vaccines in general, p.2202.

Antineoplastics. Haemophilus influenzae infection occurred in a child who had received antineoplastic therapy despite having completed a primary course of immunisation before the neoplasia was diagnosed.[1] A subsequent booster dose produced an adequate antibody response. Antineoplastic therapy may have impaired the T-cell response to infection.

1. Jenkins DR, *et al.* Childhood neoplasia and Haemophilus influenzae type b vaccine failure. *Lancet* 1996; **348:** 131.

Diphtheria, tetanus, and pertussis vaccines. Some haemophilus influenzae conjugated vaccines may be mixed with diphtheria, tetanus, and pertussis vaccines before administration without adversely affecting the immunogenicity of the components[1,2] although there has also been a report of reduced immunogenicity.[3] Manufacturers may provide further information on compatibility.

1. Miller MA, *et al.* Safety and immunogenicity of PRP-T combined with DTP: excretion of capsular polysaccharide and antibody response in the immediate post-vaccination period. *Pediatrics* 1995; **95:** 522–7.
2. Mulholland EK, *et al.* The use of Haemophilus influenzae type b-tetanus toxoid conjugate vaccine mixed with diphtheria-tetanus-pertussis vaccine in Gambian infants. *Vaccine* 1996; **14:** 905–9.
3. Eskola J, *et al.* Randomised trial of the effect of co-administration with acellular pertussis DTP vaccine on immunogenicity of Haemophilus influenzae type b conjugated vaccine. *Lancet* 1996; **348:** 1688–92.

Uses and Administration

Haemophilus influenzae (Hib) vaccines are used for active immunisation against *Haemophilus influenzae* type b infections. Vaccines are prepared from the capsular polysaccharide of *H. influenzae* type b and immunogenicity, especially in young children, is improved by linking the polysaccharide to a protein carrier to form a conjugate vaccine.

Different proprietary vaccines may be conjugated to differing proteins but are generally regarded as interchangeable.

Haemophilus Influenzae Conjugate Vaccine (Diphtheria Toxoid Conjugate) (PRP-D) consists of the purified capsular polysaccharide of *Haemophilus influenzae* type b covalently linked to diphtheria toxoid.

Haemophilus Influenzae Conjugate Vaccine (Diphtheria CRM_{197} Protein Conjugate) (HbOC) consists of oligosaccharides derived from the purified capsular polysaccharide of *Haemophilus influenzae* type b covalently linked to a non-toxic variant of diphtheria toxin isolated from *Corynebacterium diphtheriae*.

Haemophilus Influenzae Conjugate Vaccine (Meningococcal Protein Conjugate) (PRP-OMP or PRP-OMPC) consists of the purified capsular polysaccharide of *Haemophilus influenzae* type b covalently linked to an outer membrane protein complex of *Neisseria meningitidis* group B.

Haemophilus Influenzae Conjugate Vaccine (Tetanus Toxoid Conjugate) (PRP-T) consists of the purified capsular polysaccharide of *Haemophilus influenzae* type b covalently linked to tetanus toxoid.

For primary immunisation either combined vaccines or single-component Haemophilus influenzae vaccines may be used.

In the UK, a combined diphtheria, tetanus, pertussis (acellular component), poliomyelitis (inactivated), and Haemophilus influenzae vaccine (p.2212) is used. Children over 1 year of age and under 10 years of age who have not been immunised against *Haemophilus influenza* or have not completed a primary vaccination course of diphtheria, tetanus, pertussis, or polio, should be given 3 doses of a combined diphtheria, tetanus, pertussis (acellular component), poliomyelitis (inactivated), and *Haemophilus influenzae* vaccine. Those who have completed a primary vaccination course of diphtheria, tetanus, pertussis, and polio, should receive a single dose of a combined *Haemophilus influenzae* and meningococcal C conjugate vaccine. Routine use in children older than 10 years or adults is not recommended in the UK, but asplenic children (over 10 years of age) and adults who have not been previously immunised should receive two doses of combined *Haemophilus influenzae* and meningococcal C conjugate vaccine, two months apart.

In the USA, primary immunisation is also carried out in conjunction with diphtheria, tetanus, and pertussis vaccination. If a meningococcal protein conjugate vaccine is used, only 2 doses are given for the primary course. A reinforcing dose using any of the available vaccines is given at 12 to 15 months of age.

Where compatibility has been shown, Hib vaccines may be mixed immediately before use with diphtheria, tetanus, and pertussis vaccines (but see Interactions, above).

Preparations

Ph. Eur.: Haemophilus Type b Conjugate Vaccine.

