

# You've Got What?

4th Edition – 2009

Prevention and control of notifiable and other  
infectious diseases in children and adults



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### Department of Health

#### Communicable Disease Control Branch

PO Box 6

RUNDLE MALL SA 5000

Telephone: 08 8226 7177

Facsimile: 08 8226 6648

Email: cdc@health.sa.gov.au

### References

These guidelines have been produced by members of the Communicable Disease Control Branch, Department of Health, South Australia, with references to the following texts:

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# Glossary

## **Contact**

In the transmission of infectious diseases, a contact is any person who has been close enough to an infected person to be at risk of having acquired the infection from that person.

## **Immunoglobulins**

Proteins produced by the body as part of the immune response. They help the body to fight infections by acting as antibodies.

## **Polymerase Chain Reaction (PCR)**

A technique for amplifying (increasing the amount of) genetic material in a specimen. It is often used in pathology laboratories for diagnostic tests, where a very small amount of genetic material (DNA or RNA) that might be present in bacteria or viruses can be increased enough to enable it to be detectable.

## **Serotype**

Groups of microorganisms that are extremely closely related, but can be distinguished by having slightly different antigens or causing the body to produce slightly different antibodies.

## **Post Exposure Prophylaxis (PEP)**

Antibiotics, vaccination or immunoglobulins may be offered to contacts after exposure to some infectious diseases. This may prevent the development of the infection during the incubation period, make the infection less severe if it does develop or reduce the risk of the infection being passed on to other persons.

# Introduction

Infectious diseases are illnesses caused by the spread of microorganisms (bacteria, viruses, fungi or parasites) or prions to humans from other humans, animals or the environment, including food and water.

This is the fourth edition of this book, which aims to give a basic understanding of the ways infectious diseases are spread, and simple, practical advice for preventing the spread of infectious disease in the home and community.

Specific infectious diseases are described in the section headed Specific Conditions. Diseases have been included because they occur commonly or because they cause particular concern in the community (the names used are those by which these conditions are commonly known). For infectious diseases not included here, see the *Control of Communicable Diseases Manual*, edited by David L. Heymann, 18th edition, 2004.

Some of the infectious diseases are described as notifiable. In South Australia this means that the **doctor** and **laboratory** diagnosing this disease are required by law, under Section 30 of the *Public and Environmental Health Act 1987*, to notify all cases to the Communicable Disease Control Branch of the South Australian Government Department of Health (phone (08) 8226 7177). Notification ensures that steps are taken, where necessary, to prevent the spread of an infectious disease to other people in the community.

Some disease conditions link to other parts of the book. For example, hand, foot and mouth disease links to hand hygiene and keeping areas clean. These links can be found in the attention boxes at the end of some chapters and make reference by chapter title and page to other relevant sections.

The contents of this book, by section and by individual fact sheets, are available from the Communicable Disease Control Branch website: <http://www.health.sa.gov.au/pehs/youve-got-what/youve-got-what-index.htm>.

These fact sheets will be updated whenever necessary, so for the most up-to-date information please refer to the fact sheets on this website.





You've Got What?

# General Topics

# The Ways Infectious Diseases Spread

Infectious diseases can spread in a variety of ways: through the air, from direct or indirect contact with another person, soiled objects, skin or mucous membrane, saliva, urine, blood and body secretions, through sexual contact, and through contaminated food and water.

## Airborne droplets from the nose and throat

Some infections are spread when an infected person sneezes or coughs out tiny airborne droplets. The droplets in the air may be breathed in directly by another person or indirectly enter another person through contact with surfaces and hands with the droplets on them.

*Examples of airborne diseases:*

- > Chickenpox
- > Common cold
- > Diphtheria
- > *Haemophilus influenzae* type b (Hib) infection
- > Influenza
- > Measles
- > Meningitis (bacterial)
- > Meningococcal disease
- > Mumps
- > Parvovirus infection
- > Pneumococcal pneumonia
- > Rubella
- > Streptococcal sore throat
- > Tuberculosis (TB)
- > Whooping cough (pertussis).

## Urine

Some infections are spread when urine is transferred from soiled hands or objects to the mouth.

*Example of a disease spread by urine:*

- > Cytomegalovirus infection (CMV).

## Faecal-oral

Some infections are spread when microscopic amounts of faeces from an infected person with symptoms or an infected person without symptoms (a carrier) are taken in by another person by mouth. The faeces may be passed directly from soiled hands to the mouth or indirectly by way of objects, surfaces, food or water soiled with faeces.

*Examples of diseases spread from faeces:*

- > *Campylobacter* infection
- > Cryptosporidiosis
- > Giardiasis
- > Hand, foot and mouth disease
- > Hepatitis A
- > Meningitis (viral)
- > Rotavirus infection
- > *Salmonella* infection
- > *Shigella* infection
- > Thrush
- > Viral gastroenteritis
- > Worms
- > Yersiniosis.

## Blood/body fluids

Some infections are spread when blood or other body fluids from an infected person comes into contact with the mucous membranes or bloodstream of an uninfected person, such as through a needle stick or a break in the skin.

*Examples of diseases spread through blood/body secretions:*

- > Hepatitis B
- > Hepatitis C
- > Human immunodeficiency virus (HIV/AIDS)
- > Cytomegalovirus (CMV) infection.

# The Ways Infectious Diseases Spread (cont.)

## Skin or mucous membrane (lining of nose and mouth) contact

Some infections are spread directly when skin or mucous membrane comes into contact with other skin or mucous membrane. Infections are spread indirectly when skin or mucous membrane comes in contact with contaminated objects or surfaces.

*Examples of diseases spread by skin or mucous membrane contact:*

- > Chicken pox
- > Cold sores (herpes simplex)
- > Conjunctivitis
- > Hand, foot and mouth disease
- > Head lice
- > Molluscum contagiosum
- > Ringworm
- > Scabies
- > School sores (impetigo)
- > *Staphylococcus aureus* infection
- > Warts.

## Sexually transmitted infections

These infections are most commonly transmitted by sexual contact. Sexual contact means genital to genital, oral to genital, or oral or genital to anal contact.

*Examples of sexually transmitted diseases:*

- > *Chlamydia*
- > Genital herpes
- > Genital warts
- > Gonorrhoea
- > Hepatitis B
- > HIV/AIDS
- > Non specific urethritis (NSU)
- > Pubic lice (crabs)
- > Syphilis
- > Trichomoniasis.

## Food or waterborne diseases

These diseases result from ingestion of water or a wide variety of foods contaminated with disease-causing micro-organisms or their toxins. Often these infections are also spread by the faecal-oral route.

*Examples of food or waterborne diseases:*

- > Botulism
- > *Campylobacter* infection
- > Cholera
- > *Cryptosporidium* infection
- > Haemolytic uraemic syndrome
- > *Listeria* infection
- > *Salmonella* infection
- > *Shigella* infection
- > Typhoid/Paratyphoid
- > *Yersinia* infection.

## Saliva

Some infections are spread by direct contact with saliva (such as kissing) or indirect contact with contaminated objects (such as children sucking and sharing toys).

*Examples of diseases spread by saliva:*

- > Cytomegalovirus (CMV) infection
- > Glandular fever
- > Hepatitis B.

## The Ways Infectious Diseases Spread (cont.)

### Diseases where person-to-person spread occurs rarely, if ever

Some infectious diseases are almost without exception never spread by direct contact with an infected person. These diseases are usually spread by contact with an environmental source such as animals, insects, water or soil.

*Examples of diseases spread by contact with animals:*

- > Cat-scratch disease
- > Hydatid disease
- > Psittacosis
- > Q fever
- > Rabies
- > Toxoplasmosis.

*Examples of diseases spread by insects:*

- > Barmah Forest virus infection
- > Dengue fever
- > Malaria
- > Ross River virus infection.

*Examples of diseases spread by contact with water or soil:*

- > Amoebic meningitis
- > Legionellosis
- > Tetanus.

# Hand Hygiene

Hand hygiene is the most important way to stop the spread of infection.

Hand hygiene refers to any method which effectively removes soil and any harmful germs. These include washing with soap and water or using an alcohol based hand rub.

## How to wash your hands properly

- > Use soap and running water.
- > Wet hands thoroughly and lather with soap.
- > Rub hands vigorously for at least 10 to 15 seconds as you wash them.
- > Pay attention to the backs of hands, wrists, between fingers and under fingernails.
- > Rinse hands well under running water.
- > Dry hands with a disposable paper towel or a clean towel. To minimise chapping (reddening, roughening or cracking of skin) of hands, pat dry rather than rub them. Electric hand driers may be used. If cloth towels are used, select a fresh towel each time or if a roller towel is used, select a fresh portion of towel.
- > Turn off the tap with the used towel.
- > Use skin moisturiser, if necessary, to prevent dry cracked skin.
- > If you use skin moisturiser, it should be washed off before preparing or handling food.

Hands should be washed:

- > after going to the toilet
- > before and after handling food
- > after sneezing, coughing, blowing nose
- > after caring for someone who is sick
- > after changing a nappy
- > after handling rubbish
- > after smoking.

Cuts and abrasions should be covered with a water resistant dressing which should be changed as necessary or when the dressing becomes soiled.

## Hand soap

A bar of soap or liquid soap may be used for hand washing. If bar soap is used, ensure it is kept in a container that allows drainage. If reusable containers are used for liquid soap, they must be cleaned and dried before refilling with fresh liquid soap. The type of soap does not matter provided it is well tolerated by the user.

Antibacterial hand washes are not necessary in most cases, and may encourage the development of resistant bacteria. When soap and water are not readily available, alcohol based hand rubs are acceptable but only if the hands are not visibly soiled. Similarly, baby wipes may be useful when changing babies' nappies if there are no facilities for washing with soap and water.

### Useful website

- > **Wash, Wipe, Cover**  
<http://www.health.sa.gov.au/INFECTIONCONTROL/>

# Keeping Areas Clean

Person-to-person spread, especially by soiled hands, is the major means of spread of infectious disease. In general, household surfaces play a minor role. However, regular cleaning is still important to maintain a healthy environment.

Cleaning with detergent and warm water is all that is usually necessary to maintain a clean and healthy environment. Unnecessary use of disinfectants encourages the development of bacteria that are harder to kill.

Kitchen hygiene is important to prevent food poisoning.

All surfaces in the kitchen – crockery, cutlery, bench tops, stoves and sinks, walls and the inside surfaces of cupboards – need to be kept clean. Leaving leftovers and spills to become dry will make them much harder to remove.

To effectively clean a surface in the kitchen you need to remove all visible soiling using detergent and warm water. This is usually all that is necessary. Surface disinfectants are usually not necessary and only work well on a surface that has already been cleaned.

If you do use a disinfectant, it is important to follow the manufacturer's instructions on its use. This includes how much water to add to it, what water temperature to use, and how long the object needs to be in contact with the disinfectant.

Diluted disinfectants deteriorate on standing. All diluted disinfectant should be used immediately after preparation.

Wear gloves when using chemical disinfectants as disinfectants are a common cause of dermatitis.

Empty buckets after use, wash with detergent and warm water and store dry.

Mops should be cleaned in detergent and warm water and stored dry.

Cleaning sponges should be changed frequently or disinfected regularly. Separate sponges should be used for cleaning dishes and cleaning floors. Floor spills should not be cleaned up with the dish sponge. Mop floor spills with a single-use paper towel that can be thrown away.

Dishes should be washed in warm to hot soapy water and rinsed in warm to hot water. (Always ensure water temperatures can be comfortably tolerated to avoid scalding. This is especially important for children and the elderly.) It is best to leave dishes to air dry. If you do this, don't place a tea towel over them as this will only spread bacteria from the tea towel onto the clean dishes. Change your tea towel when it becomes dirty or wet.

Separate chopping boards should be used for raw meats and ready-to-eat foods. If this cannot be done, the chopping board used for meat should be washed in hot soapy water and rinsed before being re-used. The same applies to utensils, knives, benches and plates. Chopping boards can be disinfected by washing in hot soapy water and then rinsing with diluted bleach, or washed in a dishwasher using the highest heat setting.

Clean inside your fridge and cupboards regularly. Crumbs in cupboards can attract pests and dirty fridges can carry bacteria and moulds.

## Hygiene in the garden

Sandpits can become contaminated with animal faeces and urine. Sandpits need to be properly constructed with adequate drainage. The sand should be raked often, and when not in use the area should be covered (for example, with a tarpaulin or shade cloth).

Many gardening activities bring the gardener into contact with organisms that can cause illness. Gardeners should wear gloves during gardening and always wash their hands before eating, drinking or smoking. If vegetables are brought into the kitchen from the home garden they should first be thoroughly washed outside of the house. Wash hands after using potting mix, and avoid inhaling the dust from it.

### Useful website

> **Enjoying Gardening Without the Risk of *Legionella***

<http://www.health.sa.gov.au/pehs/PDF-files/enjoy-gardening07.pdf>

# Preventing Food Poisoning at Home

## What is food poisoning?

Food poisoning is illness resulting from consumption of contaminated food or water. Food can be contaminated by bacteria, viruses, parasites or fungi, or by toxins produced by them. Food poisoning is one of the most common illnesses in Australia, with an estimated 4-7 million cases of foodborne illness each year.

## General principles

Many different organisms can cause food poisoning. Most are particular types of bacteria and more than 95% of reported cases of bacterial food poisoning are caused by just two species, *Campylobacter* and *Salmonella* (see links to separate fact sheets below). Dangerous bacteria can survive on many foods.

Sources of food poisoning include:

- > unpasteurised milk
- > improperly handled eggs, especially cracked or soiled eggs
- > undercooked meats, including beef, pork and especially chicken
- > stored cooked rice, gravies and sauces (including home made mayonnaise)
- > fresh fruit and vegetables.

Contaminated food may not look, smell or taste any different from food that is safe.

The risk of food poisoning is significantly reduced if food is correctly handled and cooked, and eaten immediately or stored properly.

Food poisoning can be caused by:

- > preparing food without washing hands properly beforehand
- > someone who is sick preparing food for others to eat
- > eating food that is not cooked thoroughly

- > allowing food to be at a temperature for more than four hours that allows bacteria to grow well. Keep food cold enough (fridge or freezer) or hot enough (steaming hot) to guard against bacterial growth. However, the bacteria *Listeria* will grow in refrigerators. *Listeria* is an important cause of illness in the elderly, immunocompromised persons and pregnant women and can cause death and miscarriages (see link to separate fact sheets below)
- > cross contamination from raw meat in the kitchen. Raw meat is the most important source of dangerous bacteria. This is especially so with raw poultry which is nearly always contaminated with *Campylobacter* and *Salmonella*. Proper cooking kills these bacteria but they can be easily transferred to foods that won't be further cooked (e.g. salads) by hands or utensils such as chopping boards or knives. Avoid hand contact with raw meat but if this isn't practical, wash hands thoroughly afterwards. Thorough cleaning of chopping boards and knives with detergent and warm water is required after each use. Best practice is to have a separate chopping board for raw meat and to clean the board and utensils in a dishwasher
- > drinking contaminated water.

## Personal hygiene practices

Always wash your hands before preparing or eating food. Remember also to wash your hands after:

- > using the toilet for any reason. A variety of surfaces in the toilet may have traces of faeces on them
- > changing nappies
- > handling raw meat
- > using a handkerchief or tissue, coughing or sneezing
- > smoking
- > touching animals
- > handling garbage
- > gardening.

# Preventing Food Poisoning at Home (cont.)

## Do not:

- > sneeze or cough over food
- > prepare food for others if suffering from throat, skin or bowel infections
- > smoke in areas where food is prepared
- > use a dirty tea towel for drying dishes – it is better to let them air dry on a draining board.

## Do:

- > protect cuts and sores with a clean dressing and waterproof cover or disposable gloves
- > prevent hair from falling into food – tie it away from the face
- > ensure that children wash their hands before eating or assisting with food preparation
- > clean inside your cupboards and fridge regularly – crumbs in cupboards can attract pests and dirty fridges can harbour bacteria.

## Pests

Pests such as flies, cockroaches and mice carry disease. Keep food safe by:

- > keeping flies out of the kitchen, storage and dining areas
- > using fly spray thoughtfully – cover all food before you spray and until you can no longer smell the spray
- > keeping food scraps stored in garbage bins with close fitting lids – this prevents pests eating the scraps and breeding
- > storing chemicals used to control pests in areas away from those used to store, prepare or eat food.

## Pets

Do not allow animals into kitchens – in particular, do not feed them in the kitchen. Do not wash pet food bowls in the kitchen sink.

## Shopping

The inside of a car provides the ideal environment and temperature for bacteria to multiply, so food should be in the car for as short a time as possible.

Get refrigerated and frozen foods at the end of the shopping trip and keep them cold.

Keep hot foods separate from cold foods.

Check date markings on food packages, for example, use by or best before dates.

Never buy or use:

- > badly dented cans
- > leaking cartons, cans, bottles or containers
- > food packaged in torn or ripped packaging or packaging that has been tampered with
- > food packages or cans that are swollen
- > cracked or soiled eggs
- > ready-to-eat food that has been in contact with raw meat, chicken or their juices. Take note of how ready-to-eat foods are presented as you shop
- > products in vacuum packs if the packaging has become loose.

## Storing food

Remember to:

- > store eggs in the fridge. This improves quality and minimises any safety risk
- > immediately freeze products that you do not intend to use before the use by date. Freezing greatly extends the use by date.
- > check the temperature of your refrigerator using a fridge thermometer. It should be 5°C or less.

Cooked food can be allowed to cool to reasonably warm (about 45°C) before it is put into the fridge; it is not essential to let it completely cool. Food will cool faster in smaller containers, and metal containers lose heat faster than plastic ones.

Store raw meats near the bottom of the fridge to ensure that juices do not drip onto other foods. Alternatively, put meat onto a covered tray or container within the fridge.

# Preventing Food Poisoning at Home (cont.)

Keep raw foods on separate plates from ready-to-eat foods such as cooked foods and salads. Bacteria still grow in foods that have been kept refrigerated – they just take longer to grow.

## Handling and preparing food

Safe food handling and preparation practices include:

- > washing hands well in soapy water for at least 10 to 15 seconds before preparing food, before eating and after touching raw meats
- > asking other people to prepare food if you are not feeling well
- > never placing cooked foods on dishes that have contained raw products such as meat, poultry and fish, unless the plates have been thoroughly washed first
- > never using a sauce on cooked food if it has been previously used to marinate raw meat or seafood, unless the marinade has been cooked first or will be cooked. For example, do not spoon the uncooked juices or marinade over the cooked food and serve. The uncooked marinade will probably contain harmful bacteria.

All fruit and vegetables should be thoroughly washed if they are to be eaten raw.

Sprouts and herbs should be rinsed before serving.

Never keep perishable food outside of a fridge for longer than four hours.

Never refrigerate perishable foods that have been at room temperature for more than two hours. This includes preparation and serving time. For more information visit: <http://www.dh.sa.gov.au/pehs/Food/2hour-4hour-rule.pdf>.

## Thawing frozen foods

Thaw meat and other foods in the bottom of the fridge whenever possible. Food can be thawed in a microwave oven, at room temperature (for example, on a bench) or in water, provided the food is cooked immediately after it has thawed.

Take great care if you cook meat when it is only partially thawed. Make sure that it is cooked right through.

## Cooking and reheating

The surface of meat is usually the part that is contaminated with bacteria. Problems arise especially when contamination from the outside is moved to the inside, such as when meat is minced or sliced or a skewer is pushed through the meat. Then the meat must be thoroughly cooked right through. Therefore mince, sausages, hamburger patties, rolled roasts, kebabs, yiros, shashliks and other such foods should be cooked right through. Thorough cooking means that there is no pink meat and the juices run clear when the meat is skewered, cut or pressed.

If you have access to a meat thermometer, you can use it to check the internal temperatures. In the case of hamburgers and poultry, make sure they are cooked throughout. Aim for around 75°C in the centre of the meat item.

