Table 3.3.1: Recommendations for vaccination in pregnancy (see also disease-specific chapters in Part 4)

Vaccines routinely recommended in pregnancy		
Inactivated vaccines	**Recommendation**	**Comments**
Influenza vaccine	Recommended for all pregnant women at any stage of pregnancy, particularly those who will be in the second or third trimester during the influenza season.	There is evidence from clinical trial data and observational studies that there is no increased risk of congenital defects or adverse effects in the fetuses of women who are vaccinated against influenza in pregnancy. Influenza immunisation protects the mother, as pregnancy increases her risk of severe influenza, and also protects her newborn baby in the first few months after birth (refer to 4.7 *Influenza*).
Diphtheria-, tetanus-, and pertussis-containing vaccines (dTpa)	dTpa recommended as a single dose during the third trimester of each pregnancy (28–32 weeks)	Pertussis vaccination during the third trimester of pregnancy has been shown to be more effective in reducing the risk of infant pertussis than maternal vaccination post partum.[15,16] Studies have found no evidence of an increased risk of adverse pregnancy outcomes related to pertussis vaccination during pregnancy.[17-22] (Refer to 4.12 *Pertussis* for more details.)
Vaccines not *routinely* recommended in pregnancy		
Inactivated bacterial vaccines	**Recommendation**	**Comments**
Diphtheria-tetanus vaccine (dT)	Not routinely recommended Can be given under certain circumstances, such as for management of a tetanus-prone wound	Tetanus- and diphtheria-containing vaccines have been used extensively in pregnant women, with no increased risk of congenital abnormalities in fetuses of women who were vaccinated during pregnancy.[23-25] (Refer to 4.2 *Diphtheria* and 4.19 *Tetanus* for more details.)
Cholera (oral) vaccine	Not routinely recommended	There are limited data on the safety of oral cholera vaccine in pregnancy.[26]
Haemophilus influenzae type b (Hib) vaccine	Not routinely recommended Can be given to pregnant women at increased risk of Hib disease (e.g. with asplenia)	Limited available data suggest that it is unlikely that use of Hib vaccine in pregnant women has any deleterious effects on pregnancy outcomes.[27]

Source: Australian Technical Advisory Group on Immunisation. *The Australian Immunisation Handbook*. 10th ed (2016 update). Canberra: Australian Government Department of Health; 2016. http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/Handbook10-home

Table 3.3.1 (continued)

