4.18 RUBELLA

4.18.1 Virology

Rubella is an enveloped togavirus, genus Rubivirus. The virus has an RNA genome and is closely related to group A arboviruses, but does not require a vector for transmission. It is relatively unstable, and is inactivated by lipid solvents, trypsin, formalin, extremes of heat and pH, and light.1

4.18.2 Clinical features

Rubella is generally a mild and self-limiting infectious disease, spread from person to person by respiratory secretions, possibly including aerosol transmission.1,2 It causes a transient, generalised, erythematous, maculopapular rash; lymphadenopathy involving the post-auricular and sub-occipital glands; and, occasionally, arthritis and arthralgia. Other complications, such as neurological disorders and thrombocytopenia, may occur but are rare. Clinical diagnosis is unreliable since the symptoms are often fleeting and can be caused by other viruses; in particular, the rash is not unique to rubella and may be absent.1,2 Up to 50% of rubella virus infections are subclinical or asymptomatic.1 A history of rubella should, therefore, not be accepted without serological evidence of previous infection.1 The incubation period is 14 to 21 days, and the period of infectivity is from 1 week before until 4 days after the onset of the rash.2

Rubella infection in pregnancy can result in fetal infection, causing congenital rubella syndrome (CRS) in a high proportion of cases. Up to 90% of infants born to women who had rubella infection in the first trimester of pregnancy have abnormalities (often multiple) characteristic of CRS.1,2,3 The risk of damage declines to 10 to 20% by 16 weeks gestation. After this stage of pregnancy, fetal damage is rare but has been reported up to 20 weeks gestation.4 The characteristics of CRS include intellectual disabilities, cataracts, deafness, cardiac abnormalities, intrauterine growth retardation, and inflammatory lesions of the brain, liver, lungs and bone marrow.3 Any combination of these defects may occur, but defects that commonly occur alone following infection after the first 8 weeks of pregnancy are deafness and pigmentary retinopathy. Some infected infants may appear normal at birth, but defects, especially sensorineural deafness, may be detected later.6

Rubella infection has been reported in some persons who already have either natural or vaccine-induced antibody.3 Occasional cases of CRS after reinfection in pregnancy have been documented. However, fetal damage is very rare in cases of infection in women in whom antibody has previously been detected.3,5,6

4.18.3 Epidemiology

Evidence suggests that endemic rubella is well controlled in Australia.10 The incidence of rubella has fallen rapidly since vaccine registration, and notifications of rubella have been low since high vaccine coverage was achieved with the National Measles Control Campaign in late 1998 and then maintained.10 Since 2003, rubella notifications in Australia have been less than 0.3 per 100,000. There has been a shift in the age distribution of cases, with comparatively more cases seen in older age groups, particularly the 25–29 years age group.10

Rubella vaccines have been registered in Australia since 1970, and mass vaccination of schoolgirls commenced in 1971.11,12 Non-pregnant, seronegative adult women were also vaccinated. These programs were successful and there was a significant reduction in the incidence of CRS from 1977.12–14 Successful vaccination campaigns and high vaccination coverage resulted in no cases of congenital rubella syndrome occurring in infants of Australian-born mothers between 1998 and 2002. However, 5 cases resulting from infection acquired outside of Australia were reported during this time.15 In 2003, 2 cases of CRS occurred in Australian-born mothers from infection that occurred in Australia,16 which reinforces the need for high vaccination coverage of women of child-bearing age. Between 2004 and 2008, 2 confirmed cases of CRS were reported in Australia, in children whose mothers were born outside Australia.17–19

There has also been a significant increase in the percentage of pregnant women immune to rubella (e.g. in New South Wales from 82% in 1971 to 96% in 1983).20 Based on a study conducted in Melbourne in 2000, it was estimated that only 2.5% of women of child-bearing age in Australia were seronegative.21 However, susceptibility was higher among certain groups of women, particularly overseas-born women (refer to ‘Women of child-bearing age, including post-partum women’ in 4.18.7 Recommendations below).21

