170915

National Immunisation Advisory Committee (NIAC) Immunisation Guidelines August 2015				
Chapter	**Page**	**Previous text**	**New or added text**	**Reason for change**
Anaphylaxis	1 3	Epinephrine Adult 0.5 ml (500 micrograms) Anaphylaxis is a clinical syndrome characterised by • sudden onset AND • rapid progression of signs and symptoms AND • involving multiple (>2) organ systems, as follows:	Epinephrine Adult 0.5 -0.6 ml (500 - 600 micrograms) Anaphylaxis is a clinical syndrome characterised by • sudden onset AND • rapid progression of signs and symptoms AND • involving 2 or more organ systems, as follows:	To allow for dosage in pre filled epinephrine pens Clarification
1. General Information	6	*Inactivated vaccine* is a vaccine that contains killed bacteria or viruses, or a portion thereof. *Live attenuated* vaccine is a vaccine that contains a weakened strain of live bacteria or viruses that replicate in the body. *Recombinant vaccine* is a suspension of attenuated viruses or killed micro organisms developed through recombinant DNA techniques. *Sub unit vaccine* only contains the antigenic parts of the pathogen which are necessary to elicit a protective immune response. For convenience the term inactivated vaccine is used in these Guidelines to include all non live vaccines (e.g. inactivated, recombinant, subunit).	*Conjugate vaccine* is one where a protein or polysaccharide antigen is linked to a carrier protein e.g. meningococcal C conjugate vaccine. *Inactivated vaccine* is a vaccine that contains killed bacteria or viruses, or a portion thereof e.g. inactivated polio vaccine *Recombinant vaccine* is a vaccine produced through recombinant DNA technology e.g. hepatitis B and human papillomavirus vaccine *Sub unit vaccine* contains only specific antigenic proteins of an infectious agent e.g. acellular pertussis and some influenza vaccines. *Live attenuated* vaccine is a vaccine that contains a weakened strain of live bacteria or viruses that replicate in the body e.g.	Clarification

			BCG and MMR vaccines. For convenience the term non live vaccine is used in these Guidelines to include conjugate, inactivated, recombinant and subunit vaccines.	
2. General Immunisation Procedures	3	**Vaccination before minimum recommended age or interval** However, giving a dose 4 days or less before the minimum recommended interval is unlikely to have a significant adverse effect on the immune response to that dose, and does not need to be repeated.	**Vaccination before minimum recommended age or interval** However, giving a dose 4 days or less before the minimum age or interval is unlikely to have a significant adverse effect on the immune response to that dose, and does not need to be repeated. (This does not apply to the second dose of HPV vaccine in a two dose schedule).	Clarification
	7	**Table 2.3** **12 months to <4 years** PCV 1 dose (omit if > 2 years of age **18 and older** MMR 2 doses 1 month apart[4] Td/IPV 1 month after Tdap/IPV [4] For health care workers born in Ireland since 1978 or born outside Ireland; and for adults from low resource countries, without evidence of two doses of MMR vaccine	**Table 2.3** **1 to <4 years** PCV 1 dose (omit if ≥ 2 years of age **18 and older** MMR 2 doses 1 month apart[4] Td/IPV 1 month after Tdap/IPV 2 doses 1 month apart [4] For health care workers born in Ireland since 1978 or born outside Ireland; for contacts in outbreaks born in Ireland since 1978 or born outside Ireland and for adults from low resource countries, without evidence of two doses of MMR vaccine	Erratum Addition of contacts in outbreaks
	8	Contraindications • All vaccines: Anaphylaxis to a vaccine or to one of its constituents or a constituent of the syringe, syringe cap or vial (e.g. Latex anaphylaxis).	Contraindications • All vaccines: Anaphylaxis to a vaccine or to one of its constituents or a constituent of the syringe, syringe cap or vial (e.g. Latex anaphylaxis). If a person has had anaphylaxis caused by	Clarification about latex anaphylaxis

			latex, vaccines supplied in vials or syringes that contain natural rubber should not be administered unless the benefit of vaccination outweighs the risk for a potential allergic reaction. For those with contact allergy to latex gloves, vaccines supplied in vials or syringes that contain dry natural rubber or rubber latex may be given.	
	10	2. **Persons with bleeding disorders or on anticoagulants** When vaccines are given intramuscularly to persons with bleeding disorders or on anticoagulants, it is prudent to use a 23 gauge or finer needle and to apply gentle pressure to the vaccine site for 1-2 minutes after the injections.	2. **Persons with bleeding disorders or on anticoagulants** When vaccines are given intramuscularly to persons with bleeding disorders or on anticoagulants, it is prudent to use a 23 gauge or wider needle to reduce the pressure gradient and cause less trauma to the tissues, and to apply gentle pressure to the vaccine site for 1-2 minutes after the injections.	Rationale for using higher gauge needle Correction from finer to wider needle
	12	MMR or varicella vaccine should not be given from 2 weeks before to 5 -11 months after injection of HNIG as they may interfere with the immune response (see Table 2.4).	MMR or varicella vaccine should not be given from 2 weeks before to 5 -11 months after injection of HNIG as it may interfere with their immune response (see Table 2.4). This does not apply to Zoster vaccine. The amount of antigen in zoster vaccine is high enough to offset any effect of circulating antibody. Also, studies of zoster vaccine were performed on patients receiving antibody-containing blood products with no appreciable effect on vaccine efficacy.	Addition of information re zoster vaccine and HNIG
	13	Blood products Inactivated vaccines and some live vaccines (BCG, rotavirus and yellow fever) can be administered at the same time or at any interval before or after	Blood products, non-live vaccines and some live vaccines (BCG, rotavirus, yellow fever and zoster) can be administered at the same time or at any interval before or	Addition of information re zoster vaccine