Proprietary Preparations (details are given in Part 3)

Arg.: PedvaxHIB†; ***Austral.:*** Hiberix; HibTITER†; PedvaxHIB; ***Austria:*** Act-HIB; HibTITER; ***Belg.:*** Act-HIB; Hiberix†; HibTITER†; ***Braz.:*** Act-HIB†; Hiberix†; PedvaxHIB; Vacina Conj Com Proteina Tetanica Contra Haemophilus influenzae Tipo B; Vacina Conj Contra Haemophilus Influenzae Tipo B; ***Canad.:*** Act-HIB; PedvaxHIB; ***Chile:*** Act-HIB; ***Cz.:*** Act-HIB; Hiberix; HibTITER†; ***Denm.:*** Act-HIB; HibTITER†; ***Fin.:*** Hiberix†; HibTITER†; ***Fr.:*** Act-HIB; ***Ger.:*** Act-HIB†; HibTITER†; PedvaxHIB†; ***Gr.:*** Act-HIB; Hiberix; HibTITER†; ***Hong Kong:*** Act-HIB; Hiberix; PedvaxHIB; ***Hung.:*** Act-HIB; ***India:*** Hiberix; Vaxim HIB; ***Indon.:*** Act-HIB; Hiberix; PedvaxHIB; ***Irl.:*** Act-HIB; Hiberix; HibTITER†; ***Israel:*** Act-HIB; HibTITER†; PedvaxHIB†; ***Ital.:*** Act-HIB; Hiberix; HibTITER†; Vaxem Hib; ***Malaysia:*** Act-HIB†; Hiberix; PedvaxHIB†; ***Mex.:*** HibTITER†; PedvaxHIB; Vaxem Hib†; ***Neth.:*** Act-HIB; Hiberix; ***Norw.:*** Act-HIB; ***NZ:*** Hiberix; HibTITER†; ***Philipp.:*** Act-HIB; Hiberix; Vaxem Hib; ***Pol.:*** Act-HIB; Hiberix; HibTITER; PedvaxHIB; ***Port.:*** Hiberix; HibTITER†; ***Rus.:*** Hiberix (Хиберикс); ***S.Afr.:*** Act-HIB; Hiberix; ***Singapore:*** Act-HIB; Hiberix; PedvaxHIB†; ***Spain:*** Act-HIB; Hiberix; HibTITER; ***Swed.:*** Act-HIB; HibTITER†; ***Switz.:*** Hiberix; ***Thai.:*** Act-HIB; Hiberix; PedvaxHIB; Vaxem Hib; ***Turk.:*** Act-HIB; Hiberix; PedvaxHIB; ***UK:*** Act-HIB†; Hiberix; ***USA:*** Act-HIB; HibTITER; OmniHIB; PedvaxHIB; ProHIBiT†; ***Venez.:*** Act-HIB†; Hiberix.

Haemophilus Influenzae and Hepatitis B Vaccines

Vacunas de Haemophilus influenzae y la hepatitis B.

ATC — J07CA08.

Adverse Effects and Precautions

As for vaccines in general, p.2201.

Interactions

As for vaccines in general, p.2202.

Uses and Administration

Haemophilus influenzae type b (Hib) conjugate and hepatitis B vaccines are available in some countries for active immunisation as part of the primary immunisation of infants born to HBsAg-negative mothers. In the USA, an Haemophilus influenzae type b conjugate (meningococcal protein conjugate) and hepatitis B (recombinant) vaccine is used. It is given in a schedule of 3 doses, 0.5 mL being given intramuscularly at 2 months, 4 months, and 12 to 15 months of age. Use in infants less than 6 weeks old is not recommended.

Preparations

Proprietary Preparations (details are given in Part 3)
Austral.: Comvax; ***Austria:*** Procomvax; ***Cz.:*** Procomvax; ***Ger.:*** Procomvax†; ***Gr.:*** Procomvax; ***Ital.:*** Procomvax; ***Mex.:*** Comvax; ***Neth.:*** Procomvax; ***NZ:*** Comvax; ***Pol.:*** Procomvax; ***Port.:*** Procomvax; ***USA:*** Comvax.

Haemophilus Influenzae and Meningococcal Vaccines

Profile

A combined Haemophilus influenza type b and meningococcal C conjugate vaccine is available for active immunisation in some countries; in the UK a single dose may be given to children between 1 and 10 years of age who have completed a primary vaccination course of diphtheria, tetanus, pertussis, and polio. Two doses given 2 months apart may be given to asplenic children (over 10 years of age) or adults who have not been previously immunised.