Young adult males may not be immune to rubella, because they did not receive a measles-mumps-rubella (MMR) vaccine.22 The MMR vaccination program for all adolescents replaced the rubella program for girls in 1993/94.21 A serosurvey conducted in 1999 showed that only 84% of males aged 14–18 years (compared to 95% of females) and 89% of males aged 19–49 years (compared to 98% of females) were immune to rubella.22 For this reason, young adult males, as well as females, who do not have a documented history of receipt of 2 doses of MMR vaccine should be vaccinated (refer to 4.18.7 Recommendations below). This is both for their own protection and to prevent transmission of the infection in the community.

Goals for the elimination of rubella and CRS have been set by a number of World Health Organization (WHO) regions, and elimination has been declared by the Pan American Health Organization.23 The WHO Western Pacific Region has set goals for increased rubella and CRS control efforts, with a number of member states yet to incorporate rubella
vaccination into their routine schedule.24 As with elimination of measles, rubella and CRS elimination requires continued strengthening of immunisation and surveillance efforts, particularly identification of rubella virus genotypes to confirm the absence of an endemic strain.25

4.18.4 Vaccines

Monovalent rubella vaccine is not available in Australia. Rubella vaccination is provided using either MMR or measles-mumps-rubella- varicella (MMRV) vaccines. Two combination vaccines containing live attenuated measles, mumps, rubella and varicella viruses (MMRV) are registered in Australia.

A single dose of rubella vaccine produces an antibody response in over 95% of vaccine recipients, but antibody levels are lower than after natural infection.3,7,8 A 2nd dose aims to confer immunity in those who fail to seroconvert to the 1st dose. Vaccine-induced antibodies have been shown to persist for at least 16 years in the absence of endemic disease.3,8,26,27 Protection against clinical rubella appears to be long-term in those who seroconvert.9

Combination MMRV vaccines have been shown, in clinical trials, to produce similar rates of seroconversion to all four vaccine components compared with MMR and monovalent varicella vaccines administered concomitantly at separate injection sites.28-31

### Combination measles–mumps–rubella (MMR) vaccines

- **M-M-R II** – bioCSL Pty Ltd (live attenuated measles virus [Enders’ attenuated Edmonston strain], mumps virus [Jeryl Lynn B level strain] and rubella virus [Wistar RA 27/3 strain]). Lyophilised pellet in a monodose vial with separate diluent. Each 0.5 mL reconstituted dose contains ≥1000 tissue culture infectious dose 50% (TCID₅₀) of measles virus, ≥12 500 TCID₅₀ of mumps virus, and ≥1000 TCID₅₀ of rubella virus; 14.5 mg sorbitol; 1.9 mg sucrose; 14.5 mg hydrolysed porcine gelatin; ≤0.3 mg recombinant human albumin; <1 ppm fetal bovine serum; 25 µg neomycin.

- **Priorix** – GlaxoSmithKline Australia Pty Ltd (live attenuated measles virus [Schwarz strain], mumps virus [RIT 4385 strain, derived from the Jeryl Lynn strain] and rubella virus [Wistar RA 27/3 strain]). Lyophilised pellet in a monodose vial with a pre-filled diluent syringe. Each 0.5 mL reconstituted dose contains ≥10¹⁰ cell culture infectious dose 50% (CCID₅₀) of measles virus, ≥10¹² CCID₅₀ of mumps virus, and ≥10¹⁰ CCID₅₀ of rubella virus; lactose; neomycin; sorbitol; mannitol.

### Combination measles-mumps-rubella-varicella (MMRV) vaccines

- **Priorix-tetra** – GlaxoSmithKline Australia Pty Ltd (live attenuated measles virus [Schwarz strain], mumps virus [RIT 4385 strain, derived from the Jeryl Lynn strain], rubella virus [Wistar RA 27/3 strain and varicella-zoster virus [Oka strain]]). Lyophilised powder in a monodose vial with a pre-filled diluent syringe. Each 0.5 mL reconstituted dose contains ≥10¹⁰ CCID₅₀ of measles virus, ≥10³ PFU of varicella-zoster virus; lactose; neomycin; sorbitol; mannitol.