	blood product.	after blood product.	
13	Table 2.4	Packed RBCs and whole blood IV 10ml/Kg 6 month interval	Addition of whole blood as per ACIP General recommendations in Immunization 2011
14	Four-week minimum interval if not administered simultaneously (except oral rotavirus vaccine which can be administered at any time before, with or after other live vaccines given parenterally).	New Table 2.5	Joint Committee on Vaccination and Immunisation (JCVI) 2014. Minutes of the February 2014 meeting. https://www.gov.uk/government/groups/joint-committee-on-vaccination-and-immunisation Mullooly J, Black, S. (2001). Simultaneous administration of varicella vaccine and other recommended childhood vaccines. United States. Nov 30; 2001. 50 (47). Pp. 1058-1061. Nascimento, Silva JR et al (2011). Mutual interference on the immune response to Yellow Fever vaccine and combined vaccines against measles, mumps and rubella. Vaccine, 2011 29 (3). 6327- 6334. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5047a4.htm Petralli JK, Merigan TC, Wilbur JR. Action of endogenous interferon against vaccinia infection in children. Lancet 1965;286(7409):401-405. Plotkin, S. Orenstein, W.A. Offit, P.A (2013). *Vaccines*. Measles vaccines. Elsevier Saunders, China.
14	Small air bubbles (less than the internal diameter of the syringe) do not need to be expelled.	Small air bubbles (less than the internal diameter of the syringe) do not need to be expelled, except for intradermal injections.	Erratum
15	It is not necessary to use gloves for routine intradermal, subcutaneous and intramuscular injections	It is not necessary to use gloves for routine intradermal, subcutaneous and intramuscular injections, unless likely to come into contact with potentially infectious body fluids or unless the health	New recommendation

		care worker has a lesion on his or her hand. If gloves are worn they should be changed for each patient.	
17	Light triangle indicates site for IM injection into the deltoid (upper border of triangle is approximately 2 finger-breadths below the acromion process).	Light triangle indicates site for IM injection into the deltoid (upper border of triangle is approximately 2 finger-breadths below the acromion process and the apex is at the mid point of the humerus) The recommended site is in the middle of the triangle.	
18	There are only two routinely recommended SC sites for administration of vaccines, the fatty area of the anterolateral thigh and the deltoid region (upper arm).	There are only two routinely recommended SC sites for administration of vaccines, the middle third of the anterolateral thigh and the deltoid region.	Clarification
18	Table 2.7	the middle third of the anterolateral thigh	Clarification
22	**Ingestion of sweet-tasting liquids or breastfeeding** Several studies have demonstrated a reduction in crying after injections when children 1 year or younger ingest a small amount (a few drops to half a teaspoon) of a 24-30% sugar solution just prior to an injection. Breastfeeding has also been shown as a soothing measure for infants receiving injections, and there is some evidence that breastfeeding can decrease the incidence of fever after immunisations.	**Ingestion of sweet-tasting liquids or breastfeeding** Several studies have demonstrated a reduction in crying after injections when children 1 year or younger ingest a small amount (a few drops to half a teaspoon) of a 24-30% sugar solution just prior to an injection. Breastfeeding has also been shown as a soothing measure for infants receiving injections, and there is some evidence that breastfeeding can decrease the incidence of fever after immunisations. Both licensed rotavirus vaccines contain approximately 20% sucrose; if indicated, they should be administered just before recommended injections instead of a sucrose solution.	New recommendation
23	**Tactile stimulation** Rubbing or stroking the skin near the	**Tactile stimulation** Rubbing, stroking or applying pressure	Clarification Taddio A, et al. (2009). Physical Interventions