Microwaves are a quick and convenient way to cook foods, but they tend to heat foods rather unevenly, leaving cold spots. So, when microwaving foods, always rotate and stir the food during cooking for more even cooking. Also, wait until the required standing time is over before you check that cooking is complete, because foods continue to cook even when the microwave is turned off.

When reheating foods, heat to steaming hot. This will kill any bacteria which may have grown on the food in the fridge.

# Preventing Food Poisoning at Home (cont.)

## Eating outdoors

(picnics, barbecues, camping, school lunches)

Warm summer weather is perfect for bacteria to grow.

Keep all food cold, unless it has just been cooked and will be eaten hot straight away. Don't pack food if it has just been cooked and will be eaten cool. Let it get cold in the fridge first.

Do the maximum amount of food preparation at home, particularly if hand washing facilities are inadequate at the place where the food will be eaten.

When camping, it is best to pack dried, canned and UHT foods rather than fresh foods.

When packing children's lunches, either pack a frozen ice block drink in the lunch box to keep food cold (summer and winter) or choose foods that will not 'go off'. That is, do not pack foods that would normally be kept in the fridge, such as milk, soft cheese, meats or eggs, even in sandwiches. Fillings for sandwiches that are fairly safe under warmer conditions are often those fillings that can sit on a shelf without needing refrigeration, such as honey, yeast extracts and peanut butter products. In some schools where there are children with severe allergies to nuts and nut products, parents may be asked not to include these products in their children's school lunches.

## Eating out

(restaurants and take-aways)

Cold foods should be cold to the touch and should be displayed on ice or in a fridge.

Poultry, mince, sausages, hamburger patties, rolled roasts, kebabs, yiros, shasliks and other such foods should be cooked right through. If they are not, send them back.

Eat hot foods while they are still hot. Be careful about handling leftovers, including foods taken home in a 'doggy bag'. They should be put in the refrigerator as soon as possible.

If you are not happy with the safe handling of the food at a restaurant or take-away, contact your Environmental Health Officer at your local council and discuss your concerns.

- > *Campylobacter* Infection page 38
- > *Salmonella* Gastroenteritis page 124
- > Listeriosis page 90

### Useful websites

- > **Food Safety**  
<http://www.health.sa.gov.au/pehs/food-index.htm>
- > **Wash, Wipe, Cover**  
<http://www.health.sa.gov.au/INFECTIONCONTROL/>

# Handling Blood and Other Body Substances

## Handling blood and other body substances (standard precautions)

To minimise the risk of spread of infection, all blood and body substances should be treated as potentially infectious. The techniques used in handling these substances are known as standard precautions.

Standard precautions are recommended in the handling of:

- > blood, including dried blood
- > all other body substances including saliva, urine and faeces (but excluding sweat), regardless of whether they contain visible blood
- > broken skin
- > mucous membranes (lining of nose, mouth and genitals).

Standard precautions are good hygiene practices relating to hand hygiene, the use of gloves and other protective clothing (as appropriate), and the safe disposal of waste.

## Managing exposure to blood or other body substances

If any person has contact with blood or body fluids, the following procedures should be observed:

- > Remove contaminated clothing.
- > If blood or body fluids get on the skin, irrespective of whether there are cuts or abrasions, wash well with soap and water.
- > If the eyes are splashed, rinse the area gently but thoroughly with water while the eyes are open.
- > If blood or body fluid gets in the mouth, spit it out and rinse the mouth with water several times, spitting the water out each time.
- > Incidents occurring at work should be reported immediately to the supervisor or occupational health, safety and welfare officer.
- > Incidents occurring outside of work should be reported immediately to a doctor or the Emergency Department at the nearest hospital. If a person thinks they have been exposed to HIV, there is a four-week treatment that may prevent them becoming infected. They can call the South Australian 24 hour Post Exposure Prophylaxis (PEP) triage hotline on 1800 022 226, or ask their local doctor, sexual health clinic or emergency department for more information.

## Surface cleaning of blood and body substances

If blood or body fluids are spilled on surfaces, the following cleaning procedures should be used:

- > Deal with the spill as soon as possible.
- > Protect yourself by wearing disposable rubber gloves. Eye protection and a plastic apron should be worn where there is a risk of splashing.
- > Remove as much of the spill as possible with a paper towel.
- > Clean area with warm water and detergent, using a disposable cleaning cloth or sponge. The area should be left clean and dry.
- > Disinfect the area with a solution of household bleach, diluted according to the manufacturer's instructions.
- > Remove and dispose of gloves, paper towel and cleaning cloth in a sealed plastic bag after use. The plastic bag may then be thrown away with household waste.
- > Wash hands thoroughly with soap and warm water.

- > **Post Exposure Prophylaxis (PEP) page 6**
- > **Hepatitis B page 72**
- > **Hepatitis C page 75**
- > **HIV page 81**

# Avoiding Sexually Transmitted Infections (STI)

Abstinence is one way of avoiding a sexually transmitted infection. The majority of Australian adults however choose to be sexually active.

If you are sexually active there are ways of reducing your risk of acquiring a sexually transmitted infection or STI.

When used correctly, condoms in combination with a water based lubricant will reduce the risk of many STIs during vaginal, anal or oral sex. Latex gloves also provide barrier protection for sexual activity involving fingers and dams can be used to protect against STIs during oral sex.

Not all STIs have obvious symptoms (e.g. herpes, genital warts and *Chlamydia*) and therefore it can be difficult to know whether you or your partner has an infection.

Practising safe sex by using condoms and dams can be an effective way of reducing the risk of STIs that have no immediate or obvious symptoms.

If you're not sure whether you or your sexual partner has an STI or if you are in a sexual relationship of three months or less you can guard your health and the health of others by always using protective measures such as condoms and dams.

## Unsafe or unprotected sex in a relationship

Negotiated safety is where both partners test negative for STIs and mutually agree not to use condoms and dams as part of their sexual relationship.

Negotiated safety provides a safe context for unprotected vaginal, anal or oral sex, but for it to work as an agreement three things are essential:

**1. Talking.** Talk openly with your sexual partner and arrive at a mutual agreement about not using condoms and dams, and about the need to be safe from STIs.

**2. Testing.** Test for STIs at least three months after the last time you had unprotected sex with anyone, including your current sexual partner. Three months is usually enough time for most STIs, but not all, to show up on a test. Talk to your doctor about the different incubation periods for other STIs.

If you and your sexual partner both have negative tests for STIs, you can then consider having unprotected sex.

**3. Trusting.** Once you and your sexual partner have made an agreement to have unprotected sex you both have to be willing to stick to it. This will mean having unprotected sex only with the sexual partner who has been tested and cleared of STIs and with whom you have negotiated to have unprotected sex.

You and your sexual partner may also need to talk about reintroducing safe sex practices if either of you engage in unsafe sex outside of the relationship.

If you or your partner has unprotected sex outside of your sexual relationship you will need to return to protective or barrier methods for at least three months and then get tested again.

*The contraceptive pill does not provide protection against any STI.*

### Useful websites

- > **Clinic 275**  
<http://www.stdservices.on.net/std>
- > **SHine SA**  
<http://www.shinesa.org.au/>

# Immunisation

Immunisation has proven to be one of the most effective medical treatments we have to prevent disease.

Modern vaccines provide good levels of protection against many diseases and against the disability and death they can cause. Immunising a person not only protects that person, but other people as well by increasing the community level of immunity and minimising the spread of infection.

As with most medical treatments, immunisation is not entirely risk-free, yet the currently available vaccines are many thousands of times safer than the risks of the diseases they prevent.

Contraindications to a vaccine and the risk of side effects need to be discussed before being immunised.

A large number of vaccines are available. Some are recommended for use by all children or adults and are on the NHMRC (National Health and Medical Research Council) National Immunisation Program Schedule, Australia. Because this schedule changes quite frequently, the most up-to-date version is found online at <http://www.immunise.health.gov.au/> or by referring to the latest edition of the *Australian Immunisation Handbook*.

There are also many additional vaccines for use in certain circumstances, and the use of these is described under specific conditions in this handbook or website.

Further information on vaccination can be obtained from your doctor or by phoning the Immunisation Section, SA Health on (08) 8226 7177. For further information for other Australian states, contact the health department in that state or territory or the National Immunisation Program.

## Useful website

> **Australian Immunisation Handbook**  
<http://www.immunise.health.gov.au/>

# Exclusion from Child Care, Preschool and School

The spread of certain infectious diseases can be reduced by excluding a person, known to be infectious, from contact with others who are at risk of catching the infection.

The need for exclusion depends on:

- > the ease with which the infection can be spread
- > the ability of the infected person to follow hygiene precautions
- > whether or not the person has some immunity to the infection (either from vaccination or past infection)
- > to a lesser extent, the severity of the disease.

A person who is not excluded may still need to remain at home because they do not feel well.

Recommended exclusion periods are based on the time that a person with a specific disease or condition might be infectious to others.

Recommended non-exclusion means that there is not a significant risk of transmitting infection to others.

For further information about diseases, please refer to the specific conditions either in this publication or at <http://www.dh.sa.gov.au/pehs/youve-got-what.htm>

The following are recommended minimum periods of exclusion from school, preschool and child care centres for cases of, and contact with, infectious diseases based on guidelines issued by the National Health and Medical Research Council in December 2005 and the ninth edition of the *Australian Immunisation Handbook*. These guidelines can also be applied to the general community and most workplaces.

However, if a child care worker has gastroenteritis, the exclusion period is for at least 48 hours after the vomiting and/or diarrhoea have ceased.

## Recommended exclusion periods from child care, preschool and school

| Disease or condition                                  | Exclusion of case  | Exclusion of contacts   |
|---|--|---|
| <b>Amoebiasis</b><br>( <i>Entamoeba histolytica</i> ) | Exclude until no diarrhoea for 24 hours  | Not excluded  |
| <b>Campylobacter infection</b>                        | Exclude until no diarrhoea for 24 hours  | Not excluded  |
| <b>Candidiasis</b>                                    | See Thrush   |   |
| <b>Chickenpox</b>                                     | See Varicella-Zoster   |   |
| <b>Cytomegalovirus infection (CMV)</b>                | Exclusion is NOT necessary   | Not excluded  |
| <b>Conjunctivitis</b>                                 | Exclude until discharge from eyes has stopped (unless doctor has diagnosed non-infectious conjunctivitis)  | Not excluded  |
| <b>Cryptosporidium infection</b>                      | Exclude until no diarrhoea for 24 hours  | Not excluded  |
| <b>Diarrhoea (no organism identified)</b>             | Exclude until no diarrhoea for 24 hours  | Not excluded  |
| <b>Diphtheria</b>                                     | Exclude until medical certificate of recovery is received following at least two negative throat swabs, the first not less than 24 hours after finishing a course of antibiotics and the next 48 hours later | Exclude contacts living in same house until cleared to return by appropriate health authority |

## Exclusion from Child Care, Preschool and School (cont.)

| Disease or condition   | Exclusion of case   | Exclusion of contacts |
|--|---|-----------------------|
| <b>Food poisoning</b>  | Exclude until well – no vomiting or diarrhoea for 24 hours  | Not excluded          |
| <b>Giardiasis</b>  | Exclude until no diarrhoea for 24 hours   | Not excluded          |
| <b>Glandular fever (infectious mononucleosis, EBV infection)</b> | Exclusion is NOT necessary  | Not excluded          |
| <b>Hand, foot and mouth disease</b>                              | Exclude until all blisters are dry  | Not excluded          |
| <b><i>Haemophilus influenzae</i> type b (Hib)</b>                | Exclude until person has received appropriate antibiotic treatment for at least 4 days  | Not excluded          |
| <b>Head lice (pediculosis)</b>                                   | Exclude until appropriate treatment has commenced   | Not excluded          |
| <b>Hepatitis A</b>   | Exclude until medical certificate of recovery is received, and until at least 7 days after onset of jaundice or illness   | Not excluded          |
| <b>Hepatitis B</b>   | Exclusion is NOT necessary  | Not excluded          |
| <b>Hepatitis C</b>   | Exclusion is NOT necessary  | Not excluded          |
| <b>Herpes simplex (cold sores, fever blisters)</b>               | Young children and others unable to comply with good hygiene practices should be excluded while lesion is weeping. Lesions should be covered by a dressing where possible | Not excluded          |
| <b>Human immunodeficiency virus (HIV/AIDS)</b>                   | Exclusion is NOT necessary. If the person is severely immunocompromised they will be vulnerable to other people's infections  | Not excluded          |
| <b>Hydatid disease</b>   | Exclusion is NOT necessary  | Not excluded          |
| <b>Impetigo</b>  | See School sores  |                       |
| <b>Influenza and influenza-like illnesses</b>                    | Exclude until well  | Not excluded          |
| <b>Legionnaires' disease</b>                                     | Exclusion is NOT necessary  | Not excluded          |
| <b>Leprosy</b>   | Exclude until approval to return has been given by an appropriate health authority  | Not excluded          |

## Exclusion from Child Care, Preschool and School (cont.)

| Disease or condition  | Exclusion of case   | Exclusion of contacts  |
|---|---|--|
| <b>Measles</b>  | Exclude for at least 4 days after the onset of the rash   | Immunised and immune contacts are not excluded. Non-immunised contacts of a case to be excluded from child care until 14 days after first appearance of rash in last case, unless immunised within 72 hours of first exposure during infectious period with first case. All immunocompromised children should be excluded until 14 days after first day of appearance of rash in last case |
| <b>Meningitis (bacterial)</b>   | Exclude until well and has received appropriate antibiotics   | Not excluded   |
| <b>Meningitis (viral)</b>   | Exclude until well  | Not excluded   |
| <b>Meningococcal infection</b>  | Exclude until appropriate antibiotic treatment completed and until well   | Not excluded   |
| <b>Molluscum contagiosum</b>  | Exclusion is NOT necessary  | Not excluded   |
| <b>Methicillin resistant <i>Staphylococcus aureus</i> (MRSA) skin infection</b>           | Exclusion is NOT necessary unless infected skin lesions on exposed surfaces cannot be completely covered with a dressing. | Not excluded   |
| <b>Mumps</b>  | Exclude for 9 days after onset of swelling  | Not excluded   |
| <b>Norovirus</b>  | See Viral gastroenteritis   |  |
| <b>Parvovirus infection (Fifth disease, erythema infectiosum, slapped cheek syndrome)</b> | Exclusion is NOT necessary  | Not excluded, but people who are anaemic, immunocompromised, or pregnant should be informed of possible risk of getting infection  |
| <b>Pertussis</b>  | See Whooping cough  |  |
| <b>Respiratory Syncytial Virus</b>  | Exclusion is NOT necessary  | Not excluded   |
| <b>Ringworm/tinea</b>   | Exclude until the day after appropriate treatment has commenced   | Not excluded   |
| <b>Ross River virus</b>   | Exclusion is NOT necessary  | Not excluded   |
| <b>Rotavirus infection</b>  | Exclude until no diarrhoea for 24 hours   | Not excluded   |
| <b>Rubella (German measles)</b>   | Exclude until fully recovered or for at least 4 days after the onset of the rash  | Not excluded   |
| <b><i>Salmonella</i> infection</b>  | Exclude until no diarrhoea for 24 hours   | Not excluded   |

## Exclusion from Child Care, Preschool and School (cont.)

| Disease or condition                                       | Exclusion of case   | Exclusion of contacts  |
|--|---|--|
| <b>Scabies</b>   | Exclude until the day after appropriate treatment has commenced   | Not excluded   |
| <b>Scarlet fever</b>                                       | See Streptococcal sore throat   |  |
| <b>School sores (impetigo)</b>                             | Exclude until appropriate treatment has commenced. Any sores on exposed surfaces should be completely covered with a dressing                                 | Not excluded   |
| <b>Shigella infection</b>                                  | Exclude until no diarrhoea for 24 hours   | Not excluded   |
| <b>Shingles</b>  | See Varicella-Zoster  |  |
| <b>Streptococcal sore throat (including scarlet fever)</b> | Exclude until the person has received appropriate antibiotic treatment for at least 24 hours and feels well   | Not excluded   |
| <b>Thrush (candidiasis)</b>                                | Exclusion is NOT necessary  | Not excluded   |
| <b>Toxoplasmosis</b>                                       | Exclusion is NOT necessary  | Not excluded   |
| <b>Tuberculosis (TB)</b>                                   | Exclude until medical certificate is produced from appropriate health authority   | Not excluded   |
| <b>Typhoid, Paratyphoid</b>                                | Exclude until approval to return has been given by an appropriate health authority  | Not excluded unless considered necessary by public health authorities  |
| <b>Varicella-Zoster (chickenpox and shingles)</b>          | Exclude until all blisters have dried (usually 5 days)  | Any child with an immune deficiency (for example, leukaemia) or receiving chemotherapy should be excluded for their own protection. Otherwise, not excluded  |
| <b>Viral gastroenteritis (viral diarrhoea)</b>             | Exclude until no diarrhoea for 24 hours   | Not excluded   |
| <b>Warts (common, flat and plantar)</b>                    | Exclusion is NOT necessary  | Not excluded   |
| <b>Whooping cough (pertussis)</b>                          | Exclude from child care, school or workplace and similar settings until 5 days after starting antibiotic treatment, or for 21 days from the onset of coughing | Household and child care contacts (in the same child care group) of the case who have received < 3 doses of a pertussis containing vaccine should be excluded from child care for 14 days from the last exposure to the infectious cases, unless they have already completed 5 days of recommended antibiotic treatment, in which case they may return |
| <b>Worms</b>   | Exclude if diarrhoea present  | Not excluded   |
| <b>Yersinia infection</b>                                  | Exclude until no diarrhoea for 24 hours   | Not excluded   |

# Overseas Travel

Before travelling overseas, particularly for the first time, it is important to be aware of risks of diseases which may be encountered, and to take precautions in order to protect yourself.

In many areas of the world, food and water are less safe than in Australia, and foodborne illness is a common problem. In some countries there is significant risk of contracting diseases such as malaria or HIV, so it is important to know how to protect against these. Travellers who are contemplating tattoos, body piercing or cosmetic surgery overseas need to know that this may put them at increased risk of infection with bloodborne viruses such as hepatitis B and C.

When planning your trip, a visit to your doctor or to a travellers' health centre well in advance of departure (at least one month) will be time well spent. Check that all your routine vaccinations – including measles – are up-to-date, and get special advice for the areas to which you are travelling. Travel health centres can advise on avoiding common travel health problems such as travellers' diarrhoea, and also provide recommended or required vaccinations and medication.

For details of recommended and required vaccinations and medications contact your doctor or:

## **Globe Medical**

21 Hindmarsh Square  
Adelaide SA 5000  
Phone: (08) 8232 7372

## **The Travel Doctor**

7-29 Gilbert Place  
Adelaide SA 5000  
Phone: (08) 8212 7522

## **Travel-Bug Medical and Vaccination Clinic**

182 Ward Street  
North Adelaide SA 5006  
Phone (08) 8267 3544

## **Useful websites**

- > **World Health Organization**  
<http://www.who.int/ith/index.html>
- > **Travel Clinics Australia**  
<http://www.travelclinic.com.au/travel-health.asp>
- > **Centers for Disease Control and Prevention (CDC)**  
<http://www.cdc.gov/travel/default.aspx>
- > **The Travel Doctor**  
<http://www.traveldoctor.com.au>
- > **Smartraveller.gov.au**  
<http://www.smartraveller.gov.au/tips/travelwell.html>
- > **Globe Medical**  
<http://www.globemedical.com.au>

# Avoiding Mosquito Bites

Mosquito bites can be more than just a nuisance as some can also transmit diseases. The most common disease passed on by mosquitoes in South Australia is Ross River virus. Other serious infections transmitted by mosquitoes include viral encephalitis, Barmah Forest virus infection, dengue fever (in Northern Queensland and in tropical countries around the world) and malaria (in tropical countries around the world).

