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Meningococcal

MENINGOCOCCAL MENINGITIS AND SEPTICAEMIA NOTIFIABLE

The disease

Meningococcal disease occurs because of a systemic bacterial infection by *Neisseria meningitidis*.

Meningococci are Gram-negative diplococci, divided into antigenically distinct capsular groups according to their polysaccharide capsule. There are currently 12 identified capsular groups, A, B, C, E, H, I, K, L, W, X, Y, and Z, of which groups B, C, W and Y are the most common causes of invasive disease in the UK. Meningococcal vaccines have significantly reduced the incidence of meningococcal disease in the past two decades.

Meningococci colonise the nasopharynx of humans, especially adolescents and young adults, and are frequently harmless commensals. In infants and young children, the carriage rate is low (Christensen *et al.*, 2010). It is not fully understood why disease develops in some individuals but not in others. Age, season, smoking, preceding viral infection and living in 'closed' or 'semi-closed' communities, such as university halls of residence or military barracks, have been identified as risk factors for disease (Cartwright, 1995; Mandal *et al.*, 2017).

Transmission is by aerosol, droplets, or direct contact with respiratory secretions of someone carrying the organism. Transmission usually requires either frequent or prolonged close contact. There is a marked seasonal variation in meningococcal disease, with peak levels in the winter months declining to low levels by late summer.

Meningococcal disease most commonly presents as meningitis and/or septicaemia. Less commonly, individuals may present with pneumonia, myocarditis, endocarditis, pericarditis, arthritis, conjunctivitis, urethritis, pharyngitis, and cervicitis (Rosenstein *et al.*, 2001). The incubation period is from two to seven days and the onset of disease varies from mild prodromal symptoms to fulminant illness with acute and overwhelming features.

The incidence of meningococcal disease is highest in children under five years of age, with a peak incidence in those under one year of age. There is a smaller secondary peak in incidence in 15-19 year-olds. The infection is fatal in 5%-10% of cases, and survivors may develop severe long-term complications including hearing loss, severe visual impairment, communication problems, limb amputation(s), seizures, and brain damage.

The implementation of meningococcal vaccines into the UK national immunisation programme since 1999 has resulted in large declines in meningococcal disease across all age groups. A large decline during 2020/21 was due to national lockdowns, restrictions and physical distancing measures associated with the COVID-19 pandemic (Figures 1 and 2) (Subbarao 2021).