		injection site with moderate intensity may decrease pain in older children (4 years and older) and adults.	close to the injection site before and during injection may decrease pain in older children (4 years and older) and adults.	and Injection Techniques for Reducing Injection Pain During Routine Childhood Immunizations. Clin Ther. 2009;31[Suppl B]: S48-S76
	23	Analgesia, Antipyretics and Vaccines Fever is a normal part of the inflammatory response, and is well-known to occur after vaccination. It is associated with improved antigen recognition, increased T-cell activity and immune responses. Fever which occurs after vaccination is generally benign and self-limiting; it rarely rises above 39.5oC. Antipyretic drugs do not prevent febrile convulsions in at-risk children. Either paracetamol or ibuprofen may be considered for treatment of fever >39.50C or for a significant reaction at the site of vaccination. Prophylactic use of antipyretics such as paracetamol and ibuprofen, at or shortly after vaccination may result in significant reduction in the primary antibody responses to some vaccine antigens. It is likely that this reduction in the immune response is due to interference by antipyretics with the inflammatory response at the injection site. In light of the above it is recommended that prophylactic antipyretics should not be given at the time of vaccination.	Antipyretics and Vaccines Fever is a normal part of the inflammatory response, and is well-known to occur after vaccination. It is associated with improved antigen recognition, increased T-cell activity and immune responses. Fever which occurs after vaccination is generally benign and self-limiting; it rarely rises above 39.5oC. Antipyretic drugs do not prevent febrile convulsions in at-risk children. Either paracetamol or ibuprofen may be considered for treatment of fever >39.50C or for a significant reaction at the site of vaccination. As there is a high incidence of fever >39.5^{0}C following MenB vaccine, prophylactic use of paracetamol at the time of or closely after vaccination may be considered, as it has been shown to reduce the incidence and severity of fever in children under 2 years of age.	Ipp M et al (2009). Order of vaccine injection and infant pain response. Arch Pediatr Adolesc Med;163:469–472. Shah V et al (2015) HELPinKids&Adults. Pharmacological and combined interventions to reduce vaccine injection pain in children and adults: systematic review and meta-analysis. Clin J Pain (in press). Taddio A et al (2015), A randomized trial of rotavirus vaccine versus sucrose solution for vaccine injection pain. Vaccine 33 (2015) 2939–2943 New recommendation
3. Immunisation of Immunocompromised Persons			Revised chapter	New information

4. Immunisation and Health Information for Health Care Workers and Others in At Risk Occupations	1	Group 1: Health Care Workers (HCW) This refers to those who have direct patient contact, both clinical and nonclinical staff. • Medical, Nursing, and Allied Health Professionals • Medical and Nursing Students	Group 1: Health Care Workers (HCW) This refers to those who have direct patient contact, both clinical and nonclinical staff. • Medical, Nursing, and Allied Health Professionals • Medical, Nursing and Allied Health Students	Clarification
	3	**MMR** Those who do not have serological evidence of infection or documented evidence of 2 doses of MMR vaccine should be given 1 or 2 doses of MMR as required separated by at least 1 month.	**MMR** Those who do not have serological evidence of infection or documented evidence of 2 doses of MMR vaccine should be given 1 or 2 doses of MMR as required separated by at least 1 month so that a total of 2 doses are received.	Clarification
	5	**Other Micro-Organisms** • Medical laboratory staff working in higher risk settings (e.g. reference laboratories or working in infectious disease units or with other clinical contact) or those conducting research into specific organisms should be considered for immunisation against these organisms (e.g. Japanese encephalitis, cholera, meningococcal ACWY, typhoid, influenza, varicella and rabies).	**Other Micro-Organisms** • Medical laboratory staff working in higher risk settings (e.g. reference laboratories or working in infectious disease units or with other clinical contact) or those conducting research into specific organisms should be considered for immunisation against these organisms (e.g. Japanese encephalitis, cholera, meningococcal ACWY, meningococcal B, typhoid, influenza, varicella and rabies).	Addition of meningococcal B
5. Immunisations and Health Information for Travel	4	**Table 5.1** Hepatitis B (if born on or after 1/7/2008)	**Table 5.1** Hepatitis B (if born before 1/7/2008)	Erratum
	18	One dose confers life-long protection and a booster dose of yellow fever vaccine is not medically indicated. However, International Health Regulations (2005) require re-vaccination at 10 year intervals if indicated, in order to retain a valid International Certificate of Vaccination Prophylaxis.	Duration of protection: At least 35 years, with some exceptions.	Updated guidance

	An up to date list of licensed vaccines can be accessed on the IMB website www.imb.ie Dose and route of administration The dose is 0.5 ml subcutaneously, for all ages Indications Mandatory vaccination presently concerns only yellow fever. Yellow fever vaccination is carried out for two reasons: 1. To protect the individual in areas where there is a risk of yellow fever infection. 2. To protect vulnerable countries from importation of the yellow fever virus.	An up to date list of licensed vaccines can be accessed on the HPRA website www.hpra.ie Dose and route of administration The dose is 0.5 ml subcutaneously,at least 10 days before entering an endemic area **Indications** Active immunisation against yellow fever in persons: • travelling to, passing through or living in an endemic area, • travelling to any country that requires an International Certificate of Vaccination for entry • handling potentially infectious materials (e.g. laboratory personnel) Re-vaccination (see Figure 5.1) should be offered to those: • who need a valid International Certificate of Vaccination or Prophylaxis (ICVP) • who received their initial yellow fever vaccination: - when aged less than two years old - during pregnancy - whilst infected with HIV - when immunosuppressed - before undergoing a bone marrow	