People can contract Ross River virus or Barmah Forest virus from certain species of infected mosquitoes in South Australia throughout the year, although most infections occur in the warmer months. The most common areas are along the River Murray, Murray Lakes, Coorong and parts of the upper Spencer Gulf. However, this should not stop people visiting these areas as simple protection measures are very effective at preventing mosquito bites.

Following this simple advice will reduce the chance of mosquito bites and reduce the number of mosquitoes in the immediate environment.

Self protection from mosquito bites is the key to prevention.

## Personal protection

- > Cover up with long, loose fitting clothing of sufficient thickness to prevent mosquitoes biting through the fabric.
- > Avoid exposure outdoors when mosquitoes are most active.
- > Use an insect repellent containing DEET or Picaridin (the most effective repellents contain 5-20% di-ethyl-N-toluamide or DEET) on exposed skin. Apply in accordance with the manufacturer's instructions. Avoid using on babies and toddlers.
- > Use flyscreens and mosquito nets in accommodation where there are no flyscreens, especially for babies. (This is particularly important when camping out, as repellents are only effective for around four hours.)
- > Avoid mosquito-prone areas.

## General mosquito control measures – eliminating mosquito breeding sites

Mosquitoes breed in still water (fresh, salty or stagnant). Stop mosquitoes breeding by cleaning up mosquito breeding sites around the home:

- > Dispose of all containers which hold water, or cover or put holes in them.
- > Empty pot plant drip trays once a week or put sand around pot bases to absorb water.
- > Empty bird baths and pet drinking water at least every three days.
- > Boats, canoes and dinghies should be overturned or have the drain plug removed so that they do not hold water after rain.
- > Screen all openings to tanks, wells or other large water containers with wire gauze no coarser than 1mm mesh.
- > Keep roof gutters in good repair and regularly remove leaves and debris so that pools of water do not form.
- > Dispose of all waste water in such a way that no ponding occurs. Keep all open drains and channels free from obstruction, especially weeds, grass and other debris.
- > Keep fish ponds, ornamental ponds, dams and unused swimming pools stocked with fish which will eat mosquito larvae. Goldfish or Australian native fish are recommended.
- > Keep swimming pools disinfected or salted.

- > **Ross River Virus page 118**
- > **Barmah Forest Virus page 35**
- > **Dengue Fever page 52**
- > **Malaria page 92**
- > **Murray Valley Encephalitis Virus page 100**

### Useful website

- > **Fight the Bite**  
<http://www.health.sa.gov.au/PEHS/publications/mozzies-fight-bite.htm>





You've Got What?

# Specific Conditions

# Amoebic Meningoencephalitis

Amoebic meningoencephalitis is an infection of the brain and the membranes covering the brain, which are called the meninges, caused by an amoeba (a microscopic single-celled organism).

Symptoms may include:

- > sore throat
- > headache and pain in the forehead
- > hallucinations
- > confusion
- > nausea and vomiting
- > high fever
- > neck stiffness and pain
- > disturbances of taste and smell
- > seizures.

The infection is diagnosed by examining fluid from around the spinal cord, as the amoeba causing the infection is visible under a microscope.

The amoeba that causes the infection occurs in shallow surface waters and incorrectly maintained swimming pools, hot tubs and spas, particularly in warm climates. Swimming in salt water has not been associated with this disease.

Infection occurs when infected water enters the nose. This can happen when diving, jumping or swimming in fresh water. The amoeba then invades the brain and meninges through the nose. This is a rare disease affecting mainly young, active people. It is almost always fatal.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 3 – 7 days.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread does not occur.

## Treatment

Swift diagnosis and treatment with specific antibiotics may be useful, but recoveries have been rare.

## Control of spread

- > Do not dive, jump or swim in warm surface waters.
- > Hold your nose if you need to jump into water.
- > Wading pools should be emptied each day.
- > Swimming pools and spas should be kept clean and maintained correctly.
- > Keep sprinklers and hoses away from noses.

If you want more information about maintenance of private swimming pools and spas, contact your local Environmental Health Officer through your local council.

# Animal Bites and Scratches

The mouths and claws of all animals carry bacteria which can cause an infection in the flesh around the bite and eventually, if untreated, may spread into the bloodstream.

If bites or scratches penetrate deeply, tetanus may develop.

- > Rabies and Australian Bat Lyssavirus page 114
- > Tetanus page 136

## Bat bites

Australian bats harbour a lyssavirus which is very similar to the fatal rabies virus. Only people who are immunised with rabies vaccine should approach or handle bats. If you are scratched or bitten by a bat, you should clean the wound immediately with soap and water and contact a doctor immediately for further assessment.

## Fish and other marine organisms

Scratches from fish and other marine organisms such as coral can cause unusual infections. If an injury caused by fish or a wound contaminated by sea, pond or aquarium water becomes infected, it is important to see your doctor and explain how the injury occurred

## Treatment

All animal scratches and bites should be washed quickly and thoroughly with soap and water. Deep puncture wounds, extensive superficial injuries and all injuries caused by bats should be assessed by a doctor as soon as possible.

## Prevention

To reduce the chances of illness from animal bites or scratches:

- > Pets should always be adequately restrained.
- > Sick or injured animals should be treated promptly.
- > Children approaching domestic and wild animals should be supervised.
- > Animals should not be disturbed while they are eating.
- > People who have professional contact with bats should have a current immunisation against rabies. Other people should avoid close contact.

# Anthrax

Anthrax is an acute infectious disease caused by bacteria called *Bacillus anthracis*. The anthrax bacterium produces spores (small resistant cells) which are capable of surviving for many years in the environment. Anthrax most commonly occurs in wild or domesticated warm-blooded grazing animals such as sheep and cattle, but can infect humans.

Anthrax is a very rare disease in Australia, and usually occurs in farmers or other people who have close contact with animals or their products, especially wool, hair or skins. Infection can involve the skin, if the bacteria enter a cut or abrasion on the skin. It can also occur if spores are inhaled or if meat from an infected animal is eaten. Symptoms vary depending on how the disease was contracted.

Cutaneous anthrax (involving the skin) begins as a raised itchy bump resembling an insect bite, which then develops into a vesicle (blister), then into a painless ulcer with a characteristic black area in the centre. There is usually marked swelling around the area and lymph glands in the adjacent area may swell. Up to 20% of untreated cases may result in death, but deaths are rare with appropriate antibiotic treatment.

Inhalational anthrax, where infection occurs due to spores being breathed in, may initially resemble flu-like illness, but after several days severe breathing problems and shock may develop. Without treatment, death occurs one to two days after the onset of severe symptoms.

Intestinal anthrax following consumption of contaminated meat results in nausea, loss of appetite, vomiting, fever, abdominal pain, vomiting of blood and severe diarrhoea. Up to 60% of cases will die without treatment.

Anthrax is usually diagnosed by isolating *Bacillus anthracis* from the blood, skin lesions or respiratory secretions. Anthrax is a potential agent for use in biological warfare.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 1 – 7 days, but can be up to 2 months.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person transmission of anthrax is very rare and has been reported only with cutaneous anthrax.

Articles and soil contaminated with anthrax spores may remain infective for decades.

## Treatment

Treatment with antibiotics is essential, particularly for inhalational anthrax. In some situations preventative antibiotics may also be given to people who are suspected to have been exposed to anthrax spores.

## Control of spread

- > Control of anthrax in livestock herds is essential for prevention of its spread to humans. Animals dying from anthrax usually die suddenly, with only a brief illness preceding death. By law, a farmer who suspects anthrax in an animal must notify a government veterinary officer immediately. If anthrax is suspected the farm will be isolated and herds vaccinated, and the dead animal disposed of appropriately so that contamination of the soil is minimised.
- > Anthrax vaccines exist for use in livestock in Australia, but are not currently registered for use in humans. They have been used for protection of military personnel who are considered to be at risk of exposure to biological weapons.

### Control of spread cont.

- > Safety regulations covering rendering plants and factories processing wool and hides must be adhered to. Workers should also wear protective clothing.
- > Even a single case of human anthrax is so unusual in Australia that it should be reported urgently to public health authorities. Anthrax spores have been used in bioterrorist attacks in the United States during the past few years, and it is important that sources of any infections are identified quickly so that control measures may be put into place.



**Anthrax is a notifiable disease**

### Useful website

- > **Animal Health Australia**  
<http://www.animalhealthaustralia.com.au>

# Bacterial Vaginosis

Bacterial vaginosis is the result of a major change in the types and numbers of bacteria usually found in the vagina. Changes in the normal acidity of the vagina are accompanied by an overgrowth of several different kinds of bacteria which are normally present in only very small numbers. These bacteria replace the normal protective vaginal bacteria (lactobacilli).

It used to be thought that bacterial vaginosis was caused by overgrowth of bacteria called *Gardnerella vaginalis*, but it is now recognised that these bacteria occur in many women who have no symptoms, and attempting to grow them from vaginal secretions is no longer recommended.

Symptoms include:

- > a greyish vaginal discharge
- > an unpleasant 'fishy' odour. The odour is often more noticeable after sex or during menstruation, when the acidity of the vagina changes.

Painful intercourse and genital itch do not commonly occur with this condition.

Diagnosis is made by a vaginal examination and a microscopic examination of a sample of the vaginal discharge.

Bacterial vaginosis is not considered to be a sexually transmitted disease, although it is associated with sexual activity.

## Incubation period

*(time between becoming infected and developing symptoms)*

The cause is not yet understood, so the time between whatever changes cause bacterial vaginosis and development of symptoms is unknown.

## Infectious period

*(time during which an infected person can infect others)*

Not transmitted to sexual partners.

## Treatment

Bacterial vaginosis is not usually treated unless symptoms are a problem. Several treatments are available, both vaginal creams and tablets. Women with bacterial vaginosis may be at slightly increased risk of complications in pregnancy or of developing infections after gynaecologic surgery and should discuss the need for treatment with their doctor.

Vinegar or Aci-Jel vaginal jelly help to control symptoms but are not useful for treatment or prevention.

## Control of spread

- > Sexual partners do not need to be treated.

# Barmah Forest Virus Infection

This is an illness caused by infection with the Barmah Forest virus, which is related to Ross River virus.

The infection is spread by mosquitoes from infected animals to humans. Native animals, such as wallabies and kangaroos, are thought to be the main animals involved in the cycle of infection. When a female mosquito feeds on the blood of an infected animal, the mosquito may become infected with the virus. The virus may then be passed on to humans or other animals when the mosquito feeds again. Direct person-to-person spread does not occur.

Many people infected with the Barmah Forest virus will not develop any symptoms, but others may develop:

- > rash, usually on the trunk or limbs
- > joint pain, which may persist for more than six months
- > tiredness and weakness
- > joint swelling and stiffness
- > flu-like symptoms, with fever, chills and headache
- > muscle aches and pain
- > swollen lymph glands.

Diagnosis is made by blood tests. Other illnesses with similar symptoms may need to be excluded.

Most people will recover completely within a few weeks but in a few the symptoms may persist for several months, and very rarely for more than a year. A full recovery can be expected.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 7 – 10 days, but may be up to 21 days.

## Infectious period

*(time during which an infected person can infect others)*

Direct person-to-person spread does not occur.

## Treatment

There is no specific treatment available for this infection. Paracetamol may be used to treat pain and fever.

## Control of spread

- > Exclusion from child care, preschool, school or work is not necessary.
- > Self protection from mosquito bites is the key to prevention.
- > There is no vaccine to prevent human infection of Barmah Forest virus infection by mosquitoes. Personal protection and the environmental management of mosquitoes are therefore essential.

## Personal protection

- > Cover up with long, loose fitting clothing of sufficient thickness to prevent mosquitoes biting through the fabric.
- > Avoid exposure outdoors when mosquitoes are most active.
- > Use an insect repellent containing DEET or Picaridin (the most effective repellents contain 5-20% di-ethyl-N-toluamide or DEET) on exposed skin. Apply in accordance with the manufacturer's instructions. Avoid using on babies and toddlers.
- > Use flyscreens and mosquito nets in accommodation where there are no flyscreens, especially for babies. (This is particularly important when camping out, as repellents are only effective for around four hours).
- > Avoid mosquito-prone areas.

# Barmah Forest Virus Infection (cont.)

## Control of spread cont.

### General mosquito control measures – eliminating mosquito breeding sites

Mosquitoes breed in still water (fresh, salty or stagnant). Stop mosquitoes breeding by cleaning up mosquito breeding sites around the home:

- > Dispose of all containers which hold water, or cover or put holes in them.
- > Empty pot plant drip trays once a week or put sand around pot bases to absorb water.
- > Empty bird baths and pets' drinking water at least every three days.
- > Boats, canoes and dinghies should be overturned or have the drain plug removed so that they do not hold water after rain.
- > Screen all openings to tanks, wells or other large water containers with wire gauze no coarser than 1mm mesh.
- > Keep roof gutters in good repair and regularly remove leaves and debris so that pools of water do not form.
- > Dispose of all waste water in such a way that no ponding occurs. Keep all open drains and channels free from obstruction, especially weeds, grass and other debris.
- > Keep fish ponds, ornamental ponds, dams and unused swimming pools stocked with fish which will eat mosquito larvae. Goldfish or Australian native fish are recommended.
- > Keep swimming pools disinfected or salted.

- > **Avoiding Mosquito Bites page 27**

### Useful website

- > **Fight the Bite**  
<http://www.health.sa.gov.au/PEHS/publications/mozzies-fight-bite.htm>



**Barmah Forest virus infection is a notifiable disease**

# Blastocystis Infection

*Blastocystis* is a single-celled parasite which is commonly found in people who have diarrhoea or other intestinal symptoms. There is a great deal of debate about whether *Blastocystis* causes illness or not. Often there is another cause of the symptoms which has not yet been found.

In fact, there is not much that is known with certainty about *Blastocystis* and research is under way to try to understand what it is and what it does.

Symptoms which may be caused by *Blastocystis* include:

- > watery or loose bowel motions or diarrhoea
- > abdominal pain
- > itching around the anus (back passage)
- > weight loss
- > excess gas.

However, many people in whom *Blastocystis* is found have no symptoms at all.

Diagnosis is made by microscopic examination of a stool specimen.

*Blastocystis* is found throughout the world, especially in developing countries, and occurs in humans and many other types of animals. It is not known how the infection is transmitted, but it may be through contaminated food and water.

## Incubation period

*(time between becoming infected and developing symptoms)*

Unknown. *Blastocystis* may remain in the intestines for years.

## Infectious period

*(time during which an infected person can infect others)*

It is not known if person-to-person spread occurs.

## Treatment

Some people's symptoms respond to a short course of an antibiotic such as metronidazole; others do not. Most infections will eventually go away without any treatment.

## Control of spread

- > As it is not known how the infection is spread, the best advice is to maintain good personal hygiene practices, prepare food carefully and avoid drinking water that may not be clean.

- > **Preventing Food Poisoning at Home**  
page 15

- > **Collecting a Faecal Sample** page 155

# Campylobacter Infection

*Campylobacter* infection is a bacterial infection which most commonly causes gastroenteritis but may also cause illness affecting the entire body.

Symptoms may include diarrhoea (loose bowel movements which may sometimes be bloody), fever and stomach cramps. Vomiting is not common. The most severe infections occur in the very young, the elderly and malnourished people.

*Campylobacter* infection is the commonest precursor illness for Guillain-Barré Syndrome, a condition which causes muscular paralysis.

The infection is diagnosed by growing the bacteria from a specimen of faeces sent to a laboratory.

Eating contaminated food is the most frequent cause of this infection. *Campylobacter* is common on raw poultry. Infected infants, household pets (especially puppies and kittens), domestic stock and contaminated water are also occasional sources of infection.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 2 – 5 days, with a range of 1 – 10 days.

## Infectious period

*(time during which an infected person can infect others)*

A person is infectious for as long as the *Campylobacter* bacteria are in their faeces, which may be for an average of two to three weeks after symptoms are gone. The risk of infecting others decreases when diarrhoea is no longer present.

## Treatment

Antibiotic treatment is not usually needed for *Campylobacter* infection. Recovery from symptoms usually occurs within a few days. There are several treatments that are useful for gastroenteritis of any cause.

The following are general recommendations for the treatment of gastroenteritis:

- > Give plenty of fluids. Oral rehydration solution is highly recommended for children with mild to moderate dehydration. It is available at pharmacies and should be administered following the instructions on the packaging.
- > Mildly unwell children should be given their usual fluids more often. Carbonated (fizzy) drinks or undiluted juice should be avoided.
- > Medicines to prevent vomiting or diarrhoea should not be given (especially in children), except where specifically advised by a doctor.
- > Breastfed babies should continue to be breastfed throughout their illness.
- > Children on formula or solid diets should restart their normal diet (including full strength lactose containing milk) following rehydration with oral rehydration solution.
- > Children who are hungry or ask for food should be given small portions of their usual foods, but avoid foods high in sugar or fat.

Seek medical advice if there are any of the following symptoms:

### Adults

- > signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, feeling faint on standing
- > fever
- > severe abdominal pain
- > bloody diarrhoea.

### Children

- > signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, sunken eyes, feeling faint on standing
- > fever
- > abdominal pain
- > bloody diarrhoea
- > any symptoms in a child less than 12 months of age.

### Control of spread

- > Wash hands after handling raw meat, especially poultry, and keep food preparation areas clean.
- > Wash hands after gardening or touching animals.
- > Meat, particularly poultry, should be thoroughly cooked.
- > Do not store uncooked poultry or other meat near foods which will be eaten raw, such as salad items.
- > If pets are sick with diarrhoeal illness, have them treated.
- > Exclude from child care, preschool, school and work until there has been no diarrhoea for 24 hours. If working in a child care, health care or commercial food setting, the exclusion period should be 48 hours.



***Campylobacter* infection is a notifiable disease**

- > Hand Hygiene page 13
- > Preventing Food Poisoning in the Home page 15
- > Collecting a Faecal Sample page 155

# Candidiasis (Thrush) – vulvovaginal

Thrush is a very common vaginal infection, caused by an overgrowth of yeasts which live normally in the bowel and may be present in other parts of the body, such as the mouth, skin and vagina. The most common cause of thrush is *Candida albicans*, but other types of yeast sometimes are involved.

*Candida* is usually present in small numbers and does not cause symptoms. Sometimes, overgrowth of *Candida* occurs and symptoms develop. Also, some women may be more sensitive than others to the presence of *Candida* and can develop symptoms even when only small numbers of yeast are present.

Symptoms of thrush in women include:

- > vaginal itch, discomfort or irritation
- > vaginal discharge
- > redness and/or swelling of the vagina or vulva
- > stinging or burning when passing urine.

Thrush is not the only cause of symptoms like these. Other conditions such as genital herpes or urinary tract infection may have similar signs, so it is important to have the diagnosis confirmed.

Candidiasis is diagnosed by microscopic examination and growth of yeast from a swab from the vagina.

Circumstances that encourage the overgrowth of *Candida albicans* include:

- > hormonal changes (for example, pregnancy or the oral contraceptive pill)
- > antibiotic treatment
- > diabetes
- > immune suppression (for example, HIV infection, treatment for some cancers, use of steroids).

Candidiasis is not considered to be a sexually transmitted infection.

## Incubation period

*(time between becoming infected and developing symptoms)*

The yeasts which cause thrush may be present all the time. It is changes in the woman's body which allow the condition to develop.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread does not usually occur.

## Treatment

Effective treatments with vaginal creams and vaginal tablets are available.

Patients with frequently recurring candidiasis should seek medical advice to make sure that they do not have a medical condition such as diabetes. Additional treatment with oral tablets may be required.

There is no evidence that dietary changes help prevent thrush.

## Control of spread

- > Male sexual partners of women with candidiasis do not require treatment, except very occasionally when a woman has recurrent infections.
- > Always wipe from front to back after using the toilet, to avoid spreading yeast from the anus to the vagina.