- **ProQuad** – bioCSL Pty Ltd (live attenuated measles virus [Enders’ attenuated Edmonston strain], mumps virus [Jeryl Lynn B level strain], rubella virus [Wistar RA 27/3 strain] and varicella-zoster virus [Oka/Merck strain]). Lyophilised powder in a monodose vial with a pre-filled diluent syringe. Each 0.5 mL reconstituted dose contains ≥10¹⁰ TCID₅₀ of measles virus, ≥10¹⁰ TCID₅₀ of mumps virus, ≥10¹⁰ TCID₅₀ of rubella virus, and ≥10⁹ PFU of varicella-zoster virus; 20 mg sucrose; 11 mg hydrolysed porcine gelatin; 2.5 mg urea; 16 mg sorbitol; 0.38 mg monosodium L-glutamate; 0.25 mg recombinant human albumin; 5 µg neomycin; residual components of MRC-5 cells; 0.5 µg bovine serum albumin.

4.18.5 Transport, storage and handling

Transport according to **National vaccine storage guidelines: Strive for 5.**32 Store at +2°C to +8°C. Do not freeze. Protect from light.

Both MMR and MMRV vaccines must be reconstituted by adding the entire contents of the diluent container to the vial containing the pellet and shaking until the pellet is completely dissolved.

Reconstituted Priorix (MMR), M-M-R II (MMR) and Priorix-tetra (MMRV) vaccines should be used as soon as practicable. If storage is necessary, hold at +2°C to +8°C for not more than 8 hours.

Reconstituted ProQuad (MMRV) vaccine should be used immediately. If storage is necessary, hold at +2°C to +8°C for not more than 2.5 hours or at +20°C to +25°C for not more than 1 hour.

4.18.6 Dosage and administration

The dose of Priorix (MMR) vaccine for both children and adults is 0.5 mL, to be given by either SC or IM injection.

The dose of M-M-R II (MMR) vaccine for both children and adults is 0.5 mL, to be given by SC injection.

For children <14 years of age, the dose of MMRV vaccine is 0.5 mL, to be given by SC injection. Priorix-tetra may also be given by IM injection. 33

MMRV vaccines are not recommended for use in persons aged ≥14 years.

When 2 doses of MMR-containing vaccine are required, the minimum interval between doses is 4 weeks.

Co-administration with other vaccines

MMR or MMRV vaccines can be given at the same time as other live attenuated parenteral vaccines (e.g. varicella, BCG, yellow fever) or other inactivated vaccines (including DTPa, hepatitis B, Hib, IPV, MenCCV, hepatitis A and pneumococcal conjugate vaccine), 33 using separate syringes and injection sites. If MMR or MMRV vaccine is not given simultaneously with other live attenuated parenteral vaccines, they should be given at least 4 weeks apart.

If MMR vaccine is given at the same time as monovalent varicella vaccine (VV), they should be given using separate syringes and injection sites. MMR vaccine and monovalent VV should not be mixed together prior to injection.

Separate administration of measles, mumps or rubella vaccine is not available as an alternative to MMR vaccine, although a monovalent varicella vaccine is available (refer to 4.22 Varicella).

Interchangeability of MMR-containing vaccines

In general, the two brands of MMR vaccine can be considered interchangeable, that is, the 2nd MMR dose does not have to be of the same brand as the 1st. The same principle applies to the two available MMRV vaccines, 36 although they are not routinely recommended in a 2-dose schedule.

4.18.7 Recommendations

For further information on the recommendations for MMR and MMRV vaccines, refer to 4.9 Measles and 4.22 Varicella.