			transplant The WHO are seeking to implement this change in 2016. However some countries may continue to require 10 yearly revaccination despite WHO guidance. Practitioners may choose to give exemption certificate to avoid unnecessary boosting. Presently (July, 2015) the International Health Regulations (2005) require re-vaccination at 10 year intervals if indicated, in order to retain a valid International Certificate of Vaccination Prophylaxis.	
	19	Precautions: 4. Age >60 years of age unless at high risk as the risk for yellow fever vaccine associated neurotropic disease (YEL-AND) and yellow fever vaccine associated viscerotropic disease (YEL-AVD) increases with age. Adverse reactions General: Yellow fever vaccine associated viscerotropic disease (YEL-AVD, mortality rate >60%)	Precautions: 4. Age >60 years of age unless there is a considerable and unavoidable risk of acquiring yellow fever infection , as the risk for yellow fever vaccine associated neurotropic disease (YEL-AND) and yellow fever vaccine associated viscerotropic disease (YEL-AVD) increases with age. 5. When possible, YFV and MMR should be given 28 days apart, at separate sites and in a different limb. This is because of sub-optimal antibody responses to YF, mumps and rubella antigens when the vaccines are co-administered Adverse reactions General: Yellow fever vaccine associated viscerotropic disease (YEL-AVD, mortality rate >60%) The risks of YEL-AND and YEL-AVD appear to be higher in those aged over 60 years.	World Health Organization. Meeting of the Strategic Advisory Group of Experts on immunization, April 2013 – conclusions and recommendations. Wkly Epid Rec. 17 May 2013; 88, 201–216. http://www.who.int/wer/2013/wer8820.pdf World Health Organization. Vaccines and vaccination against yellow fever. WHO Position Paper, June 2013. Wkly Epid Rec. 5 July, 2013:27.88: 269-284.

6. Diphtheria	4	Indications 1.Primary vaccination The primary course consists of 3 doses given at 2, 4 and 6 months as 6 in 1 vaccine (DTaP/IPV/Hib/Hep B). The 6 in 1 vaccine should be given before PCV, as it is less painful.	Indications 1.Primary vaccination The primary course consists of 3 doses given at 2, 4 and 6 months as 6 in 1 vaccine (DTaP/IPV/Hib/Hep B). The 6 in 1 vaccine should be given before PCV, as it is less painful.	New recommendation
8 Hepatitis A	6	The schedule for monovalent Hepatitis A (and combined Hepatitis A and typhoid) vaccines is a single dose of 0.5mls followed by a booster at 6-12 months.	The schedule for monovalent Hepatitis A (and combined Hepatitis A and typhoid) vaccines is a single dose of 0.5 or 1ml followed by a booster at 6-12 months.	Erratum
9. Hepatitis B	1	The World Health Organization(WHO) estimates that over 240 million people worldwide are chronically infected with HBV	It is estimated that there are at least 350 million chronically infected cases of HBV worldwide.	Update
	8	In the event of non-response to primary hepatitis B vaccination, a repeated course of vaccination, preferably with an alternative hepatitis B vaccine, results in protective anti-HBs titres in 50 to 100% of previous nonresponders. Administration of a double dose of combined hepatitis A and B vaccine can induce a protective anti-HBs response in some previous nonresponders		Delete – see page 13
	12	Testing should be performed 2 months after the last dose of vaccine	**Anti-HBs testing should be performed 2 months after the last dose of vaccine.**	Highlighted text
	13	Post vaccination serology testing is not required for children receiving hepatitis B vaccine as part of the routine primary childhood immunisation schedule.	Post vaccination serology testing is not required for children receiving hepatitis B vaccine as part of the routine primary childhood immunisation schedule, or for those at low-risk.	Clarification

	13	Anti-HBs levels above10 mIU/ml are accepted as protecting against HBV (Table 9.2 and Table 9.3).	Anti-HBs levels above10 mIU/ml are accepted as protecting against HBV for those at low risk (Table 9.2 and Table 9.3). For those at high risk of HBV infection • For those with a level of anti-HBs <10m IU/ml. 2 months after the third dose, a repeated course of vaccination, preferably with an alternative hepatitis B vaccine, is recommended. This results in protective anti-HBs titres in 50 to 100% of previous non-responders. • If there is still no response (anti-HBs <10m IU/ml. 2 months after the third dose) administration of a course of a double dose (2 mls) of combined hepatitis A and B vaccine (Twinrix) is recommended at 0, 1 and 6 months as this can induce a protective anti-HBs response in >90% of non-responders. • If there is still no response (anti-HBs <10mIU/ml two months after the third dose), a single dose of Fendrix should be offered and anti-HBs checked 2 months later.	Updated guidance
11. Influenza			Revised chapter	Updated information Reference to live attenuated influenza vaccine
12. Measles	6	**MMR** Those who do not have serological evidence of infection or documented evidence of 2 doses of MMR vaccine should be given 1 or 2 doses of MMR as required separated by at least 1 month.	**MMR** Those who do not have serological evidence of infection or documented evidence of 2 doses of MMR vaccine should be given 1 or 2 doses of MMR as required separated by at least 1 month, so that a total of 2 doses are received.	Clarification