# Cat-Scratch Disease

Cat-scratch disease is a bacterial disease caused by *Bartonella henselae*. It is usually benign and self-limited – that is, most people will not become very ill and will get over the infection without any specific treatment. Most people with cat-scratch disease have a history of contact with cats, especially less than one year old, and the cats almost always appear healthy. The disease is more common in children than adults, probably because children tend to have closer contact with cats and kittens.

The first sign of cat-scratch disease is a small lump or pustule (pimple) at the site of a cat scratch or bite, developing within a few days, though often it is so minor that it is forgotten. After another one to seven weeks, swelling of lymph glands in the region of the scratch will occur. So, for example, if the scratch was on the arm, as is often the case, glands in the armpit on the same side of the body will swell. The lymph glands are usually painful, and may be as large as 6cm in diameter. A mild fever is not uncommon and, very rarely, other symptoms may occur.

It is important to rule out other causes of swollen lymph glands, so if you have any, see your doctor.

Diagnosis is made on history and clinical symptoms as well as by a blood test. Sometimes a doctor will consider it necessary to take a sample of a swollen lymph node and examination of this may also confirm cat-scratch disease.

Cat-scratch disease usually gets better by itself over several months. The infection may be more serious in people who have problems with their immune systems.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 3 – 10 days for the first symptoms (the lump at the site of the scratch or bite), and another 1 – 7 weeks until the lymph gland swelling occurs.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread does not occur.

## Treatment

As cat-scratch disease tends to get better by itself and people with the disease are usually not very ill, specific antibiotic treatment is usually not necessary.

## Control of spread

- > Avoid cat bites and scratches – don't 'play rough' with cats or kittens.
- > Wash cat bites and scratches immediately with soap and running water.
- > Don't allow cats to lick any open wounds you may have.
- > Control fleas in your pets – even though cat-scratch disease doesn't seem to be passed to humans by flea bites, there is evidence that it is spread between cats by fleas.

> [Animal Bites and Scratches page 31](#)

# Chickenpox and Shingles

Chickenpox (varicella) is a viral infection caused by the varicella-zoster virus. Symptoms include slight fever and cold-like symptoms, followed by a rash. The rash appears as blisters which crust to form scabs (colour plate no.1). Crops of blisters may appear over several days and various stages of blisters may be present. The rash is more noticeable on the trunk than on the limbs and may affect the scalp and the inside of the mouth, nose, and throat. The rash is usually itchy.

In childhood, chickenpox is usually a mild illness and can be so mild it might not be noticed. Infection in adults is uncommon, since more than 95% of Australians get the infection in childhood, but infection in adults is more severe and may be complicated by pneumonia.

Chickenpox may be particularly severe in children with leukaemia, pregnant women and young babies. If chickenpox occurs in early pregnancy, the foetus may also be infected, resulting in congenital malformations in up to 2%. If it occurs around the time of delivery, the baby may become infected and up to 30% of newborns will become severely ill.

Chickenpox has a typical appearance and is usually diagnosed by clinical examination. A blood test can detect if someone has protection from chickenpox infection in the past, but the test may not be helpful in determining if there is adequate immunity to varicella following vaccination.

Chickenpox is spread when mucous membranes (lining of nose and mouth) come into contact with the virus in airborne droplets produced by coughing or sneezing, or with fluid from the blisters. Following infection, the virus will remain dormant (resting, as if asleep) in nerve cells of the spinal cord for the rest of the person's life. Reactivation of this virus causes shingles rather than a second attack of chickenpox.

Shingles (herpes-zoster) follows a previous chickenpox infection, usually several decades later. Shingles occurs when the body's immunity to the virus drops and the virus becomes active again after resting in the spinal cord. The elderly, children and adults being treated for cancer and persons infected with HIV virus are at greater risk of developing shingles.

A blistering rash, usually associated with severe pain, occurs on bands of skin overlying the area supplied by the spinal nerves carrying the dormant virus. The rash may be followed by persistent pain in the area, lasting for weeks.

The varicella-zoster virus is present in the shingles blister fluid. Direct contact with the blister fluid can cause chickenpox in a non-immune person. There is no airborne droplet spread from cases of shingles, except perhaps in some very severe cases of disseminated (widespread) shingles. Contact with chickenpox or shingles cannot lead to shingles in the exposed person since shingles can only follow the reactivation of a previous chickenpox infection.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 3 weeks, usually 14 – 16 days, but may be longer.

## Infectious period

*(time during which an infected person can infect others)*

For chickenpox, from 2 days before the rash appears until at least 5 days after the rash first appears and all blisters have crusted over. For shingles, a person is infectious from when the rash appears until all blisters have dried up.

## Treatment

Specific antiviral treatment for both chickenpox and shingles is available. Treatment is only given to those with severe disease or at risk of severe disease, and to be effective must be commenced early, usually within 24 hours of onset of the rash. Medical advice should be sought if:

- > a child or adult with chickenpox has a high fever, cough, shortness of breath, or chest pain
- > a pregnant woman has chickenpox
- > a newborn baby (up to one month of age) is exposed to chickenpox
- > a person over 50 years of age has shingles
- > chickenpox develops in a child or adult with an immune deficiency (including a history of leukaemia, even if in remission).

## Chickenpox and Shingles (cont.)

For all cases, calamine lotion or promethazine [phenergan] (available from pharmacies) may be useful for the itch. If treatment to reduce temperature or discomfort is necessary, paracetamol is recommended.

**! Aspirin should not be given to children or adolescents who have chickenpox or shingles.**

### Control of spread

- > Vaccination against varicella is recommended in the National Immunisation Program: South Australia for children at 18 months of age and for Year 8 students who have not previously had the vaccine or chickenpox infection. A few people who have been vaccinated may still get chickenpox, but the illness will usually be mild. A combination Measles-Mumps-Rubella-Varicella vaccine may become available in the near future.
- > Exclude persons with chickenpox from child care, preschool, school or work until all blisters have dried (usually about five days). Note that some remaining scabs are not a reason for continued exclusion.
- > Any person with an immune deficiency (for example, leukaemia) or receiving chemotherapy should be excluded from contact with a case of chickenpox or shingles for their own protection.
- > Wash hands after contact with soiled articles (tissues etc.). Keeping areas clean, especially where articles have been soiled with nose and throat discharges, will limit the spread of infection. Dispose of tissues appropriately.
- > Persons with shingles should cover the rash with a dry bandage to ensure that others are not exposed.
- > Varicella-zoster immunoglobulin (VZIG) is made from blood products and contains antibodies to the varicella-zoster virus. VZIG is effective in preventing or reducing the severity of chickenpox if given to non-immune people within 96 hours of exposure to a case of chickenpox or shingles.

### Control of spread cont.

People at high risk of complications from chickenpox infection – for example, people with leukaemia, young babies or pregnant women - should seek medical advice regarding VZIG if they have been exposed to a person with chickenpox or shingles. Only people without a history of chickenpox, and with no evidence of immunity on blood testing, need to receive VZIG. VZIG is only of value if given before chickenpox occurs and is of no use in treatment of chickenpox or shingles.

- > Several studies have shown that varicella vaccine is effective in preventing varicella infection, particularly moderate to severe disease, following exposure. This is generally successful when given within three days, and up to five days, after exposure, with earlier administration being preferable (*Australian Immunisation Handbook 9th edn*).
- > A vaccine to prevent shingles has recently been licensed in Australia. It is recommended for adults aged 60 years and over.

**! Varicella infection (chickenpox or shingles) is a notifiable disease**

- > Immunoglobulin page 6
- > Keeping Areas Clean page 14
- > Immunisation page 21
- > Human Immunodeficiency Virus Infection (HIV) page 81

# *Chlamydia trachomatis* Infection

*Chlamydia trachomatis* infection, caused by a bacterium, is the most common sexually transmitted infection in Australia. It occurs in both men and women, though up to 25% of infected men and 70% of infected women may not have any symptoms, and may not know they have the infection. This doesn't mean the infection is trivial. Also, having any sexually transmitted infection increases the risk of getting HIV infection if you are exposed to HIV while another infection is present.

In men, *Chlamydia* may produce a urethritis (infection of the urethra, the urinary canal leading from the bladder to exit at the tip of the penis). A discharge from the penis may be present but many infections have no symptoms. Occasionally, infection may spread to the epididymis (storage tubes for sperm overlying the testes in the testicle), which can be very painful and may lead to infertility.

Although most infected women are without symptoms, it is women who suffer the most serious consequences of genital *Chlamydia* infections. In women, the cervix (opening of the uterus at the top of the vagina) becomes infected. From the cervix, the infection may spread to the fallopian tubes, which are tubes leading from the ovary to the uterus, causing pelvic inflammatory disease (PID). Pelvic inflammatory disease due to *Chlamydia* is often without symptoms but if untreated may lead to scarring of the fallopian tubes and ectopic (tubal) pregnancy or infertility.

*Chlamydia trachomatis* can cause conjunctivitis, inflammation of the lining of the eyelids and eye, in both adults and babies. Babies born to infected mothers can become infected as they pass through the infected cervix and may develop conjunctivitis or pneumonia caused by *Chlamydia* soon after birth.

A small proportion of people infected with *Chlamydia trachomatis* develop joint pain.

Having *Chlamydia* infection does not result in immunity, and re-infection is common. It is likely that the most serious complications – infertility, PID and blindness – are the result of repeated infections.

*Chlamydia* infection is best diagnosed by examination and culture of a sample of cervical or urethral discharge. PCR tests on urine specimens may be used for screening in people without symptoms. The infection cannot be diagnosed from a blood test.

## Incubation period

(time between becoming infected and developing symptoms)

1 – 3 weeks.

## Infectious period

(time during which an infected person can infect others)

Unknown, probably many months if untreated.

## Treatment

Effective antibiotic treatment is available on prescription from a doctor. However, if infertility develops, there is no simple treatment.

## Control of spread

- > Practise safer sex.
- > No sex, or use condoms, until antibiotic treatment is completed.
- > A follow-up test must be done to make sure that treatment has cleared the infection.
- > Testing and treatment of sexual partners at the same time.
- > Testing to exclude other sexually transmitted diseases is advisable.



***Chlamydia trachomatis* infection is a notifiable disease**

- > PCR page 6
- > Avoiding Sexually Transmitted Infections (STI) page 20

## Useful websites

- > Clinic 275  
<http://www.stdservices.on.net/>
- > SHine SA  
<http://www.shinesa.org.au/go/information-and-resources/choose-a-topic/sexually-transmitted-infections>

# Cholera

Cholera is an acute diarrhoeal illness caused by some strains of the bacterium *Vibrio cholerae*. Infection occurs when the bacteria are taken in by mouth, usually in food or water contaminated by human faeces. Infection is often mild, or without any symptoms, but it can be severe.

Symptoms include:

- > sudden onset of painless, profuse, watery diarrhoea
- > nausea and vomiting early in the illness
- > dehydration.

In severe untreated cases, death may occur within hours, but with simple treatment, full recovery can be expected.

The cholera organism is known to be present in some rivers along the eastern Australian coast, but there has not been a locally acquired infection since 1977. In Australia, because of our high standards of sanitation, water and food quality, cholera outbreaks do not occur. Cases are seen only in travellers arriving from countries where the disease is still common, such as Africa, Central Europe, Latin America and Asia.

Cholera is spread by:

- > drinking contaminated water
- > eating food contaminated by dirty water, soiled hands or flies
- > eating fish or shellfish from contaminated waters.

The cholera organism can survive for long periods in water and ice.

Diagnosis is suspected on clinical signs and confirmed by growing the *Vibrio cholerae* organism from a faecal specimen.

## Incubation period

*(time between becoming infected and developing symptoms)*

A few hours to 5 days, usually 2 – 3 days.

## Infectious period

*(time during which an infected person can infect others)*

During the acute stage and for a few days after recovery. However, some people (called 'carriers') who do not have symptoms may still carry the bacteria and be infectious, sometimes for months to years.

## Treatment

Although cholera can be life-threatening, it is easily treated by immediate rehydration, that is, replacement of the fluid and salts lost through diarrhoea.

Oral rehydration fluid is recommended. This can be obtained from pharmacies.

Patients with severe dehydration or who are unable to keep oral fluids down require hospitalisation and intravenous fluid replacement. Anyone who has been in a high-risk region within the previous five days and develops severe vomiting and diarrhoea should seek urgent medical assessment.

Antibiotics shorten the duration of the illness and lessen the severity, but they are not as important as rehydration.

## Control of spread

- > Exclude from child care, preschool, school and work until there has been no diarrhoea for 24 hours. If working in a child care, health care or commercial food setting, the exclusion period should be 48 hours.
- > Follow good hand washing procedures.
- > Severely ill patients should be isolated in hospital.
- > People who are less severely ill can be nursed at home. Faeces and vomit can be disposed of into the toilet except in areas where there is not an adequate sewage disposal system.
- > All linen and articles used by the patient should be washed in hot soapy water and the room thoroughly cleaned when the person has recovered.

### Control of spread cont.

- > Vaccines are available but are recommended only for some travellers to high-risk countries. They may not protect against all strains of cholera bacteria and protection is for several months only.
- > When travelling to high-risk countries, seek advice from a travel medicine clinic or an experienced general practitioner on how to protect yourself from cholera and other diarrhoeal illnesses. In particular, drink only water that has been boiled or disinfected with iodine or chlorine tablets. Carbonated bottled drinks are usually safe, if no ice is added.
- > Good food handling procedures should always be followed, including when travelling.
- > Contacts (for example, family members) of a case should be observed for five days from the date of the last exposure to the infected person.



### Cholera is a notifiable disease

- > [Hand Hygiene page 13](#)
- > [Overseas Travel page 26](#)
- > [Collecting a Faecal Sample page 155](#)

# Common Cold

The common cold may be caused by any of over 100 known cold viruses. Symptoms include:

- > runny nose
- > sneezing
- > coughing
- > mild sore throat
- > watery eyes
- > feeling unwell.

Fever is very uncommon, especially in people over three years of age. Most people will recover within 10 days.

Newborn babies are protected for about the first six months of life by antibodies from their mothers. After this, young children are very susceptible to colds because they haven't built up immunity, they have close contact with adults and other children, they can't practise good personal hygiene and they have tiny nose and ear passages which are easily blocked.

It is not abnormal for children to have five or more colds a year.

It is a myth that people get colds because of a weakened immune system. Healthy people with normal immune systems will almost always become infected if the virus enters their noses – sometimes they may not develop any symptoms.

Getting a cold has nothing to do with being cold or chilled and there is no scientific evidence that 'feeding a cold' (or 'starving a fever') makes the slightest difference to how long it lasts.

Spread is by contact with droplets from the nose of infected people and can be spread indirectly by contact with hands, tissues or other articles soiled by nose and throat discharges.

## Incubation period

*(time between becoming infected and developing symptoms)*

1 – 3 days.

## Infectious period

*(time during which an infected person can infect others)*

From about 1 day before symptoms begin and for the first 5 days of the illness.

## Treatment

There is no specific antiviral treatment against the viruses which cause colds. Paracetamol and other medications available from pharmacies may provide relief of symptoms.



**Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

## Control of spread

- > Wash hands after contact with soiled tissues or with nose and throat discharges.
- > Cover your mouth and nose when sneezing or coughing.
- > Exclusion from child care, preschool, school or work is not necessary, but a person with a cold should stay home until they feel well.

- > [Hand Hygiene page 13](#)

# Conjunctivitis

An inflammation of the lining of the eye and eyelid caused by bacteria, viruses, chemicals or allergies (colour plate no. 3).

Symptoms may include:

- > redness in the whites of the eyes
- > irritation in one or both eyes
- > discharge, causing the eyelids to stick together in the morning
- > swelling of the eyelids
- > sensitivity to light.

Diagnosis is made by clinical and/or microscopic examination and culture of discharge from the eye. It is usually not possible to tell whether the conjunctivitis is caused by bacteria or viruses without laboratory tests.

Viral and bacterial conjunctivitis can be spread by direct contact with eye secretions or indirectly by contact with towels, washcloths, handkerchiefs and other objects that have been contaminated with eye secretions. In some cases it can be spread by insects such as flies. Conjunctivitis caused by chemicals or allergies is not infectious.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 24 – 72 hours.

## Infectious period

*(time during which an infected person can infect others)*

While the eye discharge is present.

## Treatment

Antibiotic eye drops or ointment may be prescribed by a doctor. Since bacterial and viral infections look the same, a person with symptoms of conjunctivitis should always be seen by a doctor for examination, diagnosis and treatment.

## Control of spread

- > Exclude from child care, preschool, school or work until discharge from the eyes has ceased.
- > Good personal hygiene (careful hand washing, using soap and warm water) must be followed.
- > Do not share towels and wash cloths.

- > [Hand Hygiene page 13](#)

# Creutzfeldt-Jakob Disease and variant Creutzfeldt-Jakob Disease

These are progressive fatal infections of the brain caused by an infectious protein particle called a prion. These diseases are some of a group of brain infections known as Transmissible Spongiform Encephalopathies (TSE).

Creutzfeldt-Jakob disease (CJD) is a very rare illness, affecting about one person per million population worldwide, and has been recognised for about 80 years. In almost all cases the source of infection is not apparent – these are called sporadic cases. Some cases (albeit a small number) are the result of a genetic abnormality and run in families. An even smaller number have been linked to medical treatment such as use of human pituitary hormones, corneal transplants or neurosurgery. Most cases occur in people over 50 years of age and symptoms include a rapidly progressive dementia, confusion and unsteadiness.

Since 1995 a new disease similar to classic CJD has been recognised, known as variant Creutzfeldt-Jakob disease (vCJD). To date there have been about 150 probable or proven cases, most of which have occurred in the United Kingdom. It is believed almost all of these cases are related to a massive epidemic of Bovine Spongiform Encephalopathy (BSE, commonly known as ‘mad cow disease’) in the United Kingdom which peaked in 1992-1993. People become infected by eating cattle products contaminated with the BSE prion. vCJD has several important differences to CJD, such as:

- > It affects much younger people. The average age of death of people with classic CJD is 68 years, but for vCJD it is 28 years. We do not yet know the reason for this.
- > It generally begins with different symptoms to CJD, with psychiatric and sensory disturbances being prominent.

There have been recent reports of transmission of vCJD by blood transfusion.

The diagnosis is suggested by clinical symptoms, electroencephalogram (EEG, recording of the electrical activity of the brain) and brain scans (such as Magnetic Resonance Imaging), but at present can only be confirmed by laboratory examination of brain material or in the case of vCJD, also by biopsy of the tonsils.

Currently there is no available vaccine or treatment and these conditions appear to be inevitably fatal.

## Incubation period

*(time between becoming infected and developing symptoms)*

For CJD, from 15 months to more than 30 years. The incubation period for vCJD is unknown, because it is a new disease, but it is thought to be also from years to decades.

## Infectious period

*(time during which an infected person can infect others)*

Routine social or community contact with a person with CJD or vCJD carries no risk of spread. Infected brain tissue is infectious before and during the presence of symptoms.

## Control of spread

- > Strict adherence by health care institutions to infection control guidelines for the management of surgical equipment.
- > Body tissues or blood from persons with symptoms suggestive of CJD or vCJD must not be used for transplantation or transfusion.
- > Human-derived pituitary hormone products are no longer used for treatment and people who have received them must not donate blood. These people should also notify hospitals that they have been treated with human pituitary hormones if they are going to have surgery.
- > Livestock herds infected with BSE are slaughtered and incinerated, and animals with symptoms suggestive of BSE are not permitted to enter the food chain.
- > Beef from countries where BSE is known to occur is subject to quarantine.
- > Rules on the composition of livestock feeds must be adhered to.

**! Creutzfeldt Jakob Disease and variant Creutzfeldt Jakob Disease are notifiable diseases**

- > **Handling Blood and Other Body Substances page 19**

# Cryptosporidiosis

Cryptosporidiosis is an infection of the bowel caused by the parasite *Cryptosporidium*.

