

Changes to the Meningococcal C conjugate (MenC) vaccine schedule

Questions and Answers

Background

The meningococcal C (MenC) vaccination programme was first introduced into the UK routine immunisation programme in November 1999. All children and adolescents under the age of 18 years were offered immunisation over the following two years. In 2002 the catch-up campaign was extended to include all adults less than 25 years of age.¹

In 2006, following studies that showed two doses of MenC vaccine provided good protection in the first year of life but protection waned during the second year of life, the primary immunisation course was changed to two doses at three and four months of age, and a booster dose at 12 months of age was added to extend the duration of protection.^{1,2}

Following the success of the MenC vaccination programme, disease caused by MenC has fallen by over 95% and cases are now at an extremely low level in the UK. This is due to both individual direct protection and indirect protection or herd immunity. In order to maintain these low levels of disease and herd immunity, the Joint Committee on Vaccination and Immunisation (JCVI) recommended further changes to the schedule in 2013.

What is meningococcal disease?

Meningococcal disease is caused by invasive infection with the bacterium *Neisseria meningitidis*, also known as the meningococcus. There are 12 identified serogroups of which groups B, C, W and Y were historically the most common in the UK. Since the introduction of the routine MenC vaccination programme, cases of invasive meningococcal disease in the UK due to serogroup C have reduced dramatically, with serogroup B accounting for the majority of cases.

Meningococcal infection most commonly presents as either meningitis or septicaemia, or a combination of both.

Meningococci colonise the nasopharynx of humans and are mostly harmless commensals. Between 5 and 11% of adults and up to 25% of adolescents carry the bacteria without any signs or symptoms of the disease. In infants and young children, the carriage rate is low.

Meningococcal disease is transmitted by respiratory aerosols, droplets or by direct contact with the respiratory secretions of someone carrying the bacteria. The incubation period is from two to seven days and the onset of disease varies from fulminant with acute and overwhelming features, to insidious with mild prodromal symptoms.

Who is affected by meningococcal disease?

Meningococcal disease can affect all age groups, but the rate of disease is highest in children under five years of age, with the peak incidence in those under one year of age. There is a second peak in incidence in young people aged 15 to 19 years of age.

Why is the MenC vaccination programme changing?

The objective of the routine immunisation programme is to protect those under 25 years of age and individuals outside this age range who may be at increased risk from meningococcal C disease.

JCVI have advised that changes to the schedule will make the overall MenC immunisation programme more effective and offer greater protection in teenagers and young adults. Studies show that vaccination against MenC disease in early childhood provides a relatively short-term protective immune response. Protection given by vaccination at 12 months wanes, but vaccination later in childhood provides higher levels of antibody that persist for longer.^{3,4,5,6} Evidence also shows that MenC vaccination significantly reduces nasopharyngeal carriage of the serogroup C meningococcus, providing indirect protection through herd immunity.^{7,8}

What are the changes to the MenC programme?

Infant programme: From June 2013 the second dose of MenC vaccine given at 4 months of age was removed from the routine schedule. This recommendation followed a study that showed a single priming dose in infancy at three months of age is sufficient to provide protection against MenC disease in the first year of life.⁹

Teenage booster: From September 2013 on JCVI recommendation, an adolescent booster dose of MenC was introduced into the schedule. This dose is given at the same time as the teenage tetanus, diphtheria and polio vaccine (Td/IPV), to extend protection against MenC into adolescence and early adulthood.

New starters at universities: JCVI noted that older teenagers who are beyond the age of the routine booster at the time of the introduction of the adolescent booster programme may have only received a single dose of MenC vaccine at a young age. This group are at increased risk of contracting MenC disease if they enter into higher education in a university setting for the first time.

Therefore, it is recommended that new starters at universities (first time entrants to higher education in a university setting) under 25 years of age should be offered MenC vaccine before first admission to university to boost their antibody levels prior to starting, as there is evidence to show that the acquisition of meningococcal bacteria and increased risk of disease occurs soon after entry.¹⁰ This is a time limited catch up programme running for several years

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until university entrants have received a dose of MenC vaccine routinely as part of their adolescent booster.

From late summer 2014 the MenC routine schedule is as outlined in Table 1.

Table 1 MenC routine vaccination schedule revised 2014

Age	Primary/ Booster	Dose
<u>3 months</u>	<u>Primary</u>	<u>1 dose – MenC vaccine</u> <u>NeisVac-C® or Menjugate Kit®</u> <u>ONLY</u>
<u>12-13 months</u>	<u>Booster</u>	<u>1 dose –Hib/MenC vaccine</u> <u>Menitorix®</u>
<u>From 13-14 years</u>	<u>Booster</u>	<u>1 dose – MenC Vaccine</u> <u>Any MenC conjugate vaccine</u>
<u>Temporary catch up programme for new entrants to university* (Age 17-25 years) if they have not received a MenC vaccine since the age of 10 years</u>	<u>Booster</u>	<u>1 dose – MenC Vaccine</u> <u>Any MenC conjugate vaccine</u>

*University is defined as any University or College that is a member of the Universities and Colleges Admissions Service (UCAS).