	7	**Contraindications**	**Contraindications** 4. MMR should not be administered on the same day as yellow fever vaccine as co-administration of these two vaccines can lead to suboptimal antibody responses to mumps rubella and yellow fever antigens. If rapid protection is required then the vaccines should be given on the same day or at any interval and an additional dose of MMR should be given.	New recommendation
	7	**Precautions** 3. Recent administration of blood or blood products. Blood and blood products may contain significant levels of virus-specific antibodies, which could prevent vaccine virus replication. Where possible, MMR should be deferred for at least 3 months after receipt of low-dose immunoglobulin, 6 months after red-cell transfusion, and 11 months after high-dose immunoglobulin (as used for e.g. Kawasaki Disease) see Chapter 2 Table 2.4.	**Precautions** 3. Recent administration of blood or blood products. Blood and blood products may contain significant levels of virus-specific antibodies, which could prevent vaccine virus replication. MMR should be deferred for at least 5 months after receipt of low-dose HNIG, 6 months after packed red-cell or whole-blood transfusion and 11 months after high-dose HNIG (as used for e.g. Kawasaki Disease) see Chapter 2 Table 2.4.	Clarification
13. Meningococcal	6	Health Care Workers (HCWs) (including those present at autopsy) whose mouth and nose is directly exposed to respiratory droplets or secretions of a probable or confirmed case of meningococcal disease within 24 hours of the commencement of antibiotics i.e. those carrying out high risk procedures and when within one metre of a patient.	Health Care Workers (HCWs) (including those present at autopsy) whose mouth and nose is directly exposed to respiratory droplets or secretions of a probable or confirmed case of meningococcal disease within 24 hours of the commencement of antibiotics i.e. those carrying out high risk procedures and when within one metre of a patient. High risk procedures are those which may result in generation of respiratory droplets (such as may occur during intubation, naso-pharyngeal or tracheal suctioning)	Clarification

		HCWs should wear masks (surgical or shield as appropriate) when in close contact with an infectious case in the 24 hours after starting antibiotic treatment.	within 24 hours of commencement of appropriate systemic antibiotics. *HCWs should wear masks (surgical or shield as appropriate) when in close contact with an infectious case in the 24 hours after starting antibiotic treatment.* Chemoprophylaxis (and vaccination) is not recommended without a clear history of such high risk exposure. Health care workers (HCWs) are not considered to be at particularly increased risk of disease unless directly exposed to large particle droplets/ secretions from the respiratory tract of a case within the period of infectivity.	
	8	**1. Conjugate meningococcal C vaccine (MenC)** Men C conjugate vaccines (Menjugate, Meningitec) are made from Men C capsular polysaccharide conjugated to CRM-197 protein. They induce a T-cell dependent memory response from 6 weeks of age.	**1. Conjugate meningococcal C vaccines (MenC)** Menjugate and Meningitec are made from meningococcal C capsular polysaccharide conjugated to CRM-197 protein. NeisVac C contains meningococcal C polysaccharide conjugated to tetanus toxoid. These 3 vaccines induce a T-cell dependent memory response from 6 weeks of age and are indicated for immunisation of infants from the age of 2 months, children and adults. Menitorix contains meningococcal C and haemophilus B antigens conjugated to tetanus toxoid (for use between 2 months and 2 years of age).	Additional information
	8	**Table 13.1** 12 months	**Table 13.1** 13 months	Erratum

		12 years 1 dose if not previously vaccinated	12 -13 years 1 dose if not previously vaccinated at ≥10 years of age	To be consistent with routine schedule Table 2.1 in Chapter 2 and text on page 11
	9	**Table 13.2**	**New Table 13.2**	MenACWY for at risk children under 1 year Better clarity re numbers of doses required
	9	**3. Meningococcal group B Vaccine (rDNA) (Bexsero) MenB** This is a recombinant multicomponent meningococcal B vaccine. It is indicated for active immunisation of individuals from 2 months of age and older against invasive meningococcal disease caused by *Neisseria meningitidis* group B. There are no data on its use in adults older than 50 years of age.	**3. Meningococcal group B Vaccine (rDNA) (Bexsero) MenB** This is a recombinant multicomponent meningococcal B vaccine. It is indicated for active immunisation of individuals from 2 months of age and older against invasive meningococcal disease caused by *Neisseria meningitidis* group B. There are no data on its use in adults older than 50 years of age, but it is recommended for at-risk persons aged over 50 years.	New recommendation
	10	**Table 13.3.** 2- < 6months Three doses	**Table 13.3.** 2- < 6months Two doses	New recommendation
	10	**Unvaccinated persons aged 12 to <23 years** ***MenC (1 dose)*** is recommended for all unvaccinated persons aged 13 to 23 years of age.	**Unvaccinated persons aged 13 to <23 years** ***MenC (1 dose)*** is recommended for all unvaccinated persons aged 13 to 23 years of age.	Erratum
	11	*Functional or anatomic asplenia or hyposplenism* Children < 2 years of age should, in addition to all routine immunisations, receive 2 doses of MenACWY ≥ 2 months after the 13 months MenC dose.	*Functional or anatomic asplenia or hyposplenism* Children < 2 years of age should, in addition to all routine immunisations, receive 2 doses of MenACWY at least 2 months apart (see Chapter 3). MenACWY can be given instead of routine MenC at 4 months if not already given.	New recommendation
	11	*Immunodeficiency due to disease or treatment* One dose of MenACWY is recommended for	*Immunodeficiency due to disease or treatment* Two doses of MenACWY are recommended	Errata