Preparations

Proprietary Preparations (details are given in Part 3)
UK: Menitorix.

Haemophilus Influenzae and Poliomyelitis Vaccines

ATC — J07CA04.

Profile

Combined haemophilus influenzae type b conjugate and inactivated poliomyelitis vaccines have been used in some countries for active immunisation of infants.

Preparations

Proprietary Preparations (details are given in Part 3)
Norw.: Act-HIB Polio†; ***Swed.:*** PolioHib†.

Haemorrhagic Fever with Renal Syndrome Vaccines

HFRS Vaccine; Vaccinum Haemorrhagia Febris cum Renis Sindronum; Vacunas de la fiebre renal epidémica.

Description. A fluid or freeze-dried preparation of a suitable hantavirus grown in the neural tissue of suckling rodents or in cell cultures and inactivated. The fluid vaccine should be stored at 2° to 8° and not allowed to freeze. The freeze-dried form should be stored below 10°.

Profile

Inactivated viral vaccines against haemorrhagic fever with renal syndrome have been investigated and are available in some countries, but there have been problems producing a sufficient and sustained immune response.

◊ References.

1. Sohn YM, *et al.* Primary humoral immune responses to formalin inactivated hemorrhagic fever with renal syndrome vaccine (Hantavax): consideration of active immunization in South Korea. *Yonsei Med J* 2001; **42:** 278–84.
2. Cho HW, *et al.* Review of an inactivated vaccine against hantaviruses. *Intervirology* 2002; **45:** 328–33.
3. Park K, *et al.* Protective effectiveness of hantavirus vaccine. *Emerg Infect Dis* 2004; **10:** 2218–20.

Helicobacter Pylori Vaccines

Vacunas de Helicobacter pylori.

Profile

Vaccines against *Helicobacter pylori* are being developed for prophylaxis of peptic ulcer disease and gastric cancer.

◊ Studies in *animals* have shown the feasibility of both prophylactic and therapeutic vaccination against *Helicobacter pylori* infection, but there have been few studies in humans. Encouraging results have been obtained with parenteral, multicomponent, aluminium hydroxide-based vaccines in terms of safety and immunogenicity. In contrast, preliminary results obtained with mucosally delivered single-component vaccines have been disappointing, partly due to the intrinsic difficulty in developing purified proteins that are sufficiently immunogenic following mucosal delivery. Studies are ongoing into the mechanisms by which the host's genetic make-up modifies the inflammatory and immunological response to *H. pylori*.[1-4]

1. Ruggiero P, *et al.* The quest for a vaccine against Helicobacter pylori: how to move from mouse to man? *Microbes Infect* 2003; **5:** 749–56.
2. Sutton P, Doidge C. Helicobacter pylori vaccines spiral into the new millennium. *Dig Liver Dis* 2003; **35:** 675–87.
3. Del Giudice G, Michetti P. Inflammation, immunity and vaccines for Helicobacter pylori. *Helicobacter* 2004; **9** (suppl 1): 23–8.
4. Agarwal K, Agarwal S. Helicobacter pylori vaccine: from past to future. *Mayo Clin Proc* 2008; **83:** 169–75.

Hepatitis A Immunoglobulins

Inmunoglobulinas contra la hepatitis A.

ATC — J06BB11.

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

Ph. Eur. 6.2 (Human Hepatitis A Immunoglobulin; Immunoglobulinum Humanum Hepatitidis A). A liquid or freeze-dried preparation containing human immunoglobulins, mainly immunoglobulin G (IgG). It is obtained from plasma from selected donors having specific antibodies against the hepatitis A virus. Normal immunoglobulin may be added. It contains not less than 600 international units/mL. The liquid preparation should be stored, protected from light, in a sealed, colourless, glass container. The freeze-dried preparation should be stored, protected from light, in a colourless, glass container under vacuum or under an inert gas.

Profile

Immunoglobulins containing high levels of specific antibodies against hepatitis A have been used in some countries for passive immunisation against hepatitis A infection; in the UK, normal immunoglobulin is usually given.

Preparations

Ph. Eur.: Human Hepatitis A Immunoglobulin.

Proprietary Preparations (details are given in Part 3)
Port.: Globuman Hepatite A†.

Hepatitis A Vaccines

Vacunas de la hepatitis A.

ATC — J07BC02.

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

Ph. Eur. 6.2 (Hepatitis A Vaccine (Inactivated, Adsorbed); Vaccinum Hepatitidis A Inactivatum Adsorbatum; Inactivated Hepatitis A Vaccine BP 2008). A liquid preparation of a suitable strain of hepatitis A virus grown in cell cultures, inactivated by a validated method, and adsorbed on a mineral carrier. It should be stored at 2° to 8°, not be allowed to freeze, and be protected from light. The BP 2008 states that Hep A may be used on the label.