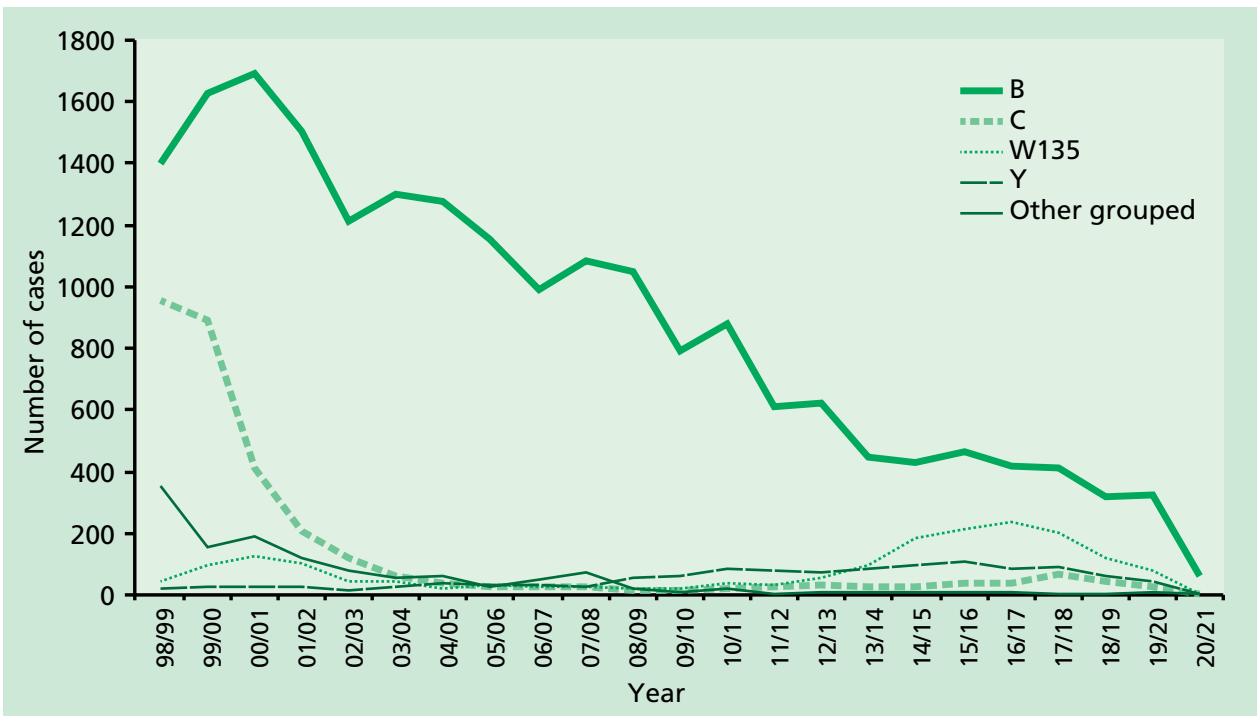
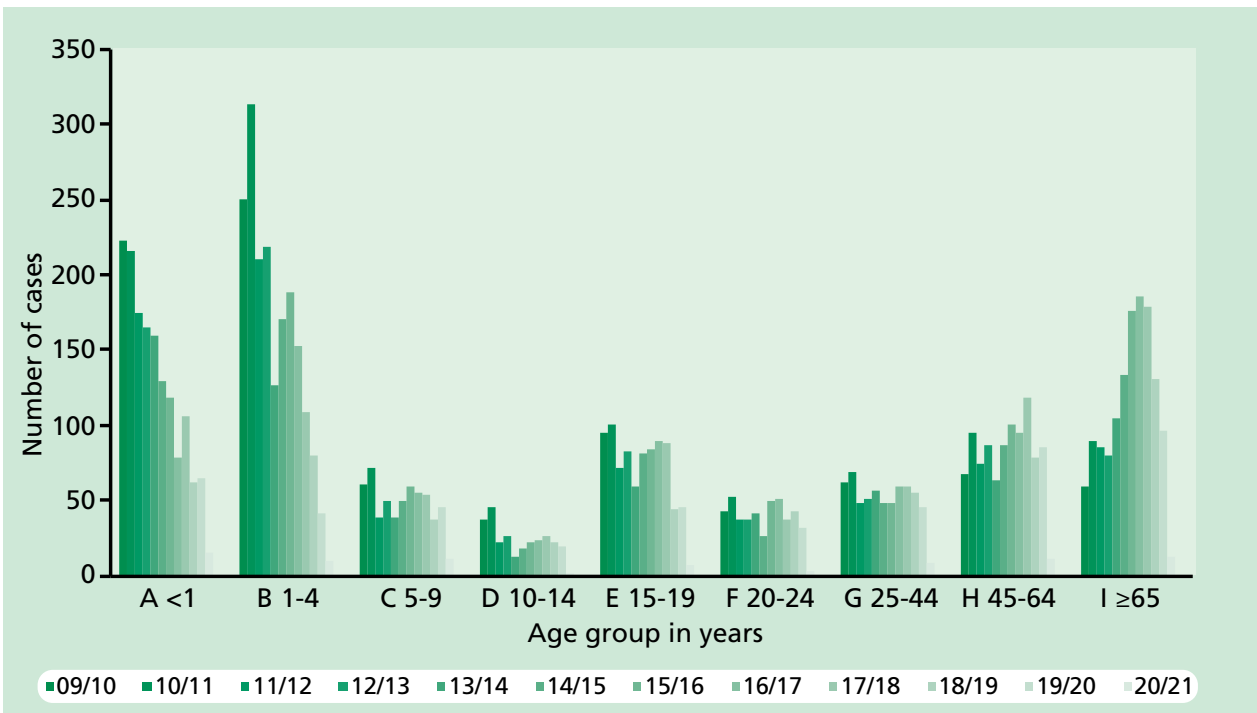


Figure 1 Cases of invasive meningococcal disease by epidemiological year, England and Wales 1998-2021. Source UKHSA Meningococcal Reference Unit, Manchester.



meningococcal

Figure 2 Cases of all invasive meningococcal disease by age group and epidemiological year, England and Wales, 2010/11 to 2020/21. Source UKHSA Meningococcal Reference Unit, Manchester

The meningococcal vaccines

Currently available vaccines are summarised in Table 1. All licensed meningococcal vaccines do not contain live organisms and, therefore, cannot cause the diseases against which they protect.

Table 1 The meningococcal vaccines

Vaccine type	Protects against	Licensed vaccines
MenC conjugate vaccine	Meningococcal group C	NeisVac-C® and Menjugate Kit®
Hib/MenC conjugate vaccine	<i>Haemophilus influenzae</i> type b/ meningococcal group C	Menitorix®
MenACWY quadrivalent conjugate vaccine	Meningococcal groups A, C, W and Y	Menveo®, Nimenrix® and MenQuadfi®
Multicomponent protein vaccine (MenB)	Meningococcal group B (may protect against other capsular groups)	Bexsero® and Trumenba®

Meningococcal conjugate vaccines

Meningococcal vaccines based solely on the capsular polysaccharide (often called 'plain' polysaccharide vaccines) provide only short-term protection to older children and adults and do not protect infants. Polysaccharide-conjugate meningococcal vaccines, however, are immunogenic across all ages and also prevent acquisition of carriage, thereby interrupting transmission of meningococci to others and inducing population (herd or indirect) protection. In infants and young children, the conjugation increases the immunogenicity of the vaccines compared to polysaccharide only vaccines and results in boosting of antibody and cellular responses with subsequent vaccine doses. Meningococcal polysaccharide-conjugate vaccines are serogroup specific and do not provide any cross-protection against other meningococcal serogroups.