Vaccines not *routinely* recommended in pregnancy (cont'd)		
Inactivated bacterial vaccines (cont'd)	**Recommendation**	**Comments**
Meningococcal conjugate vaccines (MenCCV, Hib-MenCCV or 4vMenCV)	Not routinely recommended Can be given to pregnant women at increased risk of meningococcal disease (refer to 4.10 *Meningococcal disease*)	There are limited data on the safety of meningococcal conjugate vaccines in pregnancy.[28] Where clinically indicated, meningococcal conjugate vaccine (MenCCV or 4vMenCV) can be given to pregnant women.[29] Hib-MenCCV is not indicated for use in adolescents or adults.
Meningococcal polysaccharide vaccine (4vMenPV)	Not routinely recommended Can be given to pregnant women at increased risk of meningococcal disease (refer to 4.10 *Meningococcal disease*)	Limited available data suggest that it is unlikely that use of meningococcal polysaccharide vaccine in pregnant women has any deleterious effects on pregnancy outcomes.[30,31] Where clinically indicated, meningococcal polysaccharide vaccine can be given to pregnant women, although 4vMenCV is preferred.[29]
Meningococcal B vaccine (MenBV)	Not routinely recommended Can be given to pregnant women at increased risk of meningococcal disease (refer to 4.10 *Meningococcal disease*)	No data are available. Vaccination during pregnancy has not been evaluated, although is unlikely to result in adverse effects.
13-valent pneumococcal conjugate vaccine (13vPCV)	Not routinely recommended Can be given to pregnant women at the highest increased risk of invasive pneumococcal disease (IPD) (e.g. with asplenia, immunocompromise, cerebrospinal fluid leak) (refer to 4.13 *Pneumococcal disease*)	No data are available. Vaccination during pregnancy has not been evaluated, although is unlikely to result in adverse effects. Women of child-bearing age with known risk factors for IPD (including smokers) should ideally be vaccinated before pregnancy or as soon as practicable after delivery (refer to 4.13 *Pneumococcal disease*).
23-valent pneumococcal polysaccharide vaccine (23vPPV)	Not routinely recommended Can be given to pregnant women at the highest increased risk of invasive pneumococcal disease (IPD) (e.g. with asplenia, immunocompromise, cerebrospinal fluid leak) (refer to 4.13 *Pneumococcal disease*)	23vPPV has been administered in pregnancy in the context of clinical trials[32] with no evidence of adverse effects; however, data are limited. Women of child-bearing age with known risk factors for IPD (including smokers) should ideally be vaccinated before pregnancy or as soon as practicable after delivery (refer to 4.13 *Pneumococcal disease*).
Q fever vaccine	Not routinely recommended	Safe use in pregnancy has not been established.
Typhoid Vi polysaccharide vaccine	Not routinely recommended Can be given to pregnant women travelling to endemic countries where water quality and sanitation is poor	No data are available.[33] Vaccination during pregnancy has not been directly evaluated, although is unlikely to result in adverse effects.

Table 3.3.1 (continued)

Vaccines not *routinely* recommended in pregnancy (cont'd)		
Inactivated viral vaccines	**Recommendation**	**Comments**
Hepatitis A vaccine	Not routinely recommended Can be given to susceptible pregnant women travelling to areas of moderate to high endemicity or those who are at increased risk of exposure through lifestyle factors, or where severe outcomes may be expected (e.g. pre-existing liver disease)	Limited data are available. Hepatitis A vaccine should only be given to pregnant women who are non-immune and at increased risk for hepatitis A.[34]
Hepatitis B vaccine	Not routinely recommended Can be given to susceptible pregnant women for whom this vaccine would otherwise be recommended, for example, as post-exposure prophylaxis in a non-immune pregnant woman with a significant exposure to a HBsAg-positive source	Limited data are available. Hepatitis B vaccine should only be given to pregnant women who are non-immune and at increased risk for hepatitis B.[35]
Japanese encephalitis (JE) vaccine (JEspect)	Not routinely recommended Can be given to pregnant women at high risk of acquiring JE	Limited data are available. JE infection is associated with miscarriage, and women who are at high risk of JE should be assessed for the need for vaccination. Where the risk of JE disease is high, pregnant women should be vaccinated using the inactivated vaccine, JEspect (not Imojev, which is a live attenuated vaccine).[36]
Poliomyelitis vaccine (IPV)	Not routinely recommended Can be given to pregnant women at high risk of poliovirus exposure (e.g. travel to endemic countries)	Limited available data suggest that it is unlikely that use of inactivated poliomyelitis vaccine in pregnant women has any deleterious effects on pregnancy outcomes.[33] IPV should only be given to pregnant women when clearly indicated.
Rabies vaccine	Can be given to pregnant women for whom this vaccine would otherwise be recommended (e.g. post-exposure prophylaxis).	Limited available data suggest that it is unlikely that the use of rabies vaccine in pregnant women has any deleterious effects on pregnancy outcomes.[37-40] Pregnancy is never a contraindication to rabies vaccination in situations where there is a significant risk of exposure (related to occupation or travel), or where there has been a potential exposure to rabies virus, Australian bat lyssavirus or another bat lyssavirus.[41,42]
Vaccines not recommended in pregnancy		
Inactivated viral vaccines	**Recommendation**	**Comments**
Human papillomavirus (HPV) vaccine	Not recommended	Although HPV vaccination is not recommended during pregnancy, evidence from clinical trials and limited data from observational studies where HPV vaccine was inadvertently administered during pregnancy, indicate that there is no increased risk of adverse effects on the fetus.[43] In the event of pregnancy, completion of a 3-dose course of vaccination should be deferred until after delivery.