Ph. Eur. 6.2 (Hepatitis A Vaccine (Inactivated, Virosome); Vaccinum Hepatitidis A Inactivatum Virosomale). A liquid preparation of a suitable strain of hepatitis A virus grown in cell cultures and inactivated by a validated method. Virosomes composed of influenza proteins and phospholipids are used as adjuvants. It should be stored at 2° to 8°, not be allowed to freeze, and be protected from light.
The BP 2008 states that HepA may be used on the label.

Adverse Effects and Precautions

As for vaccines in general, p.2201.

◊ General references.

1. Niu MT, *et al.* Two-year review of hepatitis A vaccine safety: data from the Vaccine Adverse Event Reporting System (VAERS). *Clin Infect Dis* 1998; **26:** 1475–6.

Effects on the blood. WHO has received reports of 5 cases of thrombocytopenia, 3 with purpura, associated with hepatitis A vaccine.[1]

1. Meyboom RHB, *et al.* Thrombocytopenia reported in association with hepatitis B and A vaccines. *Lancet* 1995; **345:** 1638.

Effects on the nervous system. Neurological symptoms resembling encephalitis have followed a third dose of hepatitis A vaccine.[1] Other serious neurological reactions reported in patients given inactivated hepatitis A vaccine include transverse myelitis, Guillain-Barré syndrome, and neuralgic amyotrophy.[2] Such reactions appear to be very rare, and, since other vaccines have often been given simultaneously, may not be directly attributable to hepatitis A vaccine.

1. Hughes PJ, *et al.* Probable post-hepatitis A vaccination encephalopathy. *Lancet* 1993; **342:** 302.
2. Committee on Safety of Medicines/Medicines Control Agency. Hepatitis A vaccination (Havrix). *Current Problems* 1994; **20:** 16.

Interactions

As for vaccines in general, p.2202.

Uses and Administration

Hepatitis A vaccines are used for active immunisation against hepatitis A infection.

In the UK, the use of an inactivated vaccine is recommended as an alternative to normal immunoglobulin for frequent travellers to areas of high or moderate hepatitis A endemicity or for those staying for more than 3 months in such areas; in some countries a hepatitis A immunoglobulin (p.2214) is available for those making shorter or less frequent journeys. Immunisation is also recommended in haemophiliacs, patients with chronic liver disease, and in those at risk of exposure to hepatitis A by virtue of their occupation, and should be considered in persons whose lifestyle is likely to place them at risk. The vaccine is given intramuscularly, except in haemophiliacs in whom it should be given by deep subcutaneous injection. In the UK, various vaccines are available and the dose (0.5 or 1 mL) depends on the product used and age of the patient. They may be prepared from several inactivated hepatitis A virus strains including CR326F, GBM, HM175, and RG-SB. The primary immunisation schedule for all vaccines consists of a single dose appropriate to the age of the patient and should be followed 6 to 12 months later by a booster dose. Immunity is provided for at least 10 years after these doses.

In the US, immunisation at 12 months of age (with a booster at least 6 months later) is recommended as part of the routine primary immunisation schedule. Post-exposure prophylaxis is recommended in persons who have not previously received a hepatitis A vaccine. Vaccination is also recommended for travellers to countries with intermediate to high hepatitis A endemicity.

◊ References.

1. American Academy of Pediatrics Committee on Infectious Diseases. Hepatitis A vaccine recommendations. *Pediatrics* 2007; **120:** 189–99. http://pediatrics.aappublications.org/cgi/reprint/120/1/189.pdf (accessed 15/07/08)

Vaccine development. Commercially available hepatitis A vaccines are usually produced from inactivated hepatitis A virus strains propagated in cell culture, commonly of human diploid fibroblast cells. 'Virosome' hepatitis A vaccines consisting of inactivated hepatitis A virus epitopes formulated into liposomes are also becoming available. Live attenuated hepatitis A vaccines have also been developed, although an oral live vaccine does not appear to have yet been produced.

Preparations

Ph. Eur.: Hepatitis A Vaccine (Inactivated, Adsorbed); Hepatitis A Vaccine (Inactivated, Virosome).