MenC conjugate vaccines

The MenC conjugate vaccines are made from the capsular polysaccharide of group C *Neisseria meningitidis*, which is linked (conjugated) to a carrier protein, according to the manufacturer's method. In the UK, MenC vaccines have been used that have been conjugated with either CRM₁₉₇ (a non-toxic variant of diphtheria toxin) or tetanus toxoid. The introduction of the meningococcal group C (MenC) conjugate vaccines in 1999 was associated with large reductions in MenC disease in both vaccinated children and adolescents as well as unvaccinated adults as a result of reduced carriage rates (Maiden *et al.*, 2002) and reduced risk of exposure (Trotter *et al.*, 2003).

Hib/MenC conjugate vaccine

The Hib/MenC conjugate vaccine is made from capsular polysaccharides of *Haemophilus influenzae* type b and group C *Neisseria meningitidis*, which are both conjugated to tetanus toxoid. The routine infant schedule currently includes the Hib/MenC combination vaccine at 1 year of age.

Quadrivalent (ACWY) conjugate vaccines

The MenACWY conjugate vaccines are made from capsular polysaccharides of groups A, C, W and Y *Neisseria meningitidis*. In the UK, MenACWY vaccines are conjugated with either CRM₁₉₇ or tetanus toxoid. Since 2009, an increase in MenW disease was noted in England, which led the UK JCVI to introduce MenACWY vaccination for 14-18 year-olds and young adults under 25 years of age attending university for the first time (Campbell *et al.*, 2021).

Nimenrix® is licensed from 6 weeks of age, MenQuadfi from 12 months of age and Menveo® from 2 years of age.

4CMenB protein vaccine (Bexsero®, GSK)

In 2013, a four-component protein-based meningococcal B (4CMenB) protein vaccine (Bexsero®) was licensed authorised for children and adults in Europe. The vaccine is estimated to protect against 66-88% of MenB strains in England and Wales (Parikh *et al.*, 2017). The vaccine is made from three main *N. meningitidis* proteins produced by recombinant DNA technology (Neisseria heparin binding antigen (NHBA), Neisserial adhesion A (NadA), factor H binding protein (fHbp)) and a preparation of *N. meningitidis* group B outer membrane vesicles (OMV). 4CMenB is immunogenic in young infants (Findlow *et al.*, 2010) and adolescents (Santolaya *et al.*, 2012) and is licensed for use from two months of age. 4CMenB has been very effective in preventing MenB disease in infants and toddlers since its implementation into the UK national infant immunisation programme in September 2015 (Ladhani *et al.*, 2020). 4CMenB can also protect against infection by sero groups other than MenB (Ladhani *et al.*, 2021).

MenB-fHbp protein vaccine (Trumenba®, Pfizer)

In 2017, MenB-fHbp was authorised for individuals ≥10 years of age as a 2- or 3-dose schedule for the prevention of MenB disease (European Medicines Agency, 2018). MenB-fHbp protein vaccine (Trumenba®) is composed of two types of recombinant meningococcal lipidated fHbp, belonging to one each of subfamilies A and B, which provide broad coverage from circulating meningococcal strains (Findlow *et al.*, 2019). Laboratory studies have shown that MenB-fHbp may protect against sero groups other than MenB (Harris *et al.*, 2018).

Storage

Vaccines should be stored in the original packaging at +2°C to +8°C and protected from light. All vaccines are sensitive to some extent to heat and cold. Heat speeds up the decline in potency of most vaccines, thus reducing their shelf life. Effectiveness of vaccines may be impaired if not stored at the correct temperature. Freezing may cause increased reactogenicity and loss of potency for some vaccines. It can also cause hairline cracks in the container, leading to contamination. For further information on storage see **Chapter 3**.

Presentation

MenC conjugate vaccine

The MenC conjugate vaccine is available either as a lyophilised powder for reconstitution with a diluent or as a suspension in a syringe. After reconstitution of the lyophilised suspension, the vaccine must be used within one hour.

Discard any vaccine that is unused one hour following reconstitution. Note: the diluent must not be frozen.