The main symptom is watery diarrhoea which occurs with stomach cramps. Fever, vomiting and loss of appetite occur less commonly. People with normal immune systems may have symptoms which usually last for about one to two weeks. People with severe immune suppression, particularly those with late stage AIDS, may have severe, prolonged diarrhoea.

The infection is diagnosed by examining a specimen of faeces under a microscope.

This parasite may be transmitted person-to-person. Infection is also spread directly, by drinking or swimming in contaminated water, eating uncooked food (fruits and vegetables) contaminated with *Cryptosporidium* or indirectly, when hands, objects and surfaces are contaminated with faeces of infected people or animals (cows and other domestic animals). The parasite must be taken in by the mouth to cause infection.

## Incubation period

*(time between becoming infected and developing symptoms)*

1 – 12 days.

## Infectious period

*(time during which an infected person can infect others)*

As soon as the infected person develops symptoms and for up to several weeks after the disappearance of symptoms.

## Treatment

For those with normal immune systems, specific treatment is not required.

If there is diarrhoea, drink lots of fluids.

There is no available effective treatment for reducing diarrhoea in people with immune suppression.

## Control of spread

- > Exclude from child care, preschool, school and work until there has been no diarrhoea for 24 hours. If working in a child care, health care or commercial food setting, the exclusion period should be 48 hours.
- > Wash hands thoroughly with soap and water; always wash hands before handling or eating food, after using the toilet or when changing nappies, even if you are wearing gloves.
- > Do not consume untreated ice or drinking water when travelling in countries where the water supply might be unsafe.
- > Avoid eating uncooked foods when travelling in countries with minimal water treatment and sanitation systems.
- > Wash and/or peel all raw fruits and vegetables before eating.
- > Do not swallow recreational water (pools, lakes, rivers, springs, ponds and streams).
- > People who have diarrhoea should not use public swimming pools for 14 days after the symptoms have stopped.
- > Avoid touching farm animals, especially young calves and lambs.
- > Filtration of water in treatment plants is the most effective barrier to transmission of *Cryptosporidium* in water. It is highly resistant to chemical disinfectants used to purify drinking water.
- > People with weakened immune systems, particularly people with HIV and AIDS, should consider additional strategies to avoid infection:
  - Drink only treated water. There is no general advice to avoid drinking treated mains water. However, if you wish to take extra precautions, you may wish to boil your water before drinking.



***Cryptosporidium* infection is a notifiable disease**

- > Hand Hygiene page 13
- > Keeping Areas Clean page 14
- > Collecting a Faecal Sample page 155

# Cytomegalovirus (CMV) Infection

An infection caused by cytomegalovirus (CMV). This virus occurs worldwide and humans are the only source of human CMV.

Infection in children and adults is usually without symptoms. Occasionally, symptoms similar to glandular fever can occur. In certain groups, infection can result in severe disease.

These groups are:

- > infants infected before, during, or shortly after birth
- > people who have had a transplant, either solid organ or bone marrow/ stem cell
- > people with severe immune suppression such as AIDS.

Once someone has been infected with CMV, they are thought to remain infected for life, even though they usually won't have any symptoms. People can become infected with a number of different strains of the virus. Also, especially during periods of illness or stress, the virus can reactivate, and may or may not cause symptoms.

Diagnosis in infants is made by growing the virus, usually from urine. Diagnosis in adults is more complicated and usually requires growing the virus, blood tests or PCR tests.

The method of spread of the infection varies. Infants usually acquire the infection while in the uterus or during passage through the birth canal. Young children are frequently infected by contaminated saliva when sucking and sharing toys. People with weakened immune systems may have a return of a previous infection with CMV (reactivation) or may be infected with a new strain of the virus. CMV can be transmitted during blood transfusions and organ transplants.

Infection of a baby before birth can result in serious congenital abnormalities, with highest risk during the first half of the pregnancy and in women who have not previously been infected. CMV infection occurs in 1% or less of pregnancies, and of these cases less than 10% are likely to have severe illness. In developed countries more than half the population carry CMV virus by the time they reach adulthood, though this figure is much higher in developing countries.

## Incubation period

*(time between becoming infected and developing symptoms)*

3 – 12 weeks.

## Infectious period

*(time during which an infected person can infect others)*

The virus is often shed for months in urine or saliva following infection in children and adults. Infants and immune suppressed adults can shed the virus for months to years following infection or reactivation of infection.

## Treatment

Specific antiviral treatment is available for use in severe CMV infections.

## Control of spread

- > Good hand washing after handling articles contaminated with urine or saliva, particularly after changing nappies.
- > Exclusion from child care, preschool, school or work is not necessary.
- > There is currently no vaccine available to prevent CMV infection.

- > PCR page 6
- > Hand Hygiene page 13
- > Glandular Fever page 61

# Dengue Fever

Dengue fever is an infection caused by dengue viruses, of which there are four different serotypes.

The disease has a sudden onset and symptoms may include:

- > fever for three to seven days
- > intense headache and pain behind the eyes
- > muscle and joint pain
- > loss of appetite
- > vomiting and diarrhoea
- > skin rash
- > bleeding, usually from the nose or gums.

Recovery is sometimes associated with prolonged fatigue and depression. Repeated episodes of dengue fever may result in excessive bleeding and shock but with appropriate treatment are rarely fatal. Dengue fever occurs in tropical and subtropical areas of the world, including northern Australia.

In Australia the dengue virus is transmitted by a bite from the *Aedes aegypti* mosquito. Only the female mosquito transmits the dengue virus. This mosquito is a daytime biter, both inside and outside homes, and is most active in the hours after sunrise and before sunset. Other species of mosquito can transmit the virus but are not presently established in Australia.

*Aedes aegypti* mosquitoes breed inside and outside the home in containers holding water and rarely fly more than 200 metres from the breeding site. They do not breed in creeks, swamps, pools or other bodies of water.

Diagnosis of dengue fever is made by clinical examination and a blood test.

## Incubation period

*(time between becoming infected and developing symptoms)*

3 – 14 days, commonly 4 – 7 days.

## Infectious period

*(time during which an infected person can infect others)*

A mosquito becomes infected if it bites an infected person while the fever is present (an average period of about 3 – 5 days). After biting an infected person it takes 8 – 12 days before the mosquito can infect other people. The mosquito remains infectious for life. Dengue is not directly spread from person-to-person.

## Treatment

There is no specific antiviral treatment available. General recommendations include controlling fever and pain with paracetamol rather than aspirin (aspirin may promote bleeding), and increasing fluid intake.

## Control of spread

- > Prevent access of mosquitoes to an infected person with a fever.
- > Protect yourself from mosquito bites at all times in dengue areas:
  - Wear loose fitting, light coloured clothing covering up as much of the body as possible. Mosquitoes can bite through tight fitting clothing, e.g. jeans.
  - Use insect repellents containing either:
    - > DEET (Diethyl toluamide). Always read the manufacturers instructions prior to application. Wash DEET off before going to bed in the evening. Do not use on infants if the DEET concentration exceeds 20%, or
    - > Picaridin, to cover areas of exposed skin.
  - Use 1mm insect screens on your house, boat, caravan or tent. If this is not possible, use a mosquito net.



**Dengue is a notifiable disease**

- > Serotype page 6
- > Overseas Travel page 26
- > Avoiding Mosquito Bites page 27

# Diphtheria

An infection of the throat and nose caused by the bacterium *Corynebacterium diphtheriae*.

Occasionally these bacteria can cause skin infections, usually in people with poor health or poor hygiene.

Symptoms include sore throat, swollen neck glands and a discharge from the nose. The bacteria can also produce a toxin capable of damaging nerves or the heart.

Diphtheria is suspected when a white or grey membrane is seen on the back of the throat and is confirmed when the bacteria are seen under the microscope and grown in the laboratory.

The disease is spread directly from person-to-person, by contact with airborne droplets from the nose or throat, or indirectly by contact with sores, or articles soiled with discharges from the nose or throat.

Diphtheria has been rare in Australia since the introduction of an effective vaccine but a century ago was the most common infectious cause of death. Outbreaks still occur in countries where vaccination rates are not high.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 2 – 5 days.

## Infectious period

*(time during which an infected person can infect others)*

Without antibiotic therapy, usually less than 2 weeks, occasionally as long as 6 months.

A person is no longer infectious after treatment with appropriate antibiotics.

## Treatment

Specific treatment with antibiotics and an antidote to the toxin is available.

## Control of spread

- > Widespread immunisation against diphtheria is the only effective control. Diphtheria vaccine is one of the components of vaccines routinely administered to children at two, four and six months of age, with booster doses at four years and 15 to 17 years (in South Australia this booster is offered to Year 9 school students). Adults should receive a further booster at age 50. For adolescents and adults, the combined diphtheria-tetanus-pertussis vaccine (dTpa) is preferred, if not given previously, as it provides additional protection against pertussis (see information on Immunise Australia website below).
- > People with diphtheria need to be kept in isolation until they are proven to be free of the disease.
- > Contacts (those having close physical association) of people with diphtheria need to be investigated for the disease, receive antibiotics and receive vaccination.
- > Family or household contacts should be excluded from school, preschool or child care until cleared to return by an appropriate health authority.
- > Contacts whose work involves food handling or caring for unimmunised children are excluded from work until they are proven to be free of infection.
- > People travelling to countries where diphtheria is common should receive a full immunisation course or a booster dose of vaccine (if a full course has already been completed). This is currently recommended for travellers to Southeast Asia, the Russian Federation, the Ukraine, Baltic countries and Eastern Europe.



**Diphtheria is a notifiable disease**

- > **Immunisation page 21**

## Useful website

- > **Immunise Australia**  
<http://www.immunise.health.gov.au>

# Fleas

Fleas are wingless biting insects which are common pests on domestic cats and dogs, as well as other animals.

Fleas from dogs, cats, rats and mice very rarely spread diseases such as plague, typhus and tapeworms to humans. They are however predominantly considered annoying to both people and pets.

Fleas are hatched from eggs which are laid in an animal's fur by an adult flea. The eggs fall from the pet and land on surfaces like bedding, carpeting or the soil in the animal's environment. The eggs hatch into a larva, which then changes into another form called a pupa, and eventually these turn into adults. The time for this process varies depending on a number of factors, and in cool temperatures can take up to a year. Fleas tend to be more common during the warmer seasons.

Only adult fleas bite humans. Flea bites commonly cause skin irritation with itching. Some people and pets suffer from flea bite allergy, with intense itching, hair loss, reddening of the skin and sometimes infection.

## Control of spread

- > The best approach to managing fleas is prevention. New safe and effective products for controlling fleas on pets have made this process much easier, and use of insecticidal sprays is now seldom necessary.
- > Contact your veterinarian for advice on selecting the best flea treatment for your pets.
- > If fleas become a problem, treat the pet's environment at the same time as the pet.
- > Frequently vacuum floors, upholstered furniture and areas where pets may sleep indoors.
- > Treat animal bedding by boiling, or use of animal-safe insecticides – use only products that are recommended for use with animals, and consult your veterinarian first if you are in doubt.
- > Animals with fleas should also be treated for tapeworm.
- > Further advice on methods of treatment can be obtained from the environmental health officer at your local council, or a commercial pest control company.

# Food Poisoning

Food poisoning is an illness caused by eating contaminated food. The most common sources of contamination are bacteria or toxic substances produced by bacteria. Some viruses and fungi can also cause food poisoning.

Typical symptoms are a sudden onset of nausea, vomiting, stomach cramps and diarrhoea. The illness usually lasts from less than 24 hours to several days depending on the cause. Occasional severe cases last longer and may require hospitalisation. While single cases of food poisoning undoubtedly occur, they are difficult to detect and frequently go unreported. Food poisoning is usually recognised as a typical illness occurring in a group of people shortly after eating a common food.

Detection of large numbers of certain bacteria in suspect food samples and detection of the same bacteria in samples of faeces from affected people confirm the diagnosis of food poisoning.

Bacteria may contaminate food as a result of farming or other production methods, poor preparation, handling or storage of food. Contaminated food may not look, smell or taste any different from food that is safe.

## Incubation period

*(time between becoming infected and developing symptoms)*

Varies depending on the cause, but usually from a few hours to a few days. Although many ill people blame a food they ate before they got ill, experience indicates that this food is usually not the cause of the illness.

## Infectious period

*(time during which an infected person can infect others)*

Depends on what has caused the illness. Not all causes of food poisoning are able to be spread from person-to-person, but some are.

## Treatment

Treatment varies depending on what is the cause of the food poisoning. Usually these illnesses do not require antibiotic treatment.

## Control of spread

- > If the cause is not known, it should be assumed that it may be possible to spread from person-to-person, or for an infected person to contaminate food and indirectly infect others. Therefore:
  - Follow good hand washing and keeping areas clean procedures
  - Exclude from child care, preschool, school or work until there has been no diarrhoea or vomiting for 24 hours. If working in a child care, health care or commercial food setting, the exclusion period should be 48 hours
  - Good food handling procedures should always be followed
  - People who have diarrhoea should not use public swimming pools until there has been no diarrhoea for at least 24 hours.



**Food poisoning is a notifiable disease**

- > [Hand Hygiene page 13](#)
- > [Keeping Areas Clean page 14](#)
- > [Preventing Food Poisoning at Home page 15](#)
- > [Collecting a Faecal Sample page 155](#)

# Fungal Infections of the Hair, Skin or Nails (Ringworm, Tinea, Athlete's Foot)

These infections are commonly called 'ringworm', but are not caused by worms. They are superficial infections of the skin, hair or nails caused by a variety of fungi which otherwise live in the soil, on animals, or sometimes only on people.

Often these infections are localised to specific parts of the body:

- > Scalp and beard (colour plate no. 5)
  - begins as a small pimple which spreads outwards, leaving a scaly hairless patch. Infected hairs become brittle and break off easily.
- > Toenails and fingernails (colour plate no. 4)
  - usually involves one or more nails of the hands and feet, most often the feet. The nail gradually thickens, becomes discoloured (white or yellowish) and brittle. Cheesy material forms beneath the nail or the nail becomes chalky and disintegrates.
- > Skin (other than scalp, bearded areas and feet) (colour plate no. 15)
  - appears as a flat, spreading ring-shaped lesion. The edge is usually reddened and may be dry and scaly or moist and crusted. The centre of the patch may appear to be normal skin.
- > Foot (tinea, athlete's foot) (colour plate no. 18)
  - appears as scaling or cracking of the skin, especially between the toes. It is often very itchy.

These infections are diagnosed by clinical examination and by examining small samples of skin, hair or nail under the microscope, then by growing the fungus. Knowing which fungus is causing the infection gives information on what treatments are best and how to prevent new infections occurring. For example, if the cause is a fungus which normally lives on animals, it may be necessary to treat pets in the household. Sometimes a dog or cat can have a fungal infection which causes only mild symptoms in it, but is much more irritating in people. It is also possible for pets to get infections from their owners!

Infections are spread by direct skin contact (with humans or animals), or indirectly from contaminated articles or floors, or the soil. Shared changing rooms and showers are often a source of tinea, while some infections are spread by sharing of items such as towels. People shed tiny pieces of skin all the time and if these contain a small amount of the fungus, it is able to survive in the environment and cause infection in someone else.

## Incubation period

*(time between becoming infected and developing symptoms)*

Varies with site of infection and the particular fungus.

## Infectious period

*(time during which an infected person can infect others)*

As long as the condition persists untreated. Some treatments will rapidly kill the fungus and prevent spread to others.

## Treatment

Specific antifungal therapies (directly applied to the skin and/or taken by mouth) are available for both humans and animals. Sometimes the treatment must be continued for many months.

## Control of spread

- > Children and adults with fungal hair, skin or nail infection of any site should be excluded from child care, preschool, school or work until the day after appropriate treatment has commenced.
- > Close contacts (people having household or close physical contact) should be inspected for signs of infection.
- > Follow good hand washing, laundering and keeping areas clean techniques. Vacuum floors regularly.
- > Pets can be washed with antifungal washes.

- > **Hand Hygiene page 13**
- > **Keeping Areas Clean page 14**

# Genital Herpes

Genital herpes is an infection of the skin and mucous membranes in the genital and surrounding areas (anus, buttocks and inside of the thighs) caused by the herpes simplex type 1 or 2 viruses. Both types can infect the mouth (producing cold sores) or the genital area (genital herpes). Genital herpes is most often caused by herpes simplex type 2 virus.

When a person is infected with the herpes virus, it may pass unnoticed. This is called *subclinical* infection. Therefore many people with genital herpes are not aware they have the infection.

Symptoms, if they do occur, include small painful blisters that break open to form shallow painful sores or ulcers. The sores scab and heal after one to two weeks. The first attack may be very severe with multiple blisters.

After the first infection, the virus remains in the body for life and may produce sores at a later date. These are called *recurrent outbreaks*. These are usually shorter, not as painful as the first attack, and can be triggered by physical or emotional stress, sunlight, a viral infection, or hormonal changes (including menstruation), but often no trigger can be identified. In the first episode, general flu-like symptoms may occur – feeling unwell, fever, headaches or pains in the back and legs. These symptoms do not usually occur with later outbreaks.

In most cases, recurrent outbreaks become less frequent with time and may eventually stop altogether. Recurrent attacks are caused by reactivation of the virus already present in the body – not by being re-infected.

Herpes simplex virus is usually spread by contact with blisters. However, people with genital herpes can shed the virus from the genital area and infect others even without a blister being present. Cold sores on the mouth are a potential source of genital infection during mouth-to-genital contact (oral sex).

Infection of a baby can occur during vaginal delivery if the mother has genital herpes, particularly if it is the first attack. Babies infected in this way can become severely ill. The obstetrician and midwife should be told of past genital herpes infections so the risk of this complication can be minimised.

Herpes is diagnosed by taking a sample from an infected area during an outbreak. The herpes virus will usually grow from a swab taken from a ruptured blister. The test will identify the strain (type 1 or type 2) of the herpes virus. PCR tests may also be used. Blood tests may assist diagnosis in some cases, but the results can be difficult to interpret.

The presence of genital herpes, or any other STI, increases the risk of contracting HIV infection if you are exposed to HIV while the other infection is present.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 12 days.

## Infectious period

*(time during which an infected person can infect others)*

Spread of infection is most likely when a moist blister is present. However, people with a history of genital herpes may shed the virus (and are capable of infecting others) even without a blister being present.

## Treatment

Specific antiviral therapy is available which can decrease the severity of initial genital herpes infection, decrease the severity of recurrences and if taken continuously, reduce the likelihood of recurrences.

It is not known whether taking antiviral therapy will reduce the chance of infecting others with genital herpes.

For severe infections, salt baths or ice packs may reduce discomfort. Iodine-containing antiseptics such as Betadine will dry out the blisters and may help prevent secondary infection.

There is no evidence that women with a history of genital herpes need to have Pap smears more frequently than other women do.

### Control of spread

- > People should not have genital, oral or anal sex while sores or blisters are present. However, it is important to remember that *it is possible to transmit infection even if there are no obvious blisters, sores or other symptoms.*
- > When blisters are not present, the spread of herpes simplex may be reduced by using condoms or dental dams.
- > Testing to exclude other sexually transmitted infections is advisable.
- > Since herpes in pregnant women may be transmitted to the baby at delivery, the health professional managing the pregnancy should be alerted to a history of past herpes infections so that this complication can be planned for and avoided.

- > PCR page 6
- > Avoiding Sexually Transmitted Infections (STI) page 20

### Useful websites

- > Clinic 275  
<http://www.stdservices.on.net/std>
- > SHine SA  
<http://www.shinesa.org.au/go/information-and-resources/choose-a-topic/sexually-transmitted-infections>

# Genital Warts

This is an infection of the skin and mucous membranes caused by the human papilloma viruses (HPV) of which there are around 100 known strains or types. Genital warts may be small, difficult to see and only detected by medical examination, or they may be much larger, joining to form lesions over a centimetre in diameter.

Infection with some strains of the wart virus is associated with an increased risk for developing cervical cancer in women, and of cancer of the anus, particularly in homosexually active males.