Table 3.3.1 (continued)

Vaccines not recommended in pregnancy (cont'd)		
Live attenuated viral vaccines	**Recommendation**	**Comments**
Yellow fever vaccine	Not recommended	Pregnant women should be advised against going to the rural areas of yellow fever endemic areas. However, where travel to an at-risk country is unavoidable, such women should be vaccinated.[44,45] Yellow fever vaccine has been given to a large number of pregnant women with no adverse outcomes.[46]
Vaccines contraindicated in pregnancy		
Live attenuated bacterial vaccines	**Recommendation**	**Comments**
BCG vaccine	Contraindicated	There is only a hypothetical risk. BCG vaccine has not been shown to cause fetal damage.[47]
Oral typhoid vaccine	Contraindicated	There are limited data available (animal studies), suggesting no increased occurrence of fetal damage with oral live attenuated vaccine.[48] Inactivated typhoid Vi polysaccharide vaccine is preferred (refer above).
Live attenuated viral vaccines	**Recommendation**	**Comments**
Japanese encephalitis (JE) vaccine (Imojev)	Contraindicated	There is only a hypothetical risk. There are currently no data available regarding the use of this vaccine in pregnant or breastfeeding women. Women of child-bearing age should avoid pregnancy for 28 days after vaccination.
Measles-mumps-rubella (MMR) vaccine or Measles-mumps-rubella-varicella (MMRV) vaccine	Contraindicated	There is only a hypothetical risk. Despite concerns that live attenuated rubella vaccine virus might cause congenital abnormalities, rubella vaccine (either monovalent or as MMR) has been given to pregnant women (usually inadvertently) without harm to the fetus.[49,50] Even though rubella vaccine virus can infect the fetus, even for vaccine given in early pregnancy, there is no evidence that it causes congenital rubella syndrome in infants born to susceptible mothers.[51] Receipt of rubella vaccination during pregnancy is not an indication for termination.[50] Women of child-bearing age should avoid pregnancy for 28 days after vaccination. It is recommended practice to test all pregnant women for immunity to rubella, and to vaccinate susceptible women as soon as possible after delivery and check their serological status post vaccination.

Table 3.3.1 (continued)

Vaccines contraindicated in pregnancy (cont'd)		
Live attenuated viral vaccines (cont'd)	**Recommendation**	**Comments**
Rotavirus vaccine	Contraindicated	Rotavirus vaccines are not registered or recommended for use in adolescents or adults.
Varicella vaccine	Contraindicated	There is only a hypothetical risk. Congenital varicella syndrome has not been identified in women who have been inadvertently vaccinated with varicella vaccine in early pregnancy.[52] Women of child-bearing age should avoid pregnancy for 28 days after vaccination.
Zoster vaccine	Contraindicated	There is only a hypothetical risk. Women of child-bearing age are unlikely to be eligible for vaccination, as zoster vaccine is registered for use in persons ≥50 years of age. If women of child-bearing age have inadvertently been vaccinated, they should avoid pregnancy for 28 days after vaccination.
Immunoglobulins for use as pre- or post-exposure prophylaxis		
Pooled or hyperimmune immunoglobulins	Not routinely recommended Can be used post exposure in susceptible pregnant women exposed to: measles, hepatitis A, hepatitis B, rabies, Australian bat lyssavirus, or varicella viruses, or tetanus	Limited data are available. There is no known risk to the fetus from passive immunisation of pregnant women with immunoglobulins. For more details, refer to Part 5 *Passive immunisation* and relevant disease-specific chapters in Part 4.