Hib/MenC conjugate vaccine

Hib/MenC is supplied as a vial of white powder and 0.5mL of solvent in a pre-filled syringe. The vaccine must be reconstituted by adding the entire contents of the pre-filled syringe to the vial containing the powder. After addition of the solvent, the mixture should be shaken well until the powder is completely dissolved. After reconstitution, the vaccine should be administered promptly or allowed to stand between +2°C and +8° and be used within 24 hours.

Quadrivalent (ACWY) conjugate vaccine

Menveo is supplied as a powder in a vial and 0.5mL solution in a pre-filled syringe. The vaccine must be reconstituted by adding the entire contents of the pre-filled syringe (containing MenCWY solution) to the vial containing the powder (MenA). Nimenrix is supplied as a powder in a vial (MenACWY) and 0.5mL solvent in a pre-filled syringe. The vaccine must be reconstituted by adding the entire contents of the pre-filled syringe to the vial containing the powder. After reconstitution of either vaccine, the entire 0.5mL should be drawn up into the syringe and used immediately, but Menveo® is stable at or below 25°C for up to eight hours, and chemical and physical in-use stability has been demonstrated for eight hours at 30°C for Nimenrix®. MenQuadfi® is supplied as a solution for injection. Stability data indicate that MenQuadfi® is stable at temperatures up to 25°C for 72 hours.

4CMenB protein vaccine

4CMenB vaccine is supplied as a white opalescent liquid suspension (0.5ml) in a pre-filled syringe (single pack size) for injection. One dose (0.5ml) contains 50 micrograms each of NHBA, NadA and fHbp and 25 micrograms of OMV.

MenB-FHbp, (bivalent rLP2086) MenB protein vaccine

Trumenba suspension for injection comes in pre-filled syringe. One dose (0.5ml) contains recombinant fHbp subfamily A (60 micrograms) and fHbp subfamily B (60 micrograms), adsorbed on aluminium phosphate (0.25 milligram aluminium per dose)

Administration

All meningococcal-containing vaccines are given intramuscularly into the upper arm or anterolateral thigh. This is to reduce the risk of localised reactions, which are more common with subcutaneous injection (Mark *et al.*, 1999; Zuckerman, 2000; Diggle *et al.*, 2000). However, for individuals with a bleeding disorder, vaccines should be given by deep subcutaneous injection to reduce the risk of bleeding. When administering 4CMenB, it is important to note the information on fever and the administration of paracetamol (see 'Adverse reactions' section below).

Meningococcal vaccines can be given at the same time as other vaccines such as pneumococcal, measles, mumps and rubella (MMR), diphtheria, tetanus, pertussis, polio and Hib. The vaccines should be given at a separate site, preferably in a separate limb. If given in the same limb, they should be given at least 2.5cm apart (American Academy of Pediatrics, 2006). The site at which each vaccine is given should be noted in the child's clinical record.

Disposal

For disposal of equipment used for vaccination, including used vials, ampoules, syringes or partially discharged vaccines please see **Chapter 3**.

Recommendations for the routine use of meningococcal vaccines

The objective of the routine immunisation programme is to protect directly or indirectly those at greatest risk of meningococcal disease.

Immunisation schedule

The routine immunisation schedule, as revised in 2016, is set out in Table 2.

Table 2 Meningococcal routine vaccination schedule on their first birthday*

Age	Primary/Booster	Dose
8 weeks	Primary	One dose – 4CMenB vaccine†
16 weeks	Primary	One dose – 4CMenB vaccine†
One year	Primary (MenC) & Booster (Hib)	One dose - Hib/MenC conjugate vaccine
	Booster	One dose – 4CMenB vaccine
Around 14 years	Primary (MenAWY), Booster (MenC)	One dose - MenACWY conjugate vaccine

† Prophylactic paracetamol is advised where 4CMenB is administered to infants concomitantly with other routine vaccinations at 8 and 16 weeks – see 'Adverse Reactions' section below

Individuals with unknown or incomplete vaccination histories

When a child born in the UK presents with an inadequate immunisation history, every effort should be made to clarify what immunisations they may have had (see **Chapter 11**). Children coming to the UK who have a history of immunisation in their country of origin may not have been offered protection with all the antigens currently used in the UK, and they may not have received any meningococcal vaccines.

http://apps.who.int/immunization_monitoring/globalsummary/schedules

Children coming from developing countries, from areas of conflict, or from hard-to-reach population groups may not have been fully immunised. Where there is no reliable history of previous immunisation, it should be assumed that they are unimmunised and the full UK recommendations should be followed (see **Chapter 11**).

Infants younger than 12 months should receive the first dose of 4CMenB and a second dose of 4CMenB two months later. They should also receive the Hib/MenC dose and 4CMenB booster, ensuring at least a two-month interval between the 4CMenB doses.