Diagnosis is made by clinical examination. Cervical infection may be detected by a Pap smear.

The disease is usually transmitted by genital or anal intercourse. Babies may develop infection of the respiratory tract during passage through the birth canal of an infected mother.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 3 months, with a range of 1 – 20 months.

## Infectious period

*(time during which an infected person can infect others)*

Unknown, but probably at least as long as a visible wart exists.

## Treatment

There is no 'perfect' treatment for genital warts and not everyone with genital warts requires treatment. The decision should be made after discussion with your doctor about the advantages and disadvantages. Within three to four months, warts will disappear in 10-20% of people even without treatment. There is no strong evidence that treatment eradicates the HPV from the body or stops the transmission of infection. However, treatment may improve local symptoms and be desirable for cosmetic and psychological reasons.

Small warts can be removed easily by applying specific chemical paint to the wart. Several treatments are given, after which the warts usually disappear within a few weeks.

Because this solution may burn the nearby skin, it is applied carefully by a health worker and is not given to patients for self-application. Chemical paint is not applied to the cervix or used for pregnant women.

If genital warts are larger they may be frozen off or treated by diathermy or laser treatment. Sometimes, if the warts are very large, they are best removed surgically.

## Control of spread

- > Practise safer sex – use condoms or dental dams.
- > Sexual partners of persons with genital warts should be examined for evidence of warts, including a Pap smear for women.
- > Women should have a Pap smear every two years from the age of 18 years, or two years after having sex, whichever is later.
- > Testing to exclude other sexually transmissible diseases is advisable.
- > A vaccine is now available that can prevent infection from HPV types that are known to cause cervical cancer and genital warts. Vaccination is currently available for females aged 10-26 years of age. In South Australia, girls are offered the HPV vaccine in Year 8 at school. The vaccine is delivered through the School Based Immunisation Program or available at local council immunisation clinics. Women who are fully immunised with HPV vaccine should continue to have regular Pap smears. For more information see the website below.

- > **Avoiding Sexually Transmitted Infections (STI) page 20**

## Useful websites

- > **Clinic 275**  
<http://www.stdservices.on.net/std>
- > **Immunisation Service, SA Health**  
<http://www.health.sa.gov.au/pehs/immunisation/071105-hpv-leaflet-web.pdf>
- > **SHine SA**  
<http://www.shinesa.org.au/go/information-and-resources/choose-a-topic/sexually-transmitted-infections>

# Giardiasis

An infection of the bowel caused by the parasite *Giardia duodenalis*, also known as *Giardia lamblia* or *Giardia intestinalis*. This parasite is a single-celled organism and is found worldwide. Although it occurs in many animals including dogs, cats, sheep and cattle there is still some uncertainty about the extent of disease transmission between people and animals.

Symptoms include:

- > stomach cramps
- > excessive gas or bloating
- > diarrhoea, which may be watery, usually lasting one to several weeks
- > frequent loose or pale, greasy stools which may float in the toilet bowl
- > fatigue
- > weight loss
- > lactose intolerance may occur in 20 – 40% of cases and last several weeks.

Fever and bloody diarrhoea are not usually seen with *Giardia* infections. Many infected people have no symptoms. The infection is diagnosed by examining the faeces under a microscope.

Spread takes place when hands, objects or food become contaminated with faeces of infected people or animals, or by drinking contaminated water. The parasites must be taken in by mouth to cause infection. In institutions and preschool centres, person-to-person transmission may be a significant means of spreading the illness. Transmission can occur with some sexual practices where there is contact with faecal matter. Re-infection can occur.

## Incubation period

*(time between becoming infected and developing symptoms)*

3 – 25 days or longer (usually 7 – 10 days).

## Infectious period

*(time during which an infected person can infect others)*

For as long as the organism is present in the faeces (often months), whether or not the person is ill. A person with diarrhoea is more likely to spread infection than a well person, but a person without symptoms is still potentially infectious to others.

## Treatment

Treatment of an ill person with appropriate antibiotic medication relieves symptoms and usually makes the person non-infectious within a few days.

## Control of spread

- > Exclude from child care, preschool, school or work until there has been no diarrhoea or vomiting for 24 hours. If working in a child care, health care or commercial food setting, the exclusion period should be 48 hours
- > Follow good hand washing procedures.
- > Water suspected of contamination should be boiled before drinking.
- > Treatment of infected people reduces spread.

- > **Hand Hygiene page 13**
- > **Collecting a Faecal Sample page 155**

# Glandular Fever

An infection caused by the Epstein Barr virus (EBV). It is also called Infectious Mononucleosis and sometimes the 'Kissing Disease'. Once a person catches Epstein Barr virus, it is believed that the virus remains in their body for life, though it usually does not cause further illness. By adulthood, 90-95% of people have EBV.

Symptoms of acute glandular fever include:

- > fever
- > sore throat
- > swollen glands
- > abdominal pain and jaundice (yellowing of skin and eyes) occur less frequently.

Symptomatic infection most often occurs in older children and young adults. When the infection occurs in young children, symptoms are mild or absent. Up to 50% of people infected have no symptoms of infection at all. The illness can last between one and several weeks and very rarely a chronic form develops. Illness can be more severe in those who have lowered immunity and in some ethnic groups serious complications may occur many years after the initial infection.

The diagnosis is made by a blood test.

The disease is spread from person-to-person through contact with saliva. Young children may be infected by saliva on the hands of care givers or by sucking and sharing toys, but the virus does not survive very well in the environment. Kissing results in spread among young adults.

## Incubation period

*(time between becoming infected and developing symptoms)*

4 – 6 weeks.

## Infectious period

*(time during which an infected person can infect others)*

Not accurately known. The virus is shed in the saliva for up to a year after illness and intermittently thereafter.

## Treatment

Seek medical advice if difficulty with swallowing or abdominal pain occurs. Medication for control of fever may be required. There is no effective antiviral drug available. Contact sports and heavy lifting should be avoided for the first month after illness because of risk of damage to the spleen, which often is enlarged during acute infection. Most patients with glandular fever recover uneventfully.



**Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

## Control of spread

- > People with glandular fever do not need to be excluded from school or work. They should return whenever they feel able.
- > Follow good hand washing techniques.
- > Minimise contact with saliva.
- > Avoid sharing cups and glasses.
- > There is no vaccine available to prevent Epstein Barr virus infection.

# Gonorrhoea

Gonorrhoea is a serious infection of the genital tract in both men and women, caused by a bacterium *Neisseria gonorrhoeae*, sometimes called the gonococcus. Gonorrhoea is transmitted sexually, by oral, anal or genital sex.

Both men and woman may have gonorrhoea without having any symptoms and so can be infected, or spread infection, without knowing anything is wrong.

Symptoms that may occur include:

- > *In men*, urethritis (infection of the urethra, the urinary canal leading from the bladder to exit at the tip of the penis). There may be:
  - discharge of pus from the penis
  - a burning sensation in the penis when urinating.

Some men never develop symptoms, but most do.

- > *In women*, gonorrhoea usually affects the cervix (opening of the uterus at the top of the vagina) causing:
  - vaginal discharge
  - discomfort on urination
  - bleeding between periods, often after having sex.

However, there may be only mild symptoms or no symptoms at all.

- > In women infection may spread from the cervix to the Fallopian tubes (tubes leading from the ovaries to the uterus), causing pelvic inflammatory disease (PID). PID due to gonorrhoea is often without symptoms, but there may be:
  - fever
  - low abdominal pain
  - pain on intercourse
  - if untreated, PID may lead to scarring of the Fallopian tubes and ectopic (tubal) pregnancy or eventual infertility.

- > *In both men and women* throat and anal infections can occur following receptive oral and anal intercourse and infections at these sites are often without symptoms.
- > Joint pain and infection (arthritis).
- > *In adults and children* conjunctivitis (inflammation of the lining of the eyelids and eye) may occur. Babies born to infected mothers can become infected as they pass through the infected cervix and may develop gonococcal conjunctivitis soon after birth.

Diagnosis is made by microscopic examination and growth of bacteria from a sample of discharge from the cervix or urethra, or specimens from the throat, rectum, eye or joints. Newer molecular tests such as PCR on urine may be used to screen people with no symptoms.

Having any sexually transmitted infection increases the risk of HIV infection if you are exposed to HIV virus while the other infection is present.

## Incubation period

*(time between becoming infected and developing symptoms)*

1 – 10 days, sometimes longer.

## Infectious period

*(time during which an infected person can infect others)*

Months if untreated.

## Treatment

Effective antibiotic treatment is available on prescription from a doctor. After treatment, a follow-up test is done to make sure the infection has been cured.

Treatment is simple if given soon after infection. Infections may cause lifelong complications, particularly in women, if not diagnosed and treated early.

### Control of spread

- > Practise safer sex.
- > No sex (abstinence), or use condoms or dental dams, until antibiotic treatment is completed and a follow-up test has been done to make sure that treatment has cleared the infection.
- > Testing and treatment of sexual partners at the same time.
- > Testing to exclude other sexually transmitted disease is advisable.



**Gonorrhoea is a notifiable disease**

- > PCR page 6
- > Avoiding Sexually Transmitted Infections page 20

### Useful website

- > Clinic 275  
<http://www.stdservices.on.net>

# Haemolytic Uraemic Syndrome (HUS) and Shiga Toxin Producing *Escherichia coli* (STEC)

*Escherichia coli* (*E. coli*) is a bacterium commonly found in the faeces of people and many animals. Most *E. coli* found in the gut are harmless but some may produce toxins such as Shiga toxin, which can cause disease.

Infection with Shiga Toxin Producing *Escherichia coli* (STEC) may produce no symptoms, or people may have:

- > simple diarrhoea
- > bloody diarrhoea
- > abdominal cramps
- > often there is little or no fever or vomiting.

A small percentage of patients with STEC may develop haemolytic uraemic syndrome (HUS) in which there is kidney disease and damage to other organs, including the pancreas and brain. Children and the elderly are especially susceptible.

Diagnosis is made by growing the bacteria in a stool specimen, or by a PCR test on the stool specimen. Blood tests may provide additional clues to the diagnosis.

Usually *E. coli* that carry Shiga toxin genes cause isolated infections, but occasionally outbreaks occur. The common sources of STEC infections include:

- > eating raw or undercooked beef mince
- > eating uncooked fermented meat products (for example mettwurst and salami)
- > eating vegetables and fruit juices contaminated with animal faeces
- > contact with farm animals
- > swallowing contaminated water.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually ranges from 3 – 8 days but may be longer.

## Infectious period

*(time during which an infected person can infect others)*

This may be as long as 3 weeks.

## Treatment

Treatment for complications such as dehydration and kidney failure may require hospitalisation, sometimes in intensive care. As a rule, antibiotics should not be used.

## Control of spread

- > All animal products, particularly from cattle and sheep, which are not thoroughly cooked or pasteurised may harbour STEC or other harmful bacteria.
- > Avoid cross contamination in the kitchen. Keep raw meats including pet meat away from items that won't be cooked, and use hot water and detergent to thoroughly wash knives, trays, chopping boards, and any other surfaces or items that might be contaminated.
- > All fruits and vegetables including lettuce and sprouts, especially if consumed raw, should be protected from contamination from raw meat or its juices and should be washed before consumption.
- > Meat should be cooked thoroughly, until the juices run clear.
- > Don't drink unpasteurised milk or juices.
- > Hand washing will prevent most person-to-person transmission. Hands should be washed after contact with animals (especially farm animals), after visiting petting zoos, before preparing or eating food and after using the toilet.
- > Toddlers who are not toilet trained should not use swimming pools and when faecal accidents occur, swimming pools should be properly disinfected.
- > Exclude from child care, preschool, school and work until there has been no diarrhoea for 24 hours. If working in a child care, health care or commercial food setting, the exclusion period should be 48 hours



**HUS and STEC are notifiable diseases**

- > PCR page 6
- > Hand Hygiene page 13
- > Keeping Areas Clean page 14
- > Collecting a Faecal Sample page 155

# Haemophilus influenzae type b (Hib)

Before the widespread use of Hib vaccine, *Haemophilus influenzae* type b was the commonest cause of bacterial meningitis in young children in Australia. Other serotypes of *Haemophilus influenzae* (not type b) are found in the nose and throat of up to 80% of healthy people and can also cause infections, though they do not commonly cause meningitis.

*Haemophilus influenzae* type b can cause a number of serious infections, including:

- > meningitis, an infection of the tissues lining the brain. Meningitis often follows an upper respiratory infection
- > bloodstream infection (bacteraemia)
- > epiglottitis (swelling of part of the throat which may result in obstruction to breathing)
- > pneumonia (lung infection)
- > bone and joint infections
- > cellulitis (infection of tissue beneath the skin).

In infants, symptoms of meningitis include:

- > fever
- > refusing feeds
- > fretfulness
- > child is difficult to wake
- > high-pitched or moaning cry
- > pale or blotchy skin
- > seizures.

In older children and adults, symptoms of meningitis include:

- > headache
- > fever
- > vomiting
- > stiff neck or back
- > joint pains
- > drowsiness or confusion
- > discomfort on looking at bright lights.

Symptoms of epiglottitis include:

- > fever
- > sore throat
- > dribbling (unable to swallow saliva)
- > difficulty in swallowing and breathing.

Children or adults with these symptoms should receive urgent medical assessment.

Diagnosis is made by growing bacteria from the blood, CSF (fluid surrounding the brain and spinal cord) or other specimens.

The disease is spread directly from person-to-person, by contact with airborne droplets from the nose or throat, or indirectly, by contact with articles soiled with discharges from the nose or throat.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 4 days.

## Infectious period

*(time during which an infected person can infect others)*

As long as the bacteria are present in the nose and throat. Hib is not able to be spread after 1 – 2 days of appropriate antibiotic therapy.

## Treatment

A child with Hib will be treated in hospital with antibiotics.

### Control of spread

- > Vaccination against Hib is routinely given to all children starting at two months of age and is recommended for all children under five years of age. It is also recommended for older persons who have no spleen or who receive stem cell transplants.
- > While immunisation is highly effective in protecting young children against serious Hib infections, occasional cases still occur in vaccinated children.
- > Under certain circumstances, Public Health authorities may recommend that an antibiotic such as rifampicin is given to members of a household where there is a serious Hib infection, or to staff and other children attending the same child care centre.
- > A child who has serious Hib infection cannot return to school or child care until they have taken at least four days of an appropriate antibiotic course.



**Hib is a notifiable disease**

- > **Serotype page 6**
- > **Immunisation page 21**

# Hand, Foot and Mouth Disease

A viral infection usually caused by the coxsackie A virus; occasionally it is caused by other viruses such as an echovirus or enterovirus.

Symptoms include a slight fever, tiredness, loss of appetite, blisters in the mouth and on the hands and feet (colour plate no. 6) and a sore mouth for a few days before the ulcers or blisters appear. Affected young children may refuse to eat or drink.

Diagnosis is usually made by clinical examination.

Spread takes place through contact with the fluid in the blisters. This is most likely to occur when the virus becomes airborne during coughing and talking. Contact with faeces can also spread the infection.

## Incubation period

*(time between becoming infected and developing symptoms)*

3 – 5 days.

## Infectious period

*(time during which an infected person can infect others)*

As long as there is fluid in the blisters. The faeces can remain infectious for several weeks.

## Treatment

Usually none is required. Use of paracetamol for the fever and any discomfort may be indicated.



**Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

## Control of spread

- > Exclude from child care, preschool and school until all blisters have dried.
- > The blisters should not be deliberately pierced or broken because the fluid within the blisters is infectious. The blisters will dry naturally.
- > Follow good hand washing techniques and keeping areas clean procedures.

- > [Hand Hygiene page 13](#)
- > [Keeping Areas Clean page 14](#)

# Head Lice

Head lice are small wingless biting insects which live and breed in human hair and feed by sucking blood from the scalp (colour plate no. 8). Many lice infestations cause no symptoms and probably less than half cause itching, so you have to look at the hair to see if lice are present (colour plate no. 7).

Use a bright light or sunlight to inspect the hair. You may see small white or brown oblong eggs ('nits') attached to the shafts, and they are difficult to move. The live lice are more difficult to find as they move rapidly away from disturbances in the hair. Adult lice are 2-4mm long and whitish brown in colour.

The best way to check for head lice is to apply a generous amount of hair conditioner (any brand will do), then dry the hair and comb through with a coarse comb to detangle the hair. The conditioner stuns head lice for about 20 minutes. Then use a very fine toothed comb and comb the hair through, wiping it on a tissue regularly so you can check for lice and their eggs

Spread is by direct head-to-head contact with a person who has head lice, or more rarely by contact with items such as combs, brushes, hats, scarves or pillowcases which have been recently used by someone with head lice.

Some animals have lice, but lice which live on animals will not live on humans.

## Incubation period

*(time between becoming infested and developing symptoms)*

The eggs usually hatch in 7 – 10 days.

## Infectious period

*(time during which an infested person can infect others)*

As long as the eggs or lice are alive. Once hatched, the lice are capable of laying eggs after 10 days and lice live for up to 35 days on the scalp. They do not survive more than 2 days away from a human host.

## Treatment

A number of head lice treatments are available without prescription. Follow directions on the packaging. Family members may also need treatment.

Seek medical advice before using treatments on pregnant or breastfeeding women, infants under two years old or people with sensitive skin or dermatitis.

Re-treatment after seven to 10 days is necessary because lice in unhatched eggs may not be killed by the first treatment.

If infestations persist despite correct insecticide use, medical advice should be sought on alternative methods of treatment.

Using conditioner and a fine tooth comb once a week may help to detect infestations early and minimise spread from person-to-person.

## Control of spread

- > Family and close contacts should be inspected for signs of infestation and treated if infested.
- > A child with head lice does not need to be sent home from child care or school immediately but should be treated on the same day. Children may return to school the day after appropriate treatment has been given.
- > Concentrate on the head. It is not necessary to treat the house or classroom.
- > Combs and brushes should be cleaned with detergent and hot water.
- > Bed linen should be washed in hot water (60°C or more), or dried in a clothes dryer on the hot setting for at least 20 minutes.

### Useful websites

- > Healthy Heads without Headlice program  
<http://www.health.sa.gov.au/pehs/branches/headlice/headlice-index.htm>
- > Guidelines for the control of public health pests – lice, fleas, scabies, bird mites, bed bugs and ticks  
<http://www.health.sa.gov.au/pehs/environ-health-index.htm>



**Outbreaks of head lice are common in children in schools and institutions everywhere. They infest people of all socio-economic positions and age groups.**

# Hepatitis A

An infection of the liver caused by the hepatitis A virus.

Symptoms include:

- > abdominal pain
- > loss of appetite
- > weight loss
- > nausea (and sometimes vomiting)
- > fever and chills
- > mild headache
- > tiredness
- > yellow skin and eyes  
(jaundice – colour plate no. 10)
- > dark urine and pale faeces.

Older children and adults are more likely to have symptoms lasting one to two weeks, or in severe cases, up to several months. Children under age three rarely have symptoms.

The diagnosis is made by a blood test.

The infection is spread when traces of faeces (containing hepatitis A virus) contaminate hands, objects, water or food and the virus is then taken in by mouth. Hepatitis A virus is extremely durable in the environment. In Australia, most cases of hepatitis A are associated with day care centres enrolling children not yet toilet trained, sexual and household contacts of people infected with hepatitis A, overseas travel to high risk countries or illicit drug use. It is occasionally transmitted in sexual activity where faecal-oral contact occurs and rarely is transmitted by blood transfusion.

Most people recover fully and after infection will have life-long immunity. Death from hepatitis A is rare.

## Incubation period

*(time between becoming infected and developing symptoms)*

Generally 15 – 50 days, usually 28 – 30 days.

## Infectious period

*(time during which an infected person can infect others)*

A person is most infectious in the 2 weeks before symptoms occur and is slightly infectious during the first week of symptoms.