		all patients.	two months apart regardless of meningococcal vaccination history.	
	12	**3.2 MenB vaccine** is recommended for: • Those with functional or anatomic asplenia or hyposplenism (including splenectomy, haemoglobinopathies, and coeliac disease) • Those with complement or properdin deficiency • Those with immunodeficiency due to disease or treatment (including Eculizumab (Soliris)) • Haematopoietic Stem Cell Transplant (HSCT) recipients • Solid organ transplant (SOT) candidates and recipients (See Table 13.2 for number of doses) **4. Index cases** *4.2 Serogroup A, W or Y disease* **MenACWY vaccine** is recommended for index cases to provide protection against all four groups, even though recurrent meningococcal infection is rare. See Table 13.1 for detail on vaccine and dose.	3.2 **MenB vaccine** is recommended for: • Those with functional or anatomic asplenia or hyposplenism (including splenectomy, haemoglobinopathies, and coeliac disease) • Those with complement or properdin deficiency • Those with Down syndrome • Those with immunodeficiency due to disease or treatment (including Eculizumab (Soliris)) • Haematopoietic Stem Cell Transplant (HSCT) recipients • Solid organ transplant (SOT) candidates and recipients (See Table 13.3 for number of doses) **4. Index cases** *4.2 Serogroup A, W or Y disease* **MenACWY vaccine** is recommended for index cases to provide protection against all four groups, even though recurrent meningococcal infection is rare. See Table 13.2 for detail on vaccine and dose.	Addition of Down syndrome Errata
	12	**4. Index cases**	**4. Index cases** *4.3 Serogroup B disease* ***MenB vaccine*** is recommended for index cases of any age who have not previously received Men B vaccine	Addition of MenB for cases of MenB disease
	13	**5. Contacts of cases** *5.1 Serogroup C disease* ***MenC vaccine*** is recommended for all previously unimmunised close contacts (of all ages) in addition to chemoprophylaxis.	*5.2 Serogroup C disease* ***MenC vaccine*** is recommended for all previously unimmunised close contacts from 6 weeks of age in addition to chemoprophylaxis.	Clarification

	16	**Co administration with other vaccines** Due to an increased risk of fever, local reactions, change in eating habits and irritability when MenB vaccine is co-administered with other vaccines it may be preferable to administer this vaccine with an interval of 1 week before or after other vaccines.	**Co administration with other vaccines** MenB vaccine can be given at the same as DTaP,IPV, Hib, Hep B, PCV, MenACWY, MMR and Varicella vaccines. Men B vaccine should be given in a different limb.	New recommendation
14. Mumps	4	**MMR** Those who do not have evidence either of mumps infection or having received 2 doses of MMR vaccine should be given 1 or 2 doses of MMR as required separated by at least 1 month.	**MMR** Those who do not have serological evidence of infection or documented evidence of 2 doses of MMR vaccine should be given 1 or 2 doses of MMR as required separated by at least 1 month so that a total of 2 doses are received.	Clarification
	5	**Contraindications**	**Contraindications** 4. MMR should not be administered on the same day as yellow fever vaccine as co-administration of these two vaccines can lead to suboptimal antibody responses to yellow fever, mumps and rubella antigens. If rapid protection is required then the vaccines should be given on the same day or at any interval and an additional dose of MMR should be given.	New recommendation
	6	Precautions 3. Where possible, MMR should be deferred for at least 3 months after receipt of low-dose immunoglobulin, 6 months after red-cell transfusion, and 11 months after high-dose immunoglobulin (as used for e.g. Kawasaki Disease) see Chapter 2 Table 2.4.	Precautions 3. MMR should be deferred for at least 5 months after receipt of low-dose HNIG, 6 months after packed red-cell or whole-blood transfusion and 11 months after high-dose HNIG (as used for e.g. Kawasaki Disease) see Chapter 2 Table 2.4.	Clarification