Children aged one year to less than two years who received less than 2 4CMenB doses in the first year of life should receive two additional doses of 4CMenB at least two months apart.

Children aged one year to less than ten years should receive a single dose of a MenC containing vaccine: combined Hib/MenC vaccine should be used if the child has not had a Hib booster on or after their first birthday.

Additional information is available at <https://www.gov.uk/government/publications/vaccination-of-individuals-with-uncertain-or-incomplete-immunisation-status>

Children and young adults aged 10 years to less than 25 years (including students up to their 25th birthday attending university for the first time) may also be eligible for the MenACWY conjugate vaccine. Those in this age group who have never received a MenC-

containing vaccine should be offered a single dose of the MenACWY conjugate vaccine. No further vaccination is then required.

Children and adults with asplenia, splenic dysfunction or complement disorders (including those on complement inhibitor treatment)

Children and adults with asplenia or splenic dysfunction may be at increased risk of invasive meningococcal infection. Such individuals, irrespective of age or interval from splenectomy, may have a sub-optimal response to the vaccine (Balmer *et al.*, 2004). Children and adults with complement disorders (Figueroa *et al.*, 1991), or on Eculizumab therapy (a humanised monoclonal antibody that inhibits the terminal complement pathway), are at increased risk of invasive meningococcal infection (Ladhani *et al.*, 2019).

Given the increased risk, additional vaccinations against meningococcal disease are advised for individuals with asplenia or splenic dysfunction or when a complement disorder is diagnosed depending on age and vaccination history (**Chapter 7**). Individuals who are to receive Eculizumab therapy should be vaccinated at least two weeks prior to commencement of therapy (Summary of Product Characteristics for Soliris®, Alexion Europe, 2012). This advice applies to all newly diagnosed patients.

Where an opportunity arises, and depending on the individual patient's circumstances, eligible children and adults who have never received 4CMenB or MenACWY conjugate vaccine should be offered these vaccines.

Reinforcing immunisation for at risk individuals

Meningococcal ACWY conjugate vaccine.

Booster doses of MenACWY conjugate vaccine in at-risk individuals are currently not recommended because the need for, and the timing of, boosters has not yet been determined. There are currently very few infections due to these 4 serogroups because of the population protection provided by the teenage MenACWY immunisation programme.

Meningococcal B vaccine.

The need for, and the timing of, a booster dose of 4CMenB vaccine in at-risk individuals has not yet been determined.

Individuals who are travelling or going to reside abroad

All travellers should undergo a careful risk assessment that considers their itinerary, duration of stay and planned activities. In some areas of the world, the risk of acquiring meningococcal infection, particularly of developing capsular group A disease, is much higher than in the UK. Individuals who are particularly at risk are visitors who live or travel 'rough', such as backpackers, and those living or working with local people. Large epidemics of both capsular group A and W meningococcal infection have occurred in association with Hajj pilgrimages, and proof of vaccination against A, C, W and Y capsular groups is now a visa entry requirement for pilgrims and seasonal workers travelling to the Kingdom of Saudi Arabia.

Epidemics, mainly of capsular group A and more recently capsular group W infections, occur unpredictably throughout tropical Africa but particularly in the savannah during the dry season (December to June). Immunisation is recommended for long-stay or high-risk visitors to sub-Saharan Africa, for example, those who will be living or working closely with local people, or those who are backpacking.

From time to time, outbreaks of meningococcal infection may be reported from other parts of the world. Where such outbreaks are shown to be due to vaccine-preventable capsular groups, vaccination may be recommended for certain travellers to the affected areas.

Country-specific recommendations and information on the global epidemiology of meningococcal disease can be found on the following website: www.nathnac.org
www.travax.nhs.uk

Note: MenC conjugate vaccine protects against capsular group C disease only. Individuals travelling abroad (see above) should be immunised with an appropriate quadrivalent (ACWY) vaccine, even if they have previously received the MenC conjugate vaccine. There are currently no recommendations for 4CMenB vaccination for individuals who are travelling or going to reside abroad.

Table 3 Recommendations for the use of quadrivalent meningococcal ACWY vaccines for travel

Age	ACWY schedule
Birth to less than one year*	First dose of 0.5ml Second dose of 0.5ml one month after the first dose.
From one year of age (including adults)	Single dose of 0.5ml

* If an infant has already had two MenC conjugate vaccinations then two MenACWY conjugate vaccines should also be given at least 1 month after the last meningococcal conjugate vaccine.

Individuals at occupational risk

Any laboratory staff who handle strains of or clinical samples containing *Neisseria meningitidis* must receive a primary course of meningococcal ACWY conjugate vaccine and 4CMenB vaccine with booster doses of both vaccines every five years.