## Treatment

There is no specific antiviral treatment for hepatitis A. Rest, good fluid intake and alteration in diet may decrease symptoms. Severely ill people require admission to hospital.

## Control of spread

- > Follow good personal hygiene practices, especially thorough hand washing.
- > Good food handling procedures should always be followed.
- > An infected person should be excluded from child care, preschool, school or work for seven days after the onset of jaundice or illness.
- > Hepatitis A vaccine is offered to non-immune household and/or sexual contacts of all cases of hepatitis A who have had contact during the two weeks before, until one week after the onset of jaundice. If contacts are under one year of age, are immunosuppressed, have chronic liver disease or for whom vaccine is contraindicated, normal human immunoglobulin can be offered. Immunoglobulin is a solution containing human antibodies, made from blood products. If given within two weeks after exposure, vaccine or immunoglobulin will prevent or decrease the severity of symptoms of hepatitis A. Contacts (including those given vaccine or immunoglobulin) may remain infectious to others even if they do not develop symptoms themselves and should therefore continue to follow good personal hygiene practices.
- > If a person with hepatitis A is a food handler by occupation, vaccine (or immunoglobulin if in one of the groups for whom vaccine is not recommended) should be administered to the other food handlers employed in the same establishment.
- > Under certain circumstances vaccine (or immunoglobulin) may be offered to staff and children at child care facilities.
- > The hepatitis A vaccine provides protection against hepatitis A infection within two weeks of administration and long-term protection (longer than 10 years) if a booster dose is administered.

## Control of spread cont.

- > Vaccination is recommended in the following groups:
  - travellers to areas where hepatitis A is common
  - Aboriginal and Torres Strait Islander children residing in the Northern Territory, Queensland, South Australia and Western Australia
  - those whose occupation may put them at risk of acquiring hepatitis A (those living and working in rural and remote indigenous communities, child day care and preschool personnel, carers of people with intellectual disabilities, health care workers who regularly provide care for Aboriginal and Torres Strait Islander children, plumbers or sewage workers, and sex workers)
  - those whose lifestyle may put them at risk of acquiring hepatitis A (injecting drug users and men who have sex with men)
  - people with intellectual disabilities
  - people chronically infected with either hepatitis B or hepatitis C viruses
  - people with chronic liver disease.
- > Combined hepatitis A/hepatitis B vaccine should be considered for:
  - expatriates and long-term visitors to developing countries
  - medical, dental and nursing undergraduate students
  - men who have sex with men
  - sex industry workers
  - inmates and staff of long-term correctional facilities
  - injecting drug users
  - patients with chronic liver disease and/or hepatitis C
  - solid organ transplant recipients
  - residents and staff of facilities for people with intellectual disabilities.



**Hepatitis A is a notifiable disease**

- > **Immunoglobulin page 6**
- > **Hand Hygiene page 13**
- > **Immunisation page 21**
- > **Overseas Travel page 26**

# Hepatitis B

Infection with the hepatitis B virus (HBV) causes inflammation of the liver.

Hepatitis B is spread when infectious body fluids (blood, saliva, semen and vaginal fluid) come into contact with body tissues beneath the skin (for example, through needle puncture or broken skin) or mucous membranes (for example, eyes, nose, mouth or genitals). In Australia most infections are associated with:

- > immigration from a high prevalence country
- > sharing injecting equipment
- > unprotected sex (anal and vaginal)
- > mother-to-baby transmission at or around the time of birth
- > child-to-child contact usually through contact between open sores or wounds
- > tattooing
- > body piercing
- > household contact – sharing razors and toothbrushes
- > needle stick injuries to health care workers
- > blood splash to mucous membrane, for example, nose, mouth or eyes
- > receiving blood or blood products before screening was introduced in 1971.

The risk of spread is increased when there are higher levels of virus in the blood. The level of virus varies considerably between people infected with hepatitis B.

*Acute infection:* About 50% of adults and 90% of children do not develop any symptoms at the time of infection.

Symptoms, if they occur, may include:

- > fever
- > loss of appetite
- > nausea and vomiting
- > abdominal pain (especially in the right upper abdomen)
- > yellow skin or eyes (jaundice) (colour plate no. 10)
- > dark coloured urine and pale stools
- > muscle and joint pain
- > rash.

Acute infection may be followed by chronic infection. People unable to eliminate the hepatitis B virus from their body following an acute infection and who remain infected for more than six months are said to have chronic hepatitis B (are hepatitis B carriers).

*Chronic infection:* Risks for developing chronic infection are:

- > age
  - 90% of infants will develop chronic infection following acute infection
  - only 1-10% of older children or adults will develop chronic infection
- > immune deficiency.

Most of the chronically infected people (carriers) have no symptoms but are capable of spreading the infection to others. Carriers have an increased risk of developing cirrhosis (scarring) of the liver and liver cancer later in life.

Both acute and chronic hepatitis B infections are diagnosed by blood tests. If liver inflammation continues, a needle may be inserted into the liver to obtain a sample of tissue for further testing.

## Incubation period

*(time between becoming infected and developing symptoms)*

Between 45 – 180 days, and rarely from as early as 2 weeks to as late as 9 months.

## Infectious period

*(time during which an infected person can infect others)*

From up to 3 months before symptoms develop until the infected person eliminates the virus from their body. Chronically infected people remain infectious for life although the risk of transmitting the infection to others varies considerably from person to person.

## Treatment

Specific antiviral treatment is available and will benefit some people with chronic hepatitis B infection. Long-term follow-up of chronic hepatitis B infection by a general practitioner or liver specialist is recommended.

### Control of spread

- > Effective vaccines are available and are routinely given within seven days of birth, followed by further doses at two, four and six months.
- > In South Australia there is a two-dose school based program for children in Year 8 which will continue until children vaccinated at birth reach this year level.
- > Courses of three injections over six months can be given at other ages for people who have not previously been vaccinated. Completion of a full course of vaccine will give protection against hepatitis B infection in more than 90% of people.
- > All women are tested for hepatitis B infection during pregnancy. If a mother is found to be a hepatitis B carrier, her baby is given immunoglobulin and a course of hepatitis B vaccination commencing within 24 hours of birth. With this treatment less than 10% of infants will become infected with hepatitis B.
- > Hepatitis B immunoglobulin and vaccine are also offered to non-immune people having close physical contact with a person known to be infected with hepatitis B in the following situations:
  - after needle sharing or needle stick injury
  - after sexual exposure.
- > Immunoglobulin is offered after needle stick injuries unless the source is known to be negative for hepatitis B. Hepatitis B immunoglobulin is a solution containing high levels of antibodies specific to hepatitis B and is made from blood products. It should be administered within 72 hours after a needle stick injury and within 14 days after sexual exposure.
- > Exclusion from child care, preschool, school or work is not necessary.

### Control of spread cont.

- > Infected health care workers must comply with the requirements of their professional boards.
- > Any open sores, cuts or abrasions should be covered with waterproof dressings.
- > All donated blood and organs are screened for evidence of hepatitis B infection.
- > Practise safer sex – use condoms consistently and correctly.
- > Injecting drug users should never share injecting equipment.
- > If required to handle blood or body fluids, the use of Standard Precautions will reduce the risk of transmission of hepatitis B virus.
- > Hepatitis B vaccination is also recommended for:
  - household contacts of acute and chronic hepatitis B carriers
  - haemodialysis patients, HIV-positive individuals, recipients of certain blood products and other adults with impaired immunity
  - individuals adopting children from overseas
  - health care workers, ambulance personnel, dentists, embalmers, tattooists and body piercers.
- > Combined hepatitis A/hepatitis B vaccines should be considered for:
  - expatriates and long-term visitors to developing countries
  - medical, dental and nursing undergraduate students
  - men who have sex with men
  - sex industry workers
  - inmates and staff of long-term correctional facilities
  - injecting drug users
  - patients with chronic liver disease and/or hepatitis C
  - solid organ transplant recipients
  - residents and staff of facilities for people with intellectual disabilities.



### Hepatitis B is a notifiable disease

- > Immunoglobulin page 6
- > Handling Blood and Other Body Substances (standard precautions) page 19
- > Avoiding Sexually Transmitted Infections (STI) page 20
- > Immunisation page 21

### Useful websites

- > Immunise Australia Program  
<http://www.immunise.health.gov.au/internet/immunise/publishing.nsf/Content/hep-b>
- > Hepatitis Australia  
[http://www.hepatitisaustralia.com/about\\_hepatitis/hep\\_b.html](http://www.hepatitisaustralia.com/about_hepatitis/hep_b.html)
- > National Hepatitis B Alliance  
<http://alliance.hepatitis.org.au/>

# Hepatitis C

Infection with the hepatitis C virus (HCV) causes inflammation of the liver.

Acute infection is followed by chronic infection in 50-80% of cases. The majority of people exposed to the hepatitis C virus are unable to eliminate the hepatitis C virus from their body following initial (acute) infection and remain infected for life (chronic infection) if not successfully treated. In Australia, many people became infected from the late 1950s onward, but as the virus was only identified in 1989 and a hepatitis C antibody test available from 1990, some people are only now being identified. Some of the people who have had the infection for many years are only now starting to present with symptoms of chronic liver disease.

*Acute infection:* Less than 25% of people with acute infection develop symptoms. These may include:

- > fatigue
- > poor appetite
- > upper right sided abdominal pain
- > low grade fever lasting two to 10 days
- > jaundice (yellow skin and eyes – refer colour plate no. 10)
- > nausea.

*Chronic infection:* Liver function remains normal or only mildly affected in some people with chronic infection, though most will have some liver inflammation. When the liver is inflamed over a long period of time it can develop scar tissue, known as fibrosis. Extensive scarring of the liver is called cirrhosis. It is believed that without treatment, 25% of people with chronic hepatitis C will develop cirrhosis over an average period of 18 years and will have a higher risk of developing liver cancer over the next decade. While many people do not have any symptoms, others may experience a variety of symptoms, including:

- > tiredness and fatigue, which may be severe
- > malaise (general unwellness)
- > pain or discomfort in the upper right side of the abdomen
- > nausea, vomiting and diarrhoea
- > muscle aches
- > a fine body rash.

Hepatitis C is diagnosed by blood tests. There are two types of tests to confirm hepatitis C infection:

- > **Antibody test.** This detects antibodies against hepatitis C virus (anti-HCV) and is the most commonly used test. Antibodies are proteins in the blood which the body produces to try to destroy the virus, although with HCV this is usually not successful. It may take three to six months for these tests to become positive after infection occurs. Anti-HCV antibodies can be detected in 50-70% of patients at the onset of symptoms and in about 90% of patients three months after the onset of infection; therefore a negative antibody result may not exclude acute HCV infection. If the antibody test is positive, it means that the person has been exposed to the hepatitis C virus at some point in their life. A PCR test is necessary to see if the virus is still present and whether the person is still likely to be infectious.
- > **Hepatitis C PCR test (also known as Hepatitis C RNA test or viral RNA test).** This test looks for the genes of the virus, its RNA, in the blood. Hepatitis C viral RNA can be detected within one to two weeks of exposure. Persistence of HCV RNA in the blood, even with the resolution of symptoms, indicates chronic infection. The levels of viral RNA fluctuate over time and may be undetectable even in the presence of active HCV infection. However, repeatedly negative PCR tests are likely to indicate clearance of the virus.

Hepatitis C is spread by blood-to-blood contact through needle puncture, broken skin or a break in mucous membranes. In Australia, most infections are associated with:

- > sharing injecting equipment (even a single episode) – accounts for 90% of new cases each year in Australia
- > immigration from a high prevalence country
- > receiving a blood transfusion or blood product before screening tests became available in 1990
- > tattooing, body piercing or acupuncture with non-sterile equipment and procedures
- > being a prisoner, where there is exposure to a number of risks.

# Hepatitis C (cont.)

The risk of transmission is low in the following situations:

- > Sexual transmission – this has been documented but appears to be rare. However, blood contact during unprotected intercourse should be avoided, for example, during menstruation, when there is broken or inflamed skin, unprotected penetrative intercourse where bleeding is caused, or unprotected anal intercourse. Condoms provide an effective barrier in these situations. Sexual transmission is also more likely to occur when the person has a high viral load, or also has HIV infection.
- > Mother-to-baby transmission – the risk of transmission in pregnancy and childbirth is low unless the mother is also infected with HIV. Women with hepatitis C are not advised to stop breastfeeding unless they have cracked nipples.
- > Household transmission is rare and does not occur through usual family and domestic contact. However, personal grooming items such as razors, nail files, manicure scissors and tooth brushes may contain minute traces of infected blood and should never be shared.

The risk of spread is increased when there are higher levels of virus in the blood. This occurs during acute infection or if the immune system is suppressed, for example, when the person also has HIV infection. People do not appear to develop immunity to HCV infection and can be re-infected with the same or different strains of the virus.

## Incubation period

*(time between becoming infected and developing symptoms)*

6 – 9 weeks, but can range from 2 weeks – 6 months. The majority of infected people do not develop symptoms of acute hepatitis.

## Infectious period

*(time during which an infected person can infect others)*

1 or more weeks before symptoms develop in the acute stage; lifelong in chronic infection.

## Treatment

Improved antiviral therapy is available and new treatments have increased the number of people who have been able to clear the virus and avoid ongoing symptoms and liver damage. People who are infected with hepatitis C should seek advice about minimising further damage to their liver from alcohol and drug use, and infection with any of the other hepatitis viruses. They should seek advice about vaccination against hepatitis A and B. Long-term follow-up of chronic hepatitis C infection by a general practitioner and liver specialist is recommended.

## Control of spread

- > There is currently no vaccine for protection against hepatitis C virus infection. Everyone has a responsibility to help prevent transmission of hepatitis C and to take care of themselves and others. This means:
  - Not sharing or re-using injecting equipment (including not just needles but also syringes, filters, spoons, swabs, tourniquets etc).
  - Avoiding body tattooing or body piercing performed by those who are untrained and unregulated. Sterile technique under sterile conditions in premises which are regularly inspected by Environmental Health Officers is recommended. Equipment, ointments, dyes and dye pot surfaces etc should be sterile. Ask about sterilising procedures.
  - Covering any open sores, cuts or abrasions with waterproof dressings.
  - Always using Standard Precautions if blood or body fluids must be handled. This will minimise and generally eliminate the risk of transmission of hepatitis C.
  - Safely disposing of found or used needles and syringes in a Sharpsafe or other sealable and puncture-proof container.
  - People with HCV or at risk of infection with the virus should not donate blood, organs or other tissue. All donated blood and body organs are screened for HCV infection.

### Control of spread cont.

- > Exclusion from child care, preschool, school or work is not necessary.
- > Infected health care workers must comply with the requirements of their professional boards.
- > There is no evidence that the administration of immunoglobulin after exposure to hepatitis C will prevent infection.



### Hepatitis C is a notifiable disease

- > PCR page 6
- > Handling Blood and Other Body Substances (standard precautions) page 19

### Useful websites

- > Hepatitis C – Information and Services available in 18 languages  
<http://www.dh.sa.gov.au/pehs/topics/topic-hep-c-book.htm>
- > Hepatitis C Council of South Australia  
<http://www.hepccouncilsa.asn.au/>  
– phone 08 8362 8443  
– regional callers 1800 021 133
- > Multicultural Hepatitis C resources  
<http://www.multiculturalhivhepc.net.au/>  
(access to resources in many languages)

# Hepatitis A, B and C Summary

| Disease            | Ways the viruses are spread  | Course and outcome of infection  | Vaccine/ Post Exposure Prophylaxis (PEP) |
|--------------------|--|--|--|
| <b>Hepatitis A</b> | <p><b>Oral-faecal</b></p> <p>Infection occurs when faeces containing the virus are transferred to another person's mouth. In Australia most infections are associated with:</p> <ul style="list-style-type: none"> <li>&gt; contaminated food, drink and eating utensils</li> <li>&gt; hands contaminated by an infected person via nappies, toys or towels soiled with faeces</li> <li>&gt; oral/anal sexual contact</li> <li>&gt; sewage-contaminated water or shellfish</li> <li>&gt; travel to countries with endemic hepatitis A</li> <li>&gt; illicit drug use</li> </ul> <p>Inadequate personal hygiene is responsible for most person-to-person spread</p> | <p><b>Acute infection*</b></p> <p>Symptoms occur in less than 10% of young children and in 40-70% of adults who become infected</p> <p><b>Chronic infection**</b></p> <p>Does not occur in hepatitis A infection</p>   | Yes                                      |
| <b>Hepatitis B</b> | <p><b>Blood-to-blood and sexual contact</b></p> <p>Most infections in Australia are associated with:</p> <ul style="list-style-type: none"> <li>&gt; immigration from a high prevalence country</li> <li>&gt; sharing injecting equipment</li> <li>&gt; unprotected sex</li> <li>&gt; mother-to-baby transmission at or around the time of birth</li> <li>&gt; child-to-child contact</li> <li>&gt; tattooing or body piercing</li> <li>&gt; household contact – sharing razors and toothbrushes</li> <li>&gt; receiving blood or blood products before screening from 1971</li> </ul>   | <p><b>Acute infection*</b></p> <p>Symptoms occur in up to 50% of adults in the period 2 to 3 months after infection</p> <p><b>Chronic infection**</b></p> <p>Develops in:</p> <ul style="list-style-type: none"> <li>&gt; 5-10% of people infected as adults</li> <li>&gt; 30-50% of children infected under 4 years of age</li> <li>&gt; 90% of infants infected in the perinatal period</li> </ul> | Yes                                      |

## Hepatitis A, B and C Summary

| Disease     | Ways the viruses are spread   | Course and outcome of infection  | Vaccine/ Post Exposure Prophylaxis (PEP) |
|-------------|---|--|--|
| Hepatitis C | <p><b>Blood-to-blood contact</b></p> <p>Most infections in Australia are associated with:</p> <ul style="list-style-type: none"> <li>&gt; immigration from a high prevalence country</li> <li>&gt; sharing injecting equipment</li> <li>&gt; receiving blood or blood products before screening from 1990</li> <li>&gt; tattooing, body piercing or acupuncture</li> <li>&gt; being a prisoner</li> </ul> | <p><b>Acute infection*</b></p> <p>15-25% of people will develop symptoms which are usually mild and may include jaundice</p> <p><b>Chronic infection**</b></p> <p>50-80% of people remain chronically infected. 25% of this group will develop scarring of the liver (cirrhosis)</p> | No                                       |

\* Acute infection – the early weeks or months after infection has occurred. Symptoms may include abdominal discomfort, nausea, fever, fatigue, sometimes followed by jaundice (yellow skin and eyes)

\*\* Chronic infection – there may be no symptoms but the person remains infected. Chronic infection may lead to cirrhosis, liver failure or liver cancer in some people

# Herpes Simplex Type 1 (Cold Sores or Fever Blisters)

The commonest symptoms of infection by herpes simplex virus type 1 (HSV1) are cold sores (colour plate no. 2). These are ulcers of the skin or mucous membranes (lining of the nose, mouth or throat).

There are two types of herpes simplex virus, type 1 and 2 (HSV1 and HSV2). Cold sores are usually caused by type 1 while type 2 is more often associated with genital herpes. The virus is spread by skin or mucous membrane contact with infected saliva. People with a history of cold sores may shed the virus in their saliva even without a blister being present. Sometimes these viruses can cause infections of the eyes, hands or brain, and may cause severe illness in pregnant women or people whose immune systems are weakened.

Although HSV1 infection can occur at any age, most people get their first infection in early childhood; frequently symptoms are mild or absent. After the first infection, the virus remains latent (resting) in nerve cells in the brain or spinal cord and is present for life. If the virus becomes active again it results in cold sores, painful clear blisters on a red base, usually on the face or lips. The blisters crust and heal within a few days. The virus can be triggered to become active again by physical or emotional stress, sunlight, a viral infection or hormonal changes. Appearance of the blisters is often preceded by tingling, itching and pain at the site.