The principal aim of rubella vaccination is to prevent congenital rubella syndrome by stopping the circulation of rubella virus in the community. Susceptible pregnant women will continue to be at risk of rubella infection in pregnancy until the transmission of rubella virus is interrupted by continued high-level coverage of rubella-containing vaccine.

A history of rubella is not a contraindication to vaccination. Persons who are already immune to rubella have no increased risk of side effects from vaccination. 3,7

Infants aged <12 months

MMR-containing vaccines are not routinely recommended for infants <12 months of age. However, MMR vaccine can be given to children from as early as 9 months of age in high-risk circumstances (refer to 4.9 Measles).

If MMR vaccine is given at <12 months of age, there is still a need for 2 vaccine doses to be administered at ≥12 months of age (refer to 4.9 Measles).

Children

Two doses of rubella-containing vaccine are recommended for all children. The 1st dose should be given at 12 months of age as MMR vaccine. MMRV vaccines are not recommended for use as the 1st dose of MMR-containing vaccine in children <4 years of age, due to a small but increased risk of fever and febrile seizures when given as the 1st MMR-containing vaccine dose in this age group (refer to Table 4.9.1 in 4.9 Measles and Table 4.22.1 in 4.22 Varicella). (Refer also to 4.9.11 Adverse events in 4.9 Measles and 4.22.11 Adverse events in 4.22 Varicella.)

The 2nd dose of rubella-containing vaccine is recommended to be given routinely at 18 months of age as MMR vaccine. This is to commence from July 2013 once MMRV vaccine(s) are available under the NIP (refer to Table 4.9.1 in 4.9 Measles and Table 4.22.1 in 4.22 Varicella). The recommended age for administration of the 2nd dose of rubella-containing vaccine will be moved down from 4 years of age, to provide earlier 2-dose protection against measles, mumps and rubella, and to improve vaccine uptake (refer to 4.18.3 Epidemiology above).

If MMRV vaccine is inadvertently administered as dose 1 of MMR-containing vaccine, the dose does not need to be repeated (providing it was given at ≥12 months of age); however, parents/carers should be advised regarding the small but increased risk of fever and febrile seizures (compared with that expected following MMR vaccine).

Adults and adolescents

Two doses of rubella-containing vaccine are recommended for all non-immune adolescents and adults (refer to 4.9 Measles). All persons born during or since 1966 who are ≥18 months of age (or, until catch-up following the move of the 2nd NIP dose of measles-containing vaccine to 18 months of age is completed, are ≥4 years of age) should have documented evidence of 2 doses of MMR-containing vaccine (administered at least 4 weeks apart with both doses administered at ≥12 months of age) or have serological evidence of protection for measles, mumps and rubella.
It is particularly important to ensure that women of child-bearing age are immune to rubella (refer to ‘Women of child-bearing age, including post-partum women’ below).

It is recommended that all males born during or after 1966 (particularly those born from 1966 up to the 1990s) have their vaccination records reviewed to ensure they have received 2 doses of MMR vaccine, as they are more likely, than females, to have not received 2 doses of rubella-containing vaccine (refer to 4.18.3 Epidemiology above).

MMRV vaccines are not recommended for use in persons ≥14 years of age, due to a lack of data on safety and immunogenicity/efficacy in this age group. If a dose of MMRV vaccine is inadvertently given to an older person, this dose does not need to be repeated.

**Healthcare workers and those who work with children**

All healthcare workers and persons working with children, born during or since 1966, either without vaccination records or seronegative upon screening, should receive 2 doses of MMR vaccine, both for their own protection and to avoid the risk of transmitting rubella to pregnant women12,13,27,36-38 (refer to 3.3 Groups with special vaccination requirements, Table 3.3.7 Recommended vaccinations for persons at increased risk of certain occupationally acquired vaccine-preventable diseases).