15. Pertussis	2	Although vaccine uptake has increased since 2001 the number of notifications increased in 2012 (see Figure 15.2). These occurred in older children and adults and are most likely to be associated with waning immunity.	Although vaccine uptake has increased since 2001 the number of notifications increased in 2012 (see Figures 15.2 and 15.3). In 2012 the age group most affected was <12 months of age (infants), particularly those aged<6 months with 143 notifications. Many of the infants are infected before they have had an opportunity to start their immunisation schedule. It is for this group that maternal vaccination during pregnancy is particularly important, as it is only through maternal-foetal antibody transfer that they can obtain some protection against pertussis infection.	Moore DL et al. (2004). Lack of evidence of encephalopathy related to pertussis vaccine: active surveillance by IMPACT, Canada, 1993-2002. Pediatr Infect Dis J. 23(6):568-71. Pahud BA et al (2012). Lack of association between childhood immunizations and encephalitis in California, 1998-2008. Vaccine. 5; 30(2):247-53. doi: 10.1016/j.vaccine.2011.10.104. Epub 2011 Nov 12.
	7	Indications 1.Primary vaccination The primary course consists of 3 doses given at 2, 4 and 6 months as 6 in 1 vaccine (DTaP/IPV/Hib/Hep B).	Indications 1.Primary vaccination The primary course consists of 3 doses given at 2, 4 and 6 months as 6 in 1 vaccine (DTaP/IPV/Hib/Hep B). The 6 in 1 vaccine should be given before PCV, as it is less painful.	New recommendation
16. Pneumococcal	9	**Cases of invasive pneumococcal disease (IPD)** All children under 5 years of age who have had IPD, even if not in a clinical risk group, should receive a dose of PCV irrespective of vaccine history. Children under 12 months who are unvaccinated or partially vaccinated should complete the routine immunisation schedule.	**Cases of invasive pneumococcal disease (IPD)** Following IPD in a child under 5 years of age, full blood count, immunoglobulin levels (including IgG sub classes) and complement levels should be checked. All children under 5 years of age who have had IPD, even if not in a clinical risk group, should receive a dose of PCV irrespective of vaccine history followed by a dose of PPV 2 months later (at or after 2 years of age).	Addition of PPV for cases of IPD< 5 years as Table 16.1

			Children under 12 months who are unvaccinated or partially vaccinated should complete the routine immunisation schedule followed by an additional dose of PCV 2 months after their 12 month dose, and a dose of PPV23 at 2 years of age.	
	10	**Precautions (PCV and PPV)** Acute severe febrile illness; defer until recovery. **PPV only**. Revaccination within 5 years of a previous dose of PPV. However, if the vaccine has been given during chemotherapy or radiotherapy, revaccination 3 months after treatment is recommended.	**Precautions (PCV and PPV23)** Acute severe febrile illness; defer until recovery. **PPV23 only**. Revaccination within 5 years of a previous dose of PPV. However, if the vaccine has been given during chemotherapy or radiotherapy, revaccination 3 months after treatment is recommended. **Pregnancy and breast feeding** PPV23 can be given to pregnant women in Group A Table 16.1. PCV should be deferred until after delivery as, although is unlikely to result in adverse effects, it has not been evaluated during pregnancy	Information on vaccination in pregnancy and breast feeding added
19. Rotavirus	4	**Rotarix (RV1)** is a live monovalent attenuated human type G1P1A virus vaccine.	Rotarix (RV1) is a live monovalent attenuated human type G1P1A[8] virus vaccine.	Erratum
	6	Simultaneous Administration with other vaccines Rotavirus vaccine can be administered with all routinely recommended vaccines, any blood product and tuberculin.	Simultaneous Administration with other vaccines Rotavirus vaccine can be administered with all routinely recommended vaccines, any blood product and tuberculin. As both licensed rotavirus vaccines contain approximately 20% sucrose they should be administered just before recommended injections instead of a sucrose solution, to reduce pain.	New recommendation

20. Rubella	6	**Contraindications**	**Contraindications** 4. MMR should not be administered on the same day as yellow fever vaccine as co-administration of these two vaccines can lead to suboptimal antibody responses to yellow fever, mumps and rubella antigens. If rapid protection is required then the vaccines should be given on the same day or at any interval and an additional dose of MMR should be given.	New recommendation
	6	**Precautions** 3. Where possible, MMR should be deferred for at least 3 months after receipt of low-dose immunoglobulin, 6 months after red-cell transfusion, and 11 months after high-dose immunoglobulin (as used for e.g. Kawasaki Disease) see Chapter 2 Table 2.4.	**Precautions** 3. MMR should be deferred for at least 5 months after receipt of low-dose HNIG, 6 months after packed red-cell or whole-blood transfusion and 11 months after high-dose HNIG (as used for e.g. Kawasaki Disease) see Chapter 2 Table 2.4.	Clarification
21. Tetanus	5	Indications 1.Primary vaccination The primary course consists of 3 doses given at 2, 4 and 6 months as 6 in 1 vaccine (DTaP/IPV/Hib/Hep B).	Indications 1.Primary vaccination The primary course consists of 3 doses given at 2, 4 and 6 months as 6 in 1 vaccine (DTaP/IPV/Hib/Hep B). The 6 in 1 vaccine should be given before PCV, as it is less painful.	New recommendation
22. Tuberculosis	5	BCG vaccine may be given concurrently with another live vaccine, but if it is not given at the same time an interval of at least 4 weeks should be allowed between such vaccines. It can also be given at the same time as or at any interval before or after all inactivated vaccines.	BCG vaccine may be given at the same time as or at any interval before or after all live and non live vaccines.	See Table 2.5
23. Varicella - Zoster	6	Pregnancy should be avoided for 3 months following either dose.	Pregnancy should be avoided for 1 month following varicella vaccination	New recommendation