Proprietary Preparations (details are given in Part 3)
Arg.: Avaxim; Epaxal; Havrix; VAQTA; Virohep-A; ***Austral.:*** Avaxim; Havrix; VAQTA; ***Austria:*** Havrix; ***Belg.:*** Epaxal; Havrix; VAQTA†; ***Braz.:*** Avaxim†; Havrix†; Vacina Contra Hepatite A; VAQTA†; ***Canad.:*** Avaxim; Epaxal†; Havrix; VAQTA; ***Chile:*** Avaxim; Epaxal; Havrix; ***Cz.:*** Avaxim; Epaxal†; Havrix; VAQTA; ***Denm.:*** Epaxal; Havrix; ***Fin.:*** Epaxal; Havrix; VAQTA†; ***Fr.:*** Avaxim; Havrix; VAQTA†; ***Ger.:*** Epaxal†; Havpur; Havrix; VAQTA; ***Gr.:*** Avaxim; Epaxal; Havrix; VAQTA; ***Hong Kong:*** Avaxim; Epaxal; Havrix; VAQTA; ***Hung.:*** Avaxim; Havrix; VAQTA; ***India:*** Havrix; ***Indon.:*** Avaxim; Havrix; VAQTA; ***Irl.:*** Avaxim; Havrix; VAQTA†; ***Israel:*** Avaxim; Epaxal; Havrix; VAQTA; ***Ital.:*** Avaxim; Epaxal; Havrix; Nothav†; VAQTA; ***Malaysia:*** Avaxim; Epaxal; Havrix; VAQTA†; ***Mex.:*** Avaxim; Havrix; VAQTA; ***Neth.:*** Avaxim; Epaxal; Havrix; VAQTA; ***Norw.:*** Epaxal; Havrix; VAQTA†; ***NZ:*** Avaxim; Epaxal; Havrix; VAQTA; ***Philipp.:*** Avaxim; Epaxal; Havrix; ***Pol.:*** Avaxim; Havrix; VAQTA; ***Port.:*** Avaxim; Epaxal; Havrix; VAQTA; ***Rus.:*** Havrix (Хаврикс); VAQTA (ВАКТА); ***S.Afr.:*** Avaxim; Havrix; ***Singapore:*** Avaxim; Epaxal; Havrix; VAQTA; ***Spain:*** Avaxim; Epaxal; Havrix; VAQTA; ***Swed.:*** Avaxim; Epaxal; Havrix; VAQTA†; ***Switz.:*** Epaxal; Havrix; VAQTA†; ***Thai.:*** Avaxim; Havrix; VAQTA; ***Turk.:*** Avaxim; Epaxal; Havrix; VAQTA; ***UK:*** Avaxim; Epaxal; Havrix; VAQTA; ***USA:*** Havrix; VAQTA; ***Venez.:*** Epaxal†; Havrix.

Hepatitis B Immunoglobulins

Inmunoglobulinas contra la hepatitis B.

ATC — J06BB04.

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

Ph. Eur. 6.2 (Human Hepatitis B Immunoglobulin; Immunoglobulinum Humanum Hepatitidis B). A liquid or freeze-dried preparation containing immunoglobulins, mainly immunoglobulin G (IgG). It is obtained from plasma from selected and/or immunised donors having specific antibodies against hepatitis B surface antigen. Normal immunoglobulin may be added. It contains not less than 100 international units/mL. The liquid preparation should be stored, protected from light, in a sealed, colourless, glass container. The freeze-dried preparation should be stored, protected from light, in a colourless, glass container, under vacuum or under an inert gas.

Ph. Eur. 6.2 (Human Hepatitis B Immunoglobulin for Intravenous Administration; Immunoglobulinum Humanum Hepatitidis B ad Usum Intravenosum). A liquid or freeze-dried preparation containing immunoglobulins, mainly immunoglobulin G (IgG). It is obtained from plasma from selected and/or immunised donors having antibodies against hepatitis B surface antigen. Human normal immunoglobulin for intravenous administration may be added. It contains not less than 50 international units/mL. Storage requirements are similar to those for Human Hepatitis B Immunoglobulin, except that the freeze-dried preparation is stored at a temperature not exceeding 25°.

USP 31 (Hepatitis B Immune Globulin). A is a sterile solution consisting of globulins derived from the plasma of human donors who have high titres of antibodies against hepatitis B surface antigen. It contains 10 to 18% of protein, of which not less than 80% is monomeric immunoglobulin G. It contains glycine as a stabilising agent, and a suitable preservative. It should be stored at 2° to 8°.

Adverse Effects and Precautions

As for immunoglobulins in general, p.2201.

Preparation strength. For a warning concerning possible lack of equivalence between different preparations of hepatitis B immunoglobulins, see under Uses and Administration, below.