**Women of child-bearing age, including post-partum women**

Every effort should be made to identify and immunise non-pregnant seronegative women of child-bearing age (refer to ‘Serological testing for immunity to rubella’ below). The following women are more likely to be seronegative to rubella: women born overseas (especially in Asia, Pacific islands, sub-Saharan Africa and South America) who entered Australia after the age of routine vaccination; Indigenous women living in rural and remote regions; non-English speaking women; women over the age of 35 years; and Australian-born Muslim women.12,13,27,36-38

Seronegative women should be given MMR vaccine and advised to avoid pregnancy for 28 days after vaccination. Vaccinated women should be tested for seroconversion 6 to 8 weeks after vaccination (refer to ‘Serological testing for immunity to rubella’ below). Women who have negative or very low antibody levels after vaccination should be revaccinated. However, if antibody levels remain low after a 2nd documented vaccination, it is unlikely that further vaccinations will improve this.4 Further testing and vaccination is not usually warranted; however, consultation with the laboratory that performed the serological testing may also be helpful (refer also to ‘Serological testing for immunity to rubella’ below). Negative serology after 2 documented doses of rubella-containing vaccine may represent a false negative (i.e. an antibody titre too low to be detected using routine commercial assays).

Although 2 doses of MMR vaccine are routinely recommended, if rubella immunity is demonstrated after receipt of 1 dose of a rubella-containing vaccine, no further dose is required, unless indicated by subsequent serological testing (refer to ‘Serological testing for immunity to rubella’ below) or if indicated for protection against measles and mumps (refer to 4.9 Measles and 4.11 Mumps).

Women found to be seronegative on antenatal testing for rubella immunity should be vaccinated after delivery and before discharge from the maternity unit, as discussed above. These women should be tested for rubella immunity 6 to 8 weeks following vaccination.1,7 (Refer also to ‘Serological testing for immunity to rubella’ below.)

**Serological testing for immunity to rubella**

Serological testing for immunity to rubella after routine vaccination of children is not recommended. However, serological testing for rubella immunity can be performed in cases where a history of natural immunity or 2 doses of vaccine administration is uncertain. It is particularly important to ensure that women of child-bearing age are immune to rubella (refer to ‘Women of child-bearing age, including post-partum women’ above).

A number of commercial assays for testing immunity to rubella are available. These vary according to the method used to determine the positive cut-off value (the WHO cut-off is 10 IU/mL, but, at present, there is no recommended Australian minimal level). Available data support the presumption that an antibody level found by use of a licensed assay to be above the standard positive cut-off for that assay can be considered evidence of past exposure to rubella virus.3 Rubella vaccine induces immune responses that are similar in quality, but lesser in quantity, than those after natural disease.2 Measurement of antibody by commercial assays is not a perfect correlate of protection in vaccinated persons.2 While on the one hand, those with low levels of vaccine-induced antibodies are often protected, conversely, reinfection may take place in some individuals with measurable antibodies. If a person is found to be rubella IgG seronegative, vaccination should be provided according to the recommendations above. Interpretation of the results of serological testing may be enhanced by discussion with the laboratory that performed the test, ensuring that relevant clinical information is provided. In addition, expert consultation and referral of sera to a reference laboratory are recommended if there is difficulty interpreting results, particularly for women of child-bearing age (refer to ‘Women of child-bearing age, including post-partum women’ above).

All women of child-bearing age should be advised by a medical practitioner of the result of their antibody test, as it is a clinically significant test.9 Women should be screened for rubella antibodies shortly before every pregnancy, or early in the pregnancy, or if pregnancy is contemplated, irrespective of a previous positive rubella antibody result.3,14 Very
occasionally, errors may result in patients who are seronegative being reported as seropositive. Specimens from pregnant women are required to be stored until the completion of the pregnancy for parallel serological testing if required.40

4.18.8 Pregnancy and breastfeeding

Rubella-containing vaccines are contraindicated in pregnant women (refer to 4.18.9 Contraindications below). Pregnancy should be avoided for 28 days after vaccination.41

MMR vaccines can be given to breastfeeding women. The rubella vaccine virus may be secreted in human breast milk, and rare cases of transmission of vaccine virus through breast milk have been reported. However, symptoms in the newborn have been absent or mild.42–44 Post-partum vaccination of women without evidence of rubella immunity need not be delayed because of breastfeeding.