	8	**Indications** Zoster vaccination is not included as part of the routine immunisation schedule. However anyone aged 50 or older may choose to be immunised. Precautions Acute severe febrile illness – defer until recovery. Concomitant administration with PPV may result in reduced immunogenicity of Zostavax. However, the effectiveness of Zostavax is likely to be similar whether given with or at a different time to PPV.	**Indications** Zoster vaccination is not included as part of the routine immunisation schedule. However anyone aged 50 or older may choose to be immunised. It may be given to those who have had zoster. It is prudent to defer vaccination for 12 months after the zoster has resolved so that the vaccine can produce a more effective immune response. Precautions Acute severe febrile illness – defer until recovery. Concomitant administration with PPV may result in reduced immunogenicity of Zostavax. However, the effectiveness of Zostavax is likely to be similar whether given with or at a different time to PPV. Note: Zoster vaccine may be given to a recent receipt of an antibody containing blood product. The amount of antigen in zoster vaccine is high enough to offset any effect of circulating antibody. Also, studies of zoster vaccine were performed on patients receiving antibody-containing blood products with no appreciable effect on efficacy.	Clarification of vaccine indications post zoster
	12	There is little evidence that VZIG will prevent the congenital varicella syndrome following significant exposure of a non-immune mother in the irst 20 weeks of pregnancy	There is little evidence that VZIG will prevent the congenital varicella syndrome following significant exposure of a non-immune mother in the first 20 weeks of pregnancy	Erratum

Table 2.3 Catch-up schedule for children and adults

Vaccine	4 months to <12 months	12 months to < 4 years	4 to <10 years	10 to <18 years	18 years and older
BCG	1 dose	1 dose	1 dose	1 dose (up to15 years of age if in low risk group or up to 35 years of age if in high risk group)	
6 in 1 (DTaP/IPV/Hib/Hep B)	3 doses 2 months apart	3 doses 2 months apart	3 doses 2 months apart		
Men C	1 dose	1 dose	1 dose	1 dose (if given after 10 years of age, adolescent MenC booster not required)	1 dose (up to 23 years of age)
PCV	2 doses 2 months apart	1 dose (omit if >2 years of age[2])			
MMR[3]		1 dose	2 doses 1 month apart	2 doses 1 month apart	2 doses 1 month apart[4]
Tdap/IPV				3 doses 1 month apart	1 dose[5]
Td/IPV					2 doses 1 month apart (1 month after Tdap/IPV)
NOTE	*Continue with routine childhood immunisation schedule from 12 months.*	*Continue with routine school immunisations [4 in 1 (DTaP/IPV) at least 6 months and preferably 3 years after primary course, MMR at least 1 month after previous dose]*	*Continue with routine school immunisations [4 in 1 (DTaP/IPV) at least 6 months and preferably 3 years after primary course]*	*Booster of Tdap/IPV 5 years after primary course and Tdap 10 years later*	

[1] One dose of single Hib vaccine may be given to children over 12 months of age and up to 10 years of age if this is the only vaccine they require

[2] Unless at increased risk

[3] The second dose of MMR is recommended routinely at 4-5 years but may be administered earlier. Children vaccinated before their first birthday in the case of an outbreak should have a repeat MMR vaccination at 12 months of age, at least one month after the first vaccine with a further dose at 4-5 years of age. If a child aged <18 months receives a second MMR vaccine within 3 months of the first MMR a third MMR should be given at 4-5yrs of age.

[4] For health care workers born in Ireland since 1978 or born outside Ireland; for contacts in outbreaks born in Ireland since 1978 or born outside Ireland and for adults from low resource countries, without evidence of two doses of MMR vaccine

[5] Only one dose of Tdap/IPV is required due to likely previous exposure to pertussis infection

Table 2.5 Recommended intervals between vaccine doses

Antigen combination	Recommended interval between doses
MMR and Yellow Fever*	MMR and Yellow Fever should **not** be administered on the same day. They should be given at least 4 weeks apart
MMR and Varicella and zoster vaccine	Can be given on the same day, if not they should be given at least 4 weeks apart
BCG, rotavirus, live attenuated influenza vaccine (LAIV), MMR, oral typhoid vaccine, varicella,	**Apart from the combinations listed above,** can be given on the same day or at any time before or after each other
≥2 non-live antigens	May be administered simultaneously or at any interval between doses
Non-live and live antigens	May be administered simultaneously or at any interval between doses

***MMR and yellow fever**. If these vaccines are given at the same time there may be reduced immune responses to the mumps, rubella and yellow fever antigens so a four week interval should ideally be left between them. If protection is required rapidly the vaccines may be given at any interval and an additional dose of MMR given at least 4 weeks later

Table 2.7 Recommendations regarding preferred site and needle size for subcutaneous injections

Patient's age	Site (see illustrations below)	Needle size
Birth to < 12 months	Middle third of the anterolateral thigh	16 mm 23-25 gauge
12 to < 36 months	Middle third of the anterolateral thigh or deltoid region	16 mm 23-25 gauge
3 years and older	Deltoid region	16 mm 23-25 gauge