Which MenC vaccine is recommended for the primary dose at 3 months of age?

Menjugate Kit® or NeisVac-C® should be used for the dose given to infants at 3 months of age because these vaccines provide a good immune response after one dose under 1 year of age, and strong immune responses when boosted with Hib/MenC vaccine routinely given at 12 to 13 months.³

Meningitec® should **not** be used for primary vaccination of infants, as one dose does not provide adequate protection when used as a single dose in infancy and is therefore not recommended under 1 year of age.

What should be done if an infant under 1 year of age is given Meningitec® vaccine?

Meningitec® vaccine does not provide adequate protection against meningococcal serogroup C disease when administered as a single dose in infancy, and is therefore no longer recommended for use in those less than 12 months of age.

For those children who inadvertently received Meningitec® at three months of age (instead of the recommended NeisVac-C® or Menjugate Kit®), the priority must be to ensure that they receive the 12-month Menitorix® booster and, where possible, ensure that this dose is **not** delayed.

A study investigating the immune response to MenC vaccine found that a lower proportion of children (around 53%) develop protective antibody after the first dose of Meningitec® at two months of age than those vaccinated with either Menjugate® or NeisVac-C® (>80%)^{9,11}. The proportion of infants protected after a single dose of Meningitec® at 3 months is likely to be higher than published studies where infants received the vaccine at 2 months of age. After the booster dose of Menitorix® at 12 months, almost all children (>95%) will be expected to make protective antibodies against MenC, regardless of the initial vaccine received³.

Currently, MenC disease is extremely rare in the UK, especially in children, with most cases occurring in adults who often have a history of travel abroad or recent immigration to the UK. In England, less than 5% of meningococcal infections are caused by serogroup C infection, amounting to around 20-40 cases per year. In the past 10 years, on average, there have been only one or two cases each year in infants. The recent introduction of an adolescent MenC booster will also improve herd protection by boosting antibody levels prior to entering the age group at highest risk of carriage. The risk of MenC disease in infants is, therefore, likely to be very low and the period of risk is short, even if they have only received a single dose of Meningitec®.

Which MenC vaccine is recommended for the adolescent or new starter at university booster dose?

Any MenC conjugate vaccine can be used for the adolescent or new starter at university booster dose.

What about teenagers who have already received their Td/IPV vaccine and are entering university for the first time?

From late Summer 2014 a time limited catch-up programme offers MenC vaccine to new starters at university under the age of 25. This is a temporary programme that will run for several years until university entrants have received

a dose of MenC vaccine routinely as part of their adolescent booster aged 13-14 years.

The risk of meningococcal infection increases for students entering university compared with those of a similar age in the general population. The incidence of infection is:

- 5.1 cases per 100,000 in first year of university, and
- 1.4 cases per 100,000 in general population¹²

The increased risk is higher in the first few days, weeks or months of entering university^{10,13,14}. It has been suggested that increased exposure to meningococcal bacteria occurring in the first year of university leads to asymptomatic carriage that boosts immunity to provide protection over subsequent years^{12,15}.

Offering a dose of MenC vaccine over the age of ten years to those students who may be unimmunised or partially immunised will ensure satisfactory boosting of their antibody levels prior to starting university. This is important, as evidence shows that the acquisition of meningococcal bacteria and increased risk of disease occurs within the first few weeks after entry. Prospective students who are unimmunised or partially immunised against MenC disease should therefore be offered a single dose of MenC vaccine prior to entering university. This includes:

- those aged 17 to under 25 entering university for the first time and who have not received a dose of MenC conjugate vaccine age ten years or over
- students entering university for the first time, irrespective of age, who have never received a dose of MenC conjugate vaccine
- all individuals under 25 years who have never received a dose of MenC conjugate vaccine. This may include students entering or being at university who have never received a dose of MenC conjugate vaccine

Ideally the dose should be administered **at least two weeks** before attending university to ensure timely protection. Students who are not vaccinated before leaving for university should be offered the vaccine as soon as possible after they arrive to cover the period of highest risk. However they remain eligible to receive the vaccination until the end of their first university year.

Prospective students who have previously received a dose of any MenC conjugate containing vaccine (including quadrivalent meningococcal conjugate vaccine) at the age of ten years or over do not require an additional dose as they will still be protected.

For simplicity, if a prospective student's immunisation history cannot be confirmed before attending university, it is acceptable to offer a dose of MenC conjugate vaccine.

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How will new starters at university be informed that they require a MenC booster vaccine and how will they receive it?