MMR vaccines are not recommended for use in persons aged ≥14 years.

There is no risk to pregnant women from contact with recently vaccinated persons. The vaccine virus is not transmitted from vaccinated persons to susceptible contacts.5

Refer to 3.3 Groups with special vaccination requirements, Table 3.3.1 Recommendations for vaccination in pregnancy for more information.

4.18.9 Contraindications

Anaphylaxis to vaccine components

MMR and MMRV vaccines are contraindicated in persons who have had:

- anaphylaxis following a previous dose of any MMR-containing vaccine
- anaphylaxis following any vaccine component.

Persons who are immunocompromised

Measles-, mumps-, and rubella-containing vaccines contain live attenuated vaccine viruses and are contraindicated in persons who are immunocompromised. Thus, MMR-containing vaccines are contraindicated in the following groups:

- Persons immunocompromised due to HIV/AIDS. MMR vaccination of asymptomatic HIV-infected persons >12 months of age with an age-specific CD4+ count of ≥15% may be considered (refer to ‘HIV-infected persons’ in 3.3.3 Vaccination of immunocompromised persons). Since studies have not been performed using combination MMRV vaccines in asymptomatic HIV-infected persons or persons with an age-specific CD4+ count of ≥15%, it is recommended that only MMR vaccine (and monovalent VV, refer to 4.22 Varicella) be considered for use in this setting.47,49,51

- Persons with other medical conditions associated with significant immunocompromise (refer to 3.3.3 Vaccination of immunocompromised persons)

- Persons receiving high-dose systemic immunosuppressive therapy, such as chemotherapy, radiation therapy or oral corticosteroids. MMR-containing vaccines are contraindicated in persons taking high-dose oral corticosteroids for more than 1 week (in children equivalent to >2 mg/kg per day prednisolone, and in adults >60 mg per day) (refer to 3.3.3 Vaccination of immunocompromised persons). Those who have been receiving high-dose systemic steroids for more than 1 week may be vaccinated with live attenuated vaccines after corticosteroid therapy has been discontinued for at least 1 month52 (refer to 3.3.3 Vaccination of immunocompromised persons).

Refer also to 3.3 Groups with special vaccination requirements and 4.22 Varicella for more information.

Pregnant women

Refer also to 4.18.8 Pregnancy and breastfeeding above.

Rubella-containing vaccines are contraindicated in pregnant women.

This is due to the theoretical risk of transmission of the rubella component of the vaccine to a susceptible fetus. However, no evidence of vaccine-induced CRS has been reported.1 Active surveillance in the United States, the United Kingdom and Germany indicates that no case of vaccine-induced congenital rubella syndrome occurred among more than 500 women inadvertently vaccinated with rubella vaccine during pregnancy, whose pregnancies continued.53 In an Iranian study performed after mass vaccination with a measles–rubella vaccine, 117 susceptible women were inadvertently vaccinated while pregnant or became pregnant within 3 months after vaccination. There were no CRS-related abnormalities among the infants born to these women.44 Based on this evidence, the vaccine cannot be considered to be teratogenic, and termination of pregnancy following inadvertent vaccination is not indicated.1,3 (Refer also to 3.3.2 Vaccination of women who are planning pregnancy, pregnant or breastfeeding, and preterm infants.)

4.18.10 Precautions
For additional precautions related to MMR and MMRV vaccines, refer to 4.9 Measles and 4.22 Varicella.

Vaccination with other live attenuated parenteral vaccines
If MMR or MMRV vaccine is not given simultaneously with other live attenuated parenteral vaccines (e.g. varicella, BCG, yellow fever), the vaccines should be given at least 4 weeks apart.