Contraindications

There are very few individuals who cannot receive meningococcal vaccines. When there is doubt, appropriate advice should be sought from a consultant paediatrician, immunisation co-ordinator or consultant in communicable disease control, rather than withhold immunisation. The vaccines should not be given to those who have had:

- a confirmed anaphylactic reaction to a previous dose of the vaccine, or
- a confirmed anaphylactic reaction to any constituent or excipient of the vaccine

Precautions

Minor illnesses without fever or systemic upset are not valid reasons to postpone immunisation. If an individual is acutely unwell, immunisation may be postponed until they have recovered fully. This is to avoid confusing the differential diagnosis of any acute illness by wrongly attributing any signs or symptoms to the adverse effects of the vaccine.

Pregnancy and breast-feeding

Meningococcal vaccines may be given to pregnant women when clinically indicated. There is no evidence of risk from vaccinating pregnant women or those who are breast-feeding

with inactivated virus or bacterial vaccines or toxoids (Granoff *et al.*, 2008). In cases where meningococcal immunisation has been inadvertently given in pregnancy, there has been no evidence of harm to the foetus.

Premature infants

It is important that premature infants have their immunisations at the appropriate chronological age, according to the schedule. The occurrence of apnoea following vaccination is especially increased in infants who were born very prematurely.

Very premature infants (born ≤ 28 weeks of gestation) who are in hospital should have respiratory monitoring for 48-72 hrs when given their first immunisation, particularly those with a previous history of respiratory immaturity. If the child has apnoea, bradycardia or desaturations after the first immunisation, the second immunisation should also be given in hospital, with respiratory monitoring for 48-72 hrs (Ohlsson *et al.*, 2004; Pfister *et al.*, 2004; Schulzke *et al.*, 2005; Pourcyrus *et al.*, 2007; Klein *et al.*, 2008).

As the benefit of immunisation is high in this group of infants, immunisation should not be withheld or delayed.

Immunosuppression and HIV infection

Individuals with immunosuppression and human immunodeficiency virus (HIV) infection (regardless of CD4 count) should be given meningococcal vaccines in accordance with the routine schedule. These individuals may not make a full antibody response.

Re-immunisation should be considered after treatment is finished and recovery has occurred. Specialist advice may be required.

Further guidance for the immunisation of HIV-infected individuals is provided by the Royal College of Paediatrics and Child Health (RCPCH; <http://www.rcpch.ac.uk/>), the British HIV Association (BHIVA; <http://www.bhiva.org/vaccination-guidelines.aspx>) and the Children's HIV Association (CHIVA; <http://www.chiva.org.uk/guidelines/immunisation/>).

Adverse reactions

MenC conjugate vaccine

Pain, tenderness, swelling or redness at the injection site and mild fevers are common in all age groups. In infants and toddlers, crying, irritability, drowsiness, impaired sleep, reduced eating, diarrhoea and vomiting are commonly seen. In older children and adults, headaches, myalgia and drowsiness may be seen.

Neurological reactions such as dizziness, febrile/afebrile seizures, faints, numbness and hypotonia following MenC conjugate vaccination are very rare.

Hib/MenC conjugate

Mild side effects such as irritability, loss of appetite, pain, swelling or redness at the site of the injection and slightly raised temperature commonly occur. Less commonly crying, diarrhoea, vomiting, atopic dermatitis, malaise, and fever over 39.5°C have been reported.

Quadrivalent (ACWY) conjugate vaccine

For Menveo[®], very common or common reported reactions included injection site reactions including pain, erythema, induration, and pruritus. Other very common or common

reactions include headache, nausea, rash, and malaise. Reports of all adverse reactions can be found in the Summary of Product Characteristics for Menveo® (GSK, accessed 05/01/2022).

For Nimenrix®, very common or common reported reactions included injection site reactions including pain, erythema, and swelling. Other very common or common reactions include irritability, drowsiness, headache, nausea, and loss of appetite. Reports of all adverse reactions can be found in the Summary of Product Characteristics for Nimenrix® (Pfizer, accessed 05/01/2022). (<https://www.medicines.org.uk/emc/medicine/26514#gref>)

For MenQuadfi®, Reports of all adverse reactions can be found in the Summary of Product Characteristics for MenQuadfi® (Sanofi Pasteur, accessed 05/01/2022).

4CMenB vaccine

For 4CMenB (Bexsero®), the most common local and systemic adverse reactions observed in adolescents and adults were pain at the injection site, malaise, and headache. In infants and children up to ten years of age, injection site reactions, fever ($\geq 38^{\circ}\text{C}$) and irritability were very commonly seen. Diarrhoea and vomiting, eating disorders, sleepiness, unusual crying and the development of a rash were commonly or very commonly seen in this age group. Reports of all adverse reactions can be found in the Summary of Product Characteristics for Bexsero® (GSK, accessed 05/01/2022).