Prospective students will be informed about the need for a booster dose of MenC vaccine through the Universities and Colleges Administration Service (UCAS). In addition in Wales from 2015 a leaflet highlighting the programme will be circulated, via schools and colleges, to all young people in academic year 13.

GP practices should offer vaccination to eligible young people when they self present or opportunistically as they access GP services. There is no requirement to operate active call and recall systems.

What about those young people who....

...are not entering university?

Studies show that young people not entering higher education in a university setting are not exposed to the same level of risk of developing MenC disease¹². However, Men C vaccine should be offered to anyone under the age of 25 who have never received a dose of MenC conjugate vaccine previously.

...are entering further education (i.e. college)?

The JCVI considers prospective students entering university as being at an increased risk of Men C disease as these students are more likely to stay in halls of residence and have close contact with new students during freshers' week. Given that the current levels of MenC disease are very low, JCVI does not recommend vaccination for those attending further education colleges as they are unlikely to be exposed to the same level of risk.

...do not receive a MenC dose before arriving at university?

It is important that eligible students, including overseas students, receive vaccination **at least two weeks** before they attend university, whenever possible, to ensure timely protection. Students who are not vaccinated before should be offered the vaccine as soon as possible after they arrive at university.

What about individuals with unknown or incomplete vaccination against meningococcal C disease?

Immunisation against infectious disease (Chapter 22, Meningococcal Table 22.3) offers guidance on Meningococcal vaccination schedule for those with unknown or incomplete vaccination histories (see Table 2 below).

Table 2- information taken from Chapter 22, meningococcal Table 22.3

Age	Dose
< 1 year	Give 1 dose of MenC vaccine (NeisVac-C or Menjugate Kit) and follow schedule from 12-13 months (leaving at least one month between primary and booster doses)
≥1 year to less than 10 years	Give one dose of Men C (or Hib/MenC if unvaccinated for Hib)
10 years to less than 25 years	<p>If never received vaccine give one dose of MenC vaccine – no further vaccination is then required</p> <p>If previously vaccinated, MenC vaccine is not required unless the last dose of menC vaccine was received under 10 years of age; then, an additional dose of MenC vaccine should be offered at the time of the routine adolescent booster (around 14 years of age) or when starting university.</p>

The Summary of Product Characteristics (SPC) for Menjugate Kit® and NeisVac-C® state two doses two months apart in infants less than a year old. What action should be taken?

Evidence from a UK study shows that immunogenicity is adequate following a single priming dose in infants.⁹ In this situation where the SPC information differs from the information within the Green Book, the information in the current chapter of the Green Book should be followed.

What if a child aged ten years or older has received a booster dose of a MenC vaccine previously?

Individuals vaccinated age ten years or older have higher levels of antibody, and protection persists until at least early adulthood and possibly longer.⁶ Therefore, if a child received a booster dose of any MenC conjugate containing vaccine (including quadrivalent meningococcal conjugate vaccine) age ten years or older, they should be adequately protected and do not need further routine scheduled doses.

Where can I get more information?

Welsh Government Chief Medical Officer letter

<http://wales.gov.uk/topics/health/cmo/publications/cmo/2014/?lang=en>

Immunisation against infectious disease (the Green Book)

<https://www.gov.uk/government/organisations/public-health-england/series/immunisation-against-infectious-disease-the-green-book>

Welsh Government leaflets

(available from:

<http://www.nhsdirect.wales.nhs.uk/encyclopaedia/v/article/vaccinations/#Leaflets>)

Improving protection against Meningitis C – Information leaflet on changes to the Men C programme (2013)

Protecting young people from Meningitis C - Information leaflet to support the adolescent booster MenC dose

Starting University? Protecting yourself against Meningitis C – Information leaflet to support the temporary programme for new starters at university.

Information on meningococcal disease is available at:

<http://howis.wales.nhs.uk/sitesplus/888/page/33665>

Public Health Wales training slidesets available from:

<http://howis.wales.nhs.uk/sites3/home.cfm?orgid=474>

MenC training slides for NHS staff on changes to the MenC programme (2013)

Current issues slide set (June 2014) - Information for health professionals on changes to the UK vaccination programme including the introduction of the MenC programme for new starters at university.

Useful links

Meningitis Research Foundation: <http://www.meningitis.org/>

Meningitis Trust: <http://www.meningitis-trust.org/>

NHS Direct Wales: <http://www.nhsdirect.wales.nhs.uk/>

Joint Committee on Vaccination and Immunisation:

<https://www.gov.uk/government/policy-advisory-groups/joint-committee-on-vaccination-and-immunisation>

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Information from Public Health England - Changes to the meningococcal C conjugate (MenC) vaccine schedule 2013-15 contributed to the development of this document.

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Acknowledgement to Public Health Wales NHS Trust to be stated.