Vaccination after immunoglobulin or blood product administration
Administration of a MMR or MMRV vaccine should be delayed after administration of immunoglobulin-containing products. After receipt of immunoglobulin-containing blood products, the expected immune response to measles, mumps, rubella and varicella vaccination may be impaired.1,3,5,6 MMR-containing vaccines should not be given for between 3 and 11 months following the administration of immunoglobulin-containing blood products. The interval between receipt of the blood product and vaccination depends on the amount of immunoglobulin in each product, and is indicated in 3.3 Groups with special vaccination requirements, Table 3.3.6 Recommended intervals between either immunoglobulins or blood products and MMR, MMRV or varicella vaccination.55 For further information, refer to 3.3.4 Vaccination of recent recipients of normal human immunoglobulin and other blood products.

Recent blood transfusion with washed red blood cells is not a contraindication to MMR or MMRV vaccines.

MMR vaccine may be administered concomitantly with, or at any time in relation to, anti-D immunoglobulin, but at a separate injection site. Anti-D immunoglobulin does not interfere with the antibody response to vaccine.1,3,8

Immunoglobulin or blood product administration after vaccination
Immunoglobulin-containing products should not be administered for 3 weeks following vaccination with rubella-containing vaccines, unless the benefits exceed those of vaccination. If immunoglobulin-containing products are administered within this interval, the vaccinated person should either be revaccinated later at the appropriate time following the product (as indicated in Table 3.3.6), or be tested for immunity 6 months later and then revaccinated if seronegative.

Rh (D) immunoglobulin (anti-D) may be given at the same time in different sites with separate syringes or at any time in relation to MMR vaccine, as it does not interfere with the antibody response to the vaccine.

4.18.11 Adverse events
Adverse events following administration of MMR-containing vaccines are generally mild and well tolerated.3 Adverse events are much less common after the 2nd dose of MMR or MMRV vaccine than after the 1st dose.

Mild adverse events such as fever, sore throat, lymphadenopathy, rash, arthralgia and arthritis may occur following MMR vaccination.1,7 Symptoms most often begin 1 to 3 weeks after vaccination and are usually transient.

Thrombocytopenia (usually self-limiting) has been very rarely associated with the rubella or measles component of MMR vaccine occurring in 3 to 5 per 100 000 doses of MMR vaccine administered.3,57-59 This is considerably less frequent than after natural measles, mumps and rubella infections.59

Persons with egg allergy can be safely given MMR or MMRV vaccine (refer to 4.9.11 Adverse events in 4.9 Measles).

For further information on adverse events related to MMR and MMRV vaccines, refer to 4.9 Measles and 4.22 Varicella.

4.18.12 Public health management of rubella
Rubella is a notifiable disease in all states and territories in Australia.

Further instructions about the public health management of rubella, including management of cases of rubella and their contacts, should be obtained from state/territory public health authorities (refer to Appendix 1 Contact details for Australian, state and territory government health authorities and communicable disease control).

Rubella-containing vaccine does not provide protection if given after exposure to rubella.7 However, if the exposure did not result in infection, the vaccine would induce protection against subsequent infection. Normal human immunoglobulin (NHIG) has been shown not to be of value in post-exposure prophylaxis for rubella.7 However, NHIG may be recommended in certain circumstances (refer to ‘Use of normal human immunoglobulin in pregnant women exposed to rubella’ below).

Suspected rubella contacts
All contacts of persons with suspected rubella infection should be identified, especially those who are pregnant (refer to ‘Pregnant women with suspected rubella or exposure to rubella’ below).
Contacts >12 months of age without adequate proof of immunity should receive 1 dose of MMR vaccine (or MMRV vaccine, if appropriate). This will not prevent rubella disease if already exposed. If vaccination is refused, the contact should avoid further contact with cases until at least 4 days after onset of the rash in the case. Seronegative women of child-bearing age should be vaccinated and tested for seroconversion 6 to 8 weeks after vaccination (refer to 4.18.7 Recommendations above).

