

## BIOLOGICAL AGENTS

### Toxoplasma gondii

A single-celled parasite called *Toxoplasma gondii* causes a disease known as **toxoplasmosis**. A healthy person's immune system usually keeps the parasite from causing illness. However, pregnant women (and individuals who have compromised immune systems) should be cautious; for them, a *Toxoplasma* infection could cause serious health problems.

People can contract toxoplasmosis by:

- eating undercooked, contaminated meat;
- accidental ingestion of undercooked, contaminated meat;
- eating food that has been contaminated by knives, utensils, cutting boards and other foods that have had contact with raw, contaminated meat;
- drinking contaminated water; accidentally swallowing the parasite through contact with cat faeces that contain *Toxoplasma*; or
- accidentally ingesting contaminated soil and mother-to-child (congenital) transmission.

### Listeria monocytogenes

Listeria infection is caused by eating food that contains the *Listeria monocytogenes* bacteria. These bacteria are widespread in the environment and can sometimes contaminate certain high risk foods that have not been thoroughly cooked or properly prepared or stored. Listeria infection is not normally transmitted between people, although it can pass from a pregnant woman to her unborn baby. While Listeria infection is uncommon in healthy people, people at greater risk of infection include

pregnant women and their unborn or newborn babies (and people whose immune system has been weakened due to illness such as cancer, diabetes, alcoholism, or medications that impair immunity such as steroids and anti-cancer drugs).

### Cytomegalovirus (CMV)

CMV can be transmitted from a pregnant woman to her foetus during pregnancy. The virus in the mother's blood crosses over the placenta and infects the foetus' blood. The virus is generally passed on from infected people to others through direct contact with body fluids, such as urine, saliva, vaginal secretions and semen.

### Parvovirus B19

Parvovirus B19 is a virus that commonly infects humans. The most common illness caused by parvovirus B19 is 'fifth disease', a mild rash illness that occurs most often in children. (Dogs and cats may be immunised against 'parvovirus', but these are animal parvoviruses that do not infect humans.)

Infection by parvovirus B19 generally causes only a mild illness. However, if a pregnant woman is infected, the infection may be transmitted to the foetuses. In less than 5% of cases, parvovirus B19 infection may cause the unborn baby to have severe anaemia (low blood count) and the woman may have a miscarriage. This occurs more commonly if infection occurs during the first half of pregnancy. There is no evidence that parvovirus B19 infection causes birth defects or intellectual disability. Still, a pregnant woman who has been exposed to parvovirus B19 should seek the advice of the doctor managing your pregnancy.

### Rubella virus (German Measles)

Rubella infection in a woman in the first eight to 10 weeks of pregnancy results in death of or damage to the foetus in up to 90% of cases. Multiple defects are common (e.g., deafness, blindness, brain and heart damage, and mental handicap) and late complications are being increasingly recognised. The risk lowers to about 10-20% if the mother gets rubella at 16 weeks gestation and defects are rare after 20 weeks.

All pregnant women with suspected rubella or exposure to rubella should seek specialist obstetric advice, regardless of a history of rubella or rubella vaccination. Rubella re-infection, often without symptoms, can occur in individuals who have had previous infection or vaccination, although foetal damage is very rare in these cases.

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### **Human Immunodeficiency Virus (HIV)**

Without treatment, HIV infection will usually result in Acquired Immunodeficiency Syndrome (AIDS). New HIV therapies have resulted in much lower AIDS-related illness and death; however, HIV remains a life-long infection.

HIV infection occurs when particular body fluids (blood, semen, vaginal fluid and breast milk) containing the virus come into contact with another person's tissues beneath the skin (e.g., through needle puncture or broken skin), or mucous membranes (lining of eyes, nose, mouth, anus, vagina and urethra).

Infections which can be passed on by:

- coming into contact with body fluids via a needle stick injury
- mother-to-baby transmission during pregnancy, birth or breastfeeding

Administration of anti-HIV medication to HIV positive pregnant women during pregnancy and labour and after delivery, as well as to the newborn baby, reduces mother-to-baby transmission of HIV.

### **Q fever (Coxiella burnetii)**

Q fever is an infection caused by *Coxiella burnetii*, a type of bacteria that is found worldwide (except New Zealand). The infection is almost always related to direct or indirect contact with animals such as cattle, sheep or goats, although a wide range of animals including cats, dogs and kangaroos may carry the infection without symptoms.

A Q fever vaccine has been developed and is 96-100% effective in preventing the disease. However, vaccination of those already exposed to Q fever can result in severe reactions, so before being vaccinated a person must be tested to see if they have previously been exposed, either naturally or by previous vaccination. This is done by having a blood test and a skin test. If there is evidence of previous Q fever exposure, the person should not be vaccinated.

Pregnant women who are infected may be at risk for pre-term delivery or miscarriage. The three groups at highest risk for chronic Q fever are pregnant women, immunosuppressed persons and patients with a pre-existing heart valve defects.

### **Hepatitis Viruses**

During pregnancy, viral hepatitis is associated with the lowest risk of obstetric complications when compared with other potential liver complications. In most cases, no special treatment is required during the acute phase.

#### **Hepatitis B (HBV)**

- HBV infects the liver and has an incubation period of 6 weeks - 6 months.
- Many carriers of HBV are asymptomatic.
- HBV is excreted in body fluids, including blood, saliva, vaginal fluid and breast milk.

#### **Hepatitis C (HCV)**

- HCV is a blood borne viral liver infection that can result in liver disease, such as cirrhosis, liver failure and hepatocellular carcinoma.

The incubation period is 6 - 10 weeks; however, seroconversion (development of detectable specific antibodies to

- microorganisms in the blood serum as a result of infection or immunisation) may occur up to three months
- The initial acute hepatitis may not be diagnosed as symptoms are mild or absent.

Transmission of HCV is primarily through blood to blood contact, e.g.

- Needle stick injury.
- Transfusion of contaminated blood or blood products.
- There is minimal risk of transmission of Hepatitis C through medical procedures in Australia (due to the introduction of standard precautions for all procedures). There is no vaccine available against HCV.

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**Varicella-zoster virus VZV (Chickenpox)**

Varicella (chickenpox) is a highly contagious disease caused by primary infection with varicella-zoster virus (VZV). Reactivation of latent infection, usually many years after the primary infection, may result in herpes zoster (shingles), a painful vesicular eruption in the distribution of sensory nerve roots. Infection with chickenpox may occur through airborne/respiratory droplet and direct contact with vesicle fluid.

In herpes zoster (shingles), transmission of infection usually requires contact with vesicle fluid; however, there is also evidence of respiratory spread.

Seek medical advice before beginning or continuing work with human pathogens whilst considering pregnancy, pregnant or breast feeding.

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