In infants and children under two years of age, fever $\geq 38^{\circ}\text{C}$ (occasionally $\geq 39^{\circ}\text{C}$) was more common when 4CMenB was administered at the same time as routine vaccines (see **Chapter 11**) than when 4CMenB was given alone. The fever peaks at around 6 hours and has usually gone by 48 hours after vaccination. Prior to the introduction of 4CMenB, prophylactic paracetamol around the time of vaccination was not routinely recommended for preventing post-vaccination fever (see **Chapter 8**) because of concerns that it may lower antibody responses to some vaccines (Prymula *et al.*, 2009); although this reduction is unlikely to be clinically significant (Das *et al.*, 2014). The immunogenicity of both Bexsero® and the other routine vaccines in infants is not affected by giving paracetamol when such vaccines are co-administered with 4CMenB. (Prymula *et al.*, 2011), and paracetamol has been shown to reduce fever and other symptoms associated with vaccination (Prymula *et al.*, 2011, Das *et al.*, 2014). JCVI have recommended, therefore, that paracetamol should be given prophylactically when 4CMenB is given with the routine vaccines in infants under one year of age. A 2.5mL dose of liquid paracetamol (infant paracetamol 120mg/5ml) should be given orally as soon as possible after vaccination, followed by a second 2.5 mL dose after 4-6 hours and a third 2.5 mL dose 4-6 hours after the second dose. Should fever persist following the third dose and provided that the child appears otherwise well, additional doses of paracetamol may be administered at intervals of four to six hours for up to 48 hours. Parents should be advised to seek medical advice if their child is noticeably unwell with a fever present, or if the fever occurs at other times. Ibuprofen appears to be less effective than paracetamol at controlling fever following vaccination and is not therefore recommended (Das *et al.*, 2014).

MenB-fHbp vaccine

For MenB-fHbp (Trumenba®), the most common adverse reactions in those over 10 years of age were headache, diarrhoea, nausea, muscle pain, joint pain, fatigue, chills, and injection site pain, swelling and redness. (Pfizer, accessed 05/01/2022).

Reporting adverse events

All suspected adverse reactions to vaccines occurring in children or in individuals of any age after vaccination with vaccines labelled with a black triangle (▼), should be reported to the MHRA using the Yellow Card scheme. Serious suspected adverse reactions to vaccines in adults should be reported through the Yellow Card scheme.

Surveillance following use of 4CMenB and MenB-fHbp has not identified any serious or unexpected health problems associated with use of the vaccine.

Anyone can report a suspected adverse reaction to the Medical and Healthcare products Regulatory Agency (MHRA) using the Yellow Card reporting scheme (www.yellowcard.gov.uk).

Management of suspected cases and contacts

Current recommendations from NICE are that children and young people with suspected bacterial meningitis without non-blanching rash should be transferred directly to secondary care without giving parenteral antibiotics. If urgent transfer to hospital is not possible (for example, in remote locations or because of adverse weather conditions), antibiotics should be administered to children and young people with suspected bacterial meningitis.

For suspected meningococcal disease (fever with non-blanching rash or meningococcal septicaemia) parenteral antibiotics (intramuscular or intravenous benzylpenicillin) should be given at the earliest opportunity, either in primary or secondary care, but urgent transfer to hospital should not be delayed in order to give the parenteral antibiotics.

<http://guidance.nice.org.uk/CG102/NICEGuidance/pdf/English>

<https://www.gov.uk/government/collections/meningococcal-disease-guidance-data-and-analysis>

Management of contacts

For public health management of contacts of cases and outbreaks, advice must be sought from the local health protection team. Household contacts of cases of meningococcal infection are at increased risk of developing the disease. This risk is highest in the first seven days following onset in the index case but persists for at least four weeks. Immediate risk can be reduced by the administration of antibiotic prophylaxis to the whole contact group.

For prophylaxis, ciprofloxacin as a single dose of 500mg is recommended for adults (250mg for children aged 5-12 years and 125mg for those aged one month to four years). Alternative options are discussed at <https://www.gov.uk/government/collections/meningococcal-disease-guidance-data-and-analysis>.

For confirmed or probable MenC infection, a MenC-containing conjugate vaccine should be offered to all close contacts (of all ages) who were previously not immunised, partially immunised or vaccinated more than one year previously with a MenC conjugate containing vaccine.

For confirmed capsular group A, W or Y infections, vaccination with a MenACWY conjugate vaccine should be offered to all close contacts of any age (two doses one month apart if aged under one year; one dose in older individuals) who were previously not immunised or vaccinated more than one year previously with MenACWY conjugate vaccine.

Hib/MenC, MenACWY and/or 4CMenB vaccine should also be offered according to the recommended national schedule to any eligible unimmunised index cases. This policy ensures that persons in this age group are given equivalent protection to their age-matched immunised peers.