Exposed healthcare workers without adequate proof of immunity should be excluded from work for 21 days from exposure or for at least 4 days after the onset of rash.60

Testing for rubella infection
All cases of suspected rubella infection should be laboratory tested and false positive results excluded (refer to ‘Sero logical testing for immunity to rubella’ in 4.18.7 Recommendations above).
Acute rubella infection is indicated by the presence of rubella IgM or a 4-fold or greater increase in rubella IgG. Rubella IgM may not appear until a week after clinical symptoms. Sera for testing should be taken 7 to 10 days after onset of illness and repeated 2 to 3 weeks later. The most recent date of potential exposure should be obtained, if possible, to calculate the potential incubation period. As some patients may have more than one exposure to a person with a rubella-like illness, and because exposure may occur over a prolonged period, it is important to ascertain the dates of the first and last exposures.60 Testing for infection can also be done, particularly early in the course of a clinical illness, using virus-detection methods, such as nucleic acid amplification testing (PCR).60

Infected persons should be excluded from school/work/institution and should avoid contact with women of child-bearing age for at least 4 days after the onset of the rash.60

Pregnant women with suspected rubella or exposure to rubella
All pregnant women with suspected rubella or exposure to rubella should be serologically tested (for IgM and IgG), irrespective of a history of prior vaccination, clinical rubella or a previous positive rubella antibody result (for more details, refer to ‘Testing for rubella infection’ above). Testing is essential because of the serious consequences of the infection, the rash of rubella is not diagnostic, asymptomatic infection can occur, and the diagnosis requires confirmation by laboratory tests.3,58 In addition, infection has been reported in women who have previous evidence of antibody.7

Serologic specimens should include information regarding the date of the last menstrual period and the date of presumed exposure (or date of onset of symptoms).60 If the woman has an antibody titre below the protective level, or a low level of antibodies and remains asymptomatic, a second specimen should be collected 28 days after the exposure (or onset of symptoms) and tested in parallel with the first. Alternatively, if the woman develops symptoms/signs of rubella infection, a second serum specimen should be tested as soon as possible. A third blood specimen may be required in some circumstances.8 Testing for infection can also be done, particularly early in the course of a clinical illness, using virus-detection methods, such as nucleic acid amplification testing (PCR).60

Pregnant women should be counselled to restrict contact with persons with confirmed, probable or suspected rubella for 6 weeks (2 incubation periods).60 Counselling of pregnant women with confirmed rubella regarding the risk to the fetus should be given in conjunction with the woman’s obstetric service.

Use of normal human immunoglobulin in pregnant women exposed to rubella
Post-exposure prophylaxis with normal human immunoglobulin (NHIG) does not prevent infection in non-immune contacts and is, therefore, of little value for protection of susceptible contacts exposed to rubella.7 However, it may prolong the incubation period. If given to non-immune pregnant contacts, this may marginally reduce the risk to the fetus. It may also reduce the likelihood of clinical symptoms in the mother. In such cases, IM administration of 20 mL of NHIG within 72 hours of rubella exposure might reduce, but will not eliminate, the risk for rubella.60 Serological follow-up of recipients is essential, and should continue for up to 2 months.

There is some evidence to suggest that, in outbreak situations, pre-exposure NHIG may be effective in preventing infection in women who are likely to be pregnant, and its use may be indicated for such women with low antibody titres in high-risk occupations.61

4.18.13 Variations from product information
The product information for MMR and MMRV vaccines recommends that women of child-bearing age should be advised not to become pregnant for 3 months after vaccination. The ATAGI instead recommends avoiding pregnancy for 28 days after vaccination.41

For further information on MMR and MMRV vaccines, refer to 4.9 Measles and 4.22 Varicella.

References
A full reference list is available on the electronic Handbook or website www.immunise.health.gov.au.