The 4CMenB vaccine is currently not routinely recommended for household contacts of an index case or for contacts in an educational setting. The decision to offer any meningococcal vaccine should not delay the administration of antibiotic chemoprophylaxis, which is the single most important intervention against further cases of meningococcal disease.

Any case provides an opportunity to check the vaccine status of the index case and contacts, and to ensure that eligible individuals have been fully immunised according to the UK schedule.

Management of meningococcal clusters and outbreaks

In addition to sporadic cases, outbreaks of meningococcal infections can occur particularly in closed or semi-closed communities such as schools, military establishments and universities. Advice on the management of such outbreaks should be obtained from the local Health Protection Team (HPT).

In a meningococcal cluster or outbreak, meningococcal vaccination with the appropriate meningococcal vaccine should be considered for the same group that would receive antibiotic chemoprophylaxis. For meningococcal B clusters, 4CMenB (Bexsero®) is the vaccine of choice unless the outbreak strain is predicted not to be prevented by this vaccine (using Meningococcal Antigen Typing System [MATs], for example) when MenB-fHbp (Trumenba®) may be considered. MATs results, however, are not timely and should not delay public health decisions. Additional advice on the use of 4CMenB (Bexsero®) in this setting can be accessed in Guidance for public health management of meningococcal disease in the UK:

<https://www.gov.uk/government/collections/meningococcal-disease-guidance-data-and-analysis>

Advice on the use of meningococcal vaccines in outbreaks is available from: UKHSA, Colindale (Tel: 020 8200 6868), Health Protection Scotland (Tel: 0141 300 1100) and the Scottish Haemophilus, Legionella, Meningococcus and Pneumococcus Reference Laboratory (Tel: 0141 201 8659).

Please contact the Immunisation Division at UKHSA, Colindale if you experience any delay in obtaining meningococcal vaccines for household contacts or in case of an outbreak.

Supplies

Centrally purchased vaccines for the NHS as part of the national immunisation programme can only be ordered via ImmForm. Vaccines for use as part of the national childhood immunisation programme are provided free of charge. Further information about ImmForm is available at <https://www.gov.uk/government/collections/immform>, from the ImmForm helpdesk at helpdesk@immform.org.uk or Tel: 0844 376 0040. For further information about vaccines available via ImmForm, please see ImmForm Helpsheet 13. **Vaccines for private prescriptions, occupational health use or travel are NOT provided free of charge and should be ordered from the manufacturers.**

In Northern Ireland, supplies should be obtained under the normal childhood vaccines distribution arrangements, details of which are available by contacting the Regional Pharmaceutical Procurement Service on 028 9442 4089.

In Scotland, supplies should be obtained from local childhood vaccine holding centres. Details of these are available from Procurement, Commissioning & Facilities of NHS National Services Scotland (Tel: 0131 275 6725).

4CMenB, MenC/Hib and at least one MenACWY vaccine from the list below will be available at any one time:

- Bexsero® – (4CMenB) manufactured by GlaxoSmithKline
- Menitorix® – (Hib/MenC) manufactured by GlaxoSmithKline
- MenQuadfi® – (MenACWY) manufactured by Sanofi Pasteur
- Menveo® – (MenACWY) manufactured by GlaxoSmithKline
- Nimenrix® – (MenACWY) manufactured by Pfizer

Vaccines for use outside of national programmes should be ordered directly from manufacturers:

- Bexsero® (4CMenB) – manufactured by GlaxoSmithKline (Tel: 0808 100 9997)
- Menitorix® (Hib/MenC conjugate vaccine) – manufactured by GlaxoSmithKline (Tel: 0808 100 9997)
- Menjugate® (MenC conjugate vaccine) – manufactured by GlaxoSmithKline (Tel: 0808 100 9997)
- Menveo® (Quadrivalent conjugate ACWY vaccine) – manufactured by GlaxoSmithKline (Tel: 0808 100 9997)
- NeisVac-C® (Men C conjugate vaccine) – manufactured by Pfizer (0800 0327907)
- Nimenrix® (Quadrivalent conjugate ACWY vaccine) – manufactured by Pfizer (0800 0327907)
- MenQuadfi® - (Quadrivalent conjugate ACWY vaccine) manufactured by Sanofi Pasteur 0800 854 430 (option 1)
- Trumenba® - (MenB-fHbp) manufactured by Pfizer. Visit smarthub.pfizerpro.co.uk for stock information, call Alliance healthcare to order 0344 8547749, free phone 0800 0327907

Vaccine for the national immunisation programme should not be used for the vaccination of contacts of confirmed cases and in outbreaks of MenACWY infection. Vaccine should be ordered from the manufacturers.

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