Herpes simplex virus infection can be diagnosed by scraping the base of the cold sore and examining cells under the microscope, by growing the virus, or by a PCR test. Blood tests are not usually helpful in diagnosis. About 80% of adults in Australia have antibodies to HSV1 and 25% have antibodies to HSV2.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 12 days

## Infectious period

*(time during which an infected person can infect others)*

Spread of infection is most likely when a moist blister is present. However, people with a history of cold sores may shed the virus in their saliva and are therefore capable of infecting others even without a blister being present.

## Treatment

Specific antiviral therapy is available but is restricted for use in severe cases. (Antiviral therapy for oral herpes is not covered by the Pharmaceutical Benefits Scheme.) Other treatment is available through pharmacies.

## Control of spread

- > Young children unable to follow good hygiene practices should be excluded from child care, preschool or school while the cold sore is weeping.
- > Cold sores should be covered with a dressing where possible.
- > Follow good hand washing techniques.
- > Do not kiss on or near the cold sore.
- > Do not share food or drink containers.
- > Dispose of used tissues correctly.

- > PCR page 6
- > Hand Hygiene page 13
- > Genital Herpes page 57

# Human Immunodeficiency Virus (HIV) Infection

HIV stands for Human Immunodeficiency Virus (HIV). Without treatment, HIV infection will usually result in Acquired Immunodeficiency Syndrome (AIDS). New HIV therapies introduced in the mid 1990s have resulted in much less AIDS-related illness and death. However, HIV remains a life-long infection.

A few weeks after infection with HIV, the infected person may develop an illness (seroconversion illness) which is often mild, consisting of muscle aches, low-grade fever, headaches and sometimes a rash. Swelling of the lymph glands may also occur. This illness at the beginning of the infection is so similar to many other viral infections that the diagnosis of HIV infection may not be made at this time. This flu-like illness may last for a few weeks and then there is a return to seemingly normal health. This period of 'normal' health varies widely between persons. Some experience fairly rapid development of disease due to the HIV infection, whereas others may remain free of any symptoms for many years. When symptoms do eventually develop, they may not be specific and can include chronic loss of appetite, diarrhoea, weight loss, fever, lethargy and fatigue.

HIV destroys certain cells within the immune system (CD4+ or helper T cells) from the time of infection onwards, causing more and more damage. Eventually the point is reached where the damage to the immune system is so great that the body can no longer stop some infections or cancers it normally fights successfully. Infections not usually seen in healthy persons, called opportunistic infections, and certain unusual tumours such as Kaposi's sarcoma, may also occur. Women with HIV infection are at increased risk of developing cervical cancer and both men and women are at increased risk of anal cancer. HIV can cause infection within brain tissue, which can lead to nervous system disorders or dementia in some HIV infected persons.

Without antiviral treatment the majority of people with HIV will develop AIDS and die from infections, cancers and other illnesses that the body's immune system can no longer fight. In countries such as Australia where there is access to HIV treatment, about 80% of people on treatment will have long-term suppression of symptoms and a reduced viral load (the amount of HIV in the blood).

However, treatment outcomes over a whole lifetime are not yet known and drug resistance can emerge which limits the treatment options available to the person. Some of the drugs have significant side effects and all must be taken very accurately, requiring quite some effort on the part of the HIV infected person to take the medications for a long period, and probably for life.

Diagnosis of HIV infection is made using blood tests. A positive blood test indicates the development of antibodies to HIV and therefore the presence of the virus. Antibodies to HIV usually develop within a few weeks to three months. Occasionally this period may be longer. Even though the blood test for antibodies may not be positive during the early stage of infection, the virus will be present in blood and body fluids, making them infectious to other people. PCR tests can be used for the early detection of HIV genetic material in the blood.

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

In Australia, most infections have resulted from:

- > unprotected sex (anal and vaginal intercourse)
- > sharing injecting equipment
- > receiving blood or blood products before the introduction of screening in 1985
- > mother-to-baby transmission during pregnancy, birth or breastfeeding.

*Routine social or community contact with an HIV infected person carries no risk of infection.*

There is no evidence of spread of HIV through social contact in schools, at home or in the work place. HIV has not been transmitted through air or water, swimming pools or toilets, sharing of plates, cups or cutlery, kissing, coughing, sneezing or spitting. In addition, there is no evidence that HIV can be spread by mosquitoes or other biting insects.

# Human Immunodeficiency Virus (HIV) Infection (cont.)

## Incubation period

*(time between becoming infected and developing symptoms)*

Illness may not occur for months or years after HIV infection. Without treatment, most adults will develop severe disease within 10 years of infection. Treatment of HIV with drug therapy has become much more effective in the past few years, prolonging the life of people with this infection, as well as increasing their quality of life. It is uncertain what effect these treatments, or treatments yet to be developed, will have upon long-term HIV infection in any individual.

## Infectious period

*(time during which an infected person can infect others)*

Once a person has been infected with HIV they remain infected for life and are able to transmit the virus to others. Transmitting the infection to another person may be dependent on the level of virus in body fluids of the infected person. The risk is higher when the viral load (the amount of HIV in the blood) is higher, in particular in early infection, when a person may not even be aware they have HIV, and late in infection when the immune system is failing. Even when the viral load (the amount of HIV in the blood) is undetectable by blood tests, some potential for transmission remains.

## Treatment

Specific therapy (antiretrovirals) is available and all people with HIV infection should have access to this treatment. Although available antiretroviral drugs have dramatically improved the outlook for people with HIV, these medications often have side effects and the virus may also develop resistance to the medications. There is no drug yet which can cure HIV infection and no vaccine or immunisation.

When HIV infection is advanced and has caused immune system destruction, secondary infections (opportunistic infections) can occur. Using other antibiotics and antiviral drugs to prevent secondary infection may prevent severe illness and premature death.

Regular assessment is important in monitoring the effects of HIV infection, determining the best time to start therapy and monitoring the effect of therapy or the development of complications.

Measurement of the viral load and the levels of CD4+ cells assists in indicating the effectiveness of treatments.

An infectious diseases specialist or general practitioner with expertise in HIV medicine is recommended to undertake these assessments.

## Control of spread

- > Everyone has a responsibility to help prevent transmission of HIV and to take care of themselves and others. This means:
  - Practising safer sex – use condoms and water based lubricants for penetrative sex. These reduce the risk of getting HIV, as well as other sexually transmitted infections (STIs). Having any STI increases the risk of getting HIV infection.
  - Not sharing injecting equipment (including needles, syringes, filters, spoons, swabs, tourniquets etc).
  - Safely disposing of found or used needles and syringes in a Sharpsafe, or other sealable and puncture-proof container.
  - Always using Standard Precautions if blood or body fluids must be handled. This will minimise and generally eliminate the risk of transmission of HIV.
  - Covering any open sores, cuts or abrasions with waterproof dressings.
  - Understanding the risk of body tattooing or any body piercing. The risk of being infected with HIV through these practices is lower than for hepatitis B or C, but there is still a risk if there is use of unsterile equipment or re-used dyes.
  - People with HIV or at risk of infection with the virus should not donate blood, organs or other tissue. All donated blood and body organs are screened for HIV infection.

### Control of spread cont.

- > 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.
- > If a person is exposed to HIV there is a four-week treatment that may prevent them becoming infected. It is called Post Exposure Prophylaxis (PEP). If a person thinks they have been exposed to HIV, they can call the South Australian 24 hour PEP triage hotline on 1800 022 226, or ask their local doctor, sexual health clinic or emergency department for more information – but they need to do this immediately, because the treatment will not be effective more than 72 hours after exposure. If a person has been exposed through their work (e.g. in health care occupations), PEP assessment should be provided through the Occupational Health, Safety and Welfare procedures at their workplace.
- > Exclusion from child care, preschool, school or work is not necessary. Children with HIV infection may be advised to stay away from school during outbreaks of infectious disease (for example, chicken pox) to prevent them getting more serious infection.
- > Infected health care workers must comply with the requirements of their professional boards.
- > Although there is no HIV vaccine, HIV infections are entirely preventable through safe behaviour.

- > PCR page 6
- > Post Exposure Prophylaxis (PEP) page 6
- > Handling Blood and Other Body Substances (standard precautions) page 19
- > Avoiding Sexually Transmitted Infections (STI) page 20

### Useful websites

- > AIDS Council of South Australia  
<http://www.acsa.org.au/>
- > Clinic 275  
<http://www.stdservices.on.net/>
- > Australian Federation of AIDS organisations  
<http://www.afao.org.au/>
- > Resources in many languages  
<http://www.multiculturalhivhepc.net.au/>



**HIV and AIDS are notifiable diseases**

# Hydatid Disease

This disease is caused by infection with a small tapeworm parasite *Echinococcus granulosus*.

In Australia, most infections are passed between sheep and dogs, though other animals including goats, horses, kangaroos, dingoes and foxes may be involved.

The hydatid parasite is carried by dogs in their bowel, without any symptoms of infection. Sheep become infected while grazing in areas contaminated with dog faeces. Dogs become infected by eating the uncooked organs of infected sheep.

People become infected by ingesting (eating) eggs of the parasite, usually when there is hand-to-mouth transfer of eggs in dog faeces. This can occur when handling dogs or objects (including food and water) soiled with dog faeces. Person-to-person or sheep-to-person transmission does not occur.

The parasites form slowly enlarging fluid-filled cysts which may become very large. Cysts occur most commonly in the liver or lungs, but may occur in any organ, including the heart, brain and bones. Cysts often do not cause symptoms unless they become very large or break.

Hydatid cysts are diagnosed by X-ray, ultrasound, CT or MRI scans and may sometimes be confirmed by a blood test. Occasionally, microscopic examination of the cyst fluid is required.

## Incubation period

*(time between becoming infected and developing symptoms)*

Variable, from months to years, depending upon the number and location of cysts and how rapidly they grow.

## Infectious period

*(time during which an infected person can infect others)*

There is no direct person-to-person transmission. Dogs begin to pass parasite eggs approximately 7 weeks after infection. Most infections in dogs disappear without treatment within 6 months, but dogs may be infected repeatedly.

## Treatment

Surgical removal of the cysts is the most common treatment, often in combination with specific anti-parasitic drug therapy.

## Control of spread

- > Thorough hand washing after contact with dogs, or objects that may be contaminated with dog faeces (for example, garden soil).
- > Don't let dogs lick your face.
- > Regular worming of pet and working dogs with a treatment that covers hydatid tapeworm (check the label to make sure it contains praziquantel, or ask your vet).
- > Dogs must not be fed raw offal.
- > Exclusion from child care, preschool, school or work is not necessary.



**Hydatid disease is a notifiable disease**

- > [Hand Hygiene page 13](#)

# Influenza: Seasonal, Pandemic and Avian Influenza

## Seasonal Influenza

This is an infection of the nose, throat and lungs caused by the influenza virus. Symptoms include sudden onset of fever, headache, muscle aches, fatigue, running nose, sore throat and cough. Recovery occurs in two to seven days although the cough and fatigue may last longer. Influenza can be a serious illness, potentially fatal, particularly in people over 65 years of age or with a chronic illness.

The diagnosis may be suspected on clinical symptoms and examination (especially during the 'flu season') and is best confirmed by laboratory examination of mucus from the back of the nose or throat.

Influenza is spread when infected airborne droplets, produced by coughing or sneezing by someone with influenza, come into contact with the mucous membrane lining the nose and mouth. Infection may also be spread by contact with hands, tissues and other articles soiled by infected nose and throat discharges.

## Pandemic Influenza

### Pandemic (H1N1) 2009 influenza ("swine flu")

In June 2009 the World Health Organisation declared a global pandemic of a novel influenza A virus, the Pandemic (H1N1) 2009 virus, commonly known as "swine flu" as this virus can also infect pigs. Updated information is available from <http://www.flu.sa.gov.au/>

### Avian Influenza in humans ("bird flu")

Influenza viruses can infect birds, and occasionally human infections may occur through close contact with infected poultry or poultry products. Avian influenza viruses (bird flu) are not naturally transmitted from person to person. However, there have been global pandemics of influenza in the past caused by avian influenza viruses that have changed genetically with the ability to be transmitted from person-to-person.

### Vaccination

The vaccines used for seasonal influenza will not protect against a pandemic virus type. In Australia, there are national and state plans to respond to avian influenza and pandemic influenza which are being regularly updated. For further information see <http://www.health.gov.au/pandemic>

## Incubation period

*(time between becoming infected and developing symptoms)*

1 – 3 days.

## Infectious period

*(time during which an infected person can infect others)*

1 day before the onset of symptoms and 3 – 5 days after the onset of symptoms in adults; up to 21 days in young children.

## Treatment

Specific antiviral therapy is available but is effective only if commenced shortly after the onset of illness (within 48 hours). Antiviral therapy may also be used to prevent infection in close contacts of people with influenza, such as vulnerable household contacts and residents of institutions, especially aged care facilities. This preventive treatment also needs to be given shortly after exposure to an infectious person (within 48 hours).

Paracetamol should be used for the relief of pain and fever.



**Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

## Control of spread

- > A person with suspected or confirmed influenza should be excluded from child care, preschool, school or work until they feel well. People who work in aged care or similar facilities should be excluded from work for five days after the onset of symptoms.
- > **Wash** hands as soon as possible after sneezing or coughing and after contact with nose and throat discharges or articles soiled by these.
- > **Wipe** down all frequently touched surfaces regularly with a cleaning cloth dampened with detergent.

## Control of spread cont.

- > **Cover** a cough or sneeze with a tissue or your arm, not with your hand. Drop used tissues immediately into a rubbish bin, then wash your hands.
- > Influenza vaccines are available and reduce the risk of getting influenza. The influenza virus is constantly changing and each year the influenza vaccines are altered to provide protection against currently circulating strains of the virus, therefore vaccination is required every year.
- > Annual influenza vaccination is recommended for anyone aged six months or older who wishes to reduce the likelihood of becoming ill with influenza.
- > Annual influenza vaccination is strongly recommended and should be actively promoted for the following groups (although the vaccine is only provided free for some of these groups):
  - all individuals aged 65 years or older
  - all Aboriginal and Torres Strait Islander people aged 15 years or older
  - adults and children aged six months or older with chronic disease (especially heart, lung or kidney disease and diabetes) or receiving treatments which suppress the immune system
  - pregnant women and women planning a pregnancy
  - residents of nursing homes and other long-term care facilities
  - homeless people and those providing care to them
  - people who may potentially transmit influenza to those at high risk of complications of influenza, such as staff of nursing homes, health care providers, staff of long-term care facilities and household contacts of persons in high-risk groups

## Control of spread cont.

- people involved in the commercial poultry industry
- people providing essential services
- workers in other industries
- travellers, especially large tourist groups with elderly people and those travelling on cruises in confined circumstances for days or weeks.



**Influenza, avian influenza in humans and pandemic influenza are notifiable diseases**

- > Hand Hygiene page 13
- > Immunisation page 21

## Useful websites

- > **Immunise Australia Program**  
<http://www.immunise.health.gov.au/>
- > **Preparing for Pandemic Influenza**  
<http://www.health.gov.au/pandemic>
- > **Wash, Wipe, Cover**  
<http://www.health.sa.gov.au/INFECTIONCONTROL/>

# Legionella longbeachae Infection

Many different species of bacteria called *Legionella* are commonly found in the environment and some of these are known to cause illness in people. Infection by *Legionella* causes a disease known as legionellosis.

*Legionella longbeachae* generally infects the lung, causing pneumonia, which is a severe illness.

Symptoms of *Legionella* infection include:

- > fever
- > cough
- > chest pain
- > breathlessness
- > diarrhoea.

People of any age may be infected, but the disease is more common in middle aged and older people and people whose immune system is weak. Men are affected more frequently than women. Risk of infection is increased by:

- > smoking
- > chronic heart or lung disease
- > diabetes
- > kidney failure
- > some forms of cancer
- > immunosuppression, especially if on steroid medication
- > being 50 years or older.

Diagnosis is usually made by a series of blood tests. The bacteria may sometimes be grown from a sample of sputum or lung fluid, or detected using other special tests.

*Legionella longbeachae* can be found in potting mixes, compost heaps and composted animal manures. How *Legionella longbeachae* are spread is uncertain, but it is thought that they are breathed in or spread from hand to mouth. The bacteria can remain on hands contaminated by handling potting mix for periods of up to one hour. They can be readily removed from the hands by washing. *Legionella* infection cannot be caught from other people or animals. The risk of *Legionella* infection is not limited to gardeners, but the use of potting mixes, composts and other soils puts them at greater risk.

## Incubation period

(time between becoming infected and developing symptoms)

2 – 10 days, usually 5 – 6 days.

## Infectious period

(time during which an infected person can infect others)

Person-to-person spread does not occur.

## Treatment

Antibiotic treatment may be prescribed by the treating medical practitioner. Some cases may require admission to hospital.

## Control of spread

- > To minimise the risk of exposure when handling garden mixes (bagged or unbagged) such as potting mix, mulches, composts and garden soils, gardeners should take the following precautions:
  - Read the warning on bagged mixes and follow the manufacturer's instructions.
  - Avoid inhaling airborne particles such as dust or mists.
  - Avoid hand-to-mouth contact.
  - Open bagged mixes in a well ventilated space.
  - Moisten the garden mix, avoiding the inhalation of airborne particles.
  - Always wash hands after using garden mixes, even if gloves have been worn.
  - Store bagged mixes in a cool dry place.
- > Additional measures that can be taken to reduce risk include wearing a face mask and gloves.



***Legionella longbeachae* infection is a notifiable disease**

## Useful website

- > SA Health *Legionella* regulations, guidelines and fact sheets  
<http://www.health.sa.gov.au/pehs/environ-health-index.htm>

# Legionella pneumophila Infection

Many different species of bacteria called *Legionella* are commonly found in the environment and some of these are known to cause illness in people. Infection by *Legionella* causes a disease known as legionellosis.

Infection with *Legionella pneumophila* is called Legionnaires' disease. *Legionella* generally infects the lung, causing pneumonia, which is often very severe. Legionnaires' disease occurs most commonly in the warmer months.

Symptoms include:

- > fever
- > cough
- > chest pain
- > breathlessness
- > diarrhoea.

People of any age may be infected, but the disease is more common in middle aged and older people and people whose immune system is weak. Men are affected more frequently than women. Risk of infection is increased by:

- > smoking
- > chronic heart or lung disease
- > diabetes
- > kidney failure
- > some forms of cancer
- > immunosuppression, especially if on steroid medication
- > being 50 years or older.

Diagnosis is usually made by a series of blood tests. The bacteria may sometimes be grown from a sample of sputum or lung fluid. Some infections may be identified rapidly by testing a sample of urine.

*Legionella pneumophila* are widespread in natural water sources and often colonise manufactured water systems. The bacteria must be inhaled to cause disease.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 10 days, though may be longer.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread does not occur.

## Treatment

Antibiotic treatment is required. Severe cases may need to be treated in hospital and may require intensive care.

## Control of spread

- > *Legionella* have been isolated from many sources including ice machines, hot water systems, air-conditioning cooling towers, hot and cold water taps, showers, nebulisers, spa baths and spa pools, hydrotherapy pools and ornamental fountains. Inhalation of aerosols generated by these systems can serve as a route of infection. Ongoing maintenance of these systems significantly reduces the risk of *Legionella* growing and being released into the surrounding environment. These systems must be maintained according to the manufacturer's instructions and any relevant legislation.



***Legionella pneumophila* infection is a notifiable disease**

## Useful website

- > SA Health *Legionella* regulations, guidelines and fact sheets  
<http://www.health.sa.gov.au/pehs/environmental-health-index.htm>

# Leptospirosis (Weil's Disease)

Leptospirosis is an infection caused by corkscrew-shaped bacteria called *Leptospira interrogans*. The bacteria occur worldwide and many different serotypes are known.

People get leptospirosis by contact with fresh water, wet soil or vegetation that has been contaminated by the urine of infected animals, especially rodents (rats, mice), cattle, pigs, horses and dogs. Both domestic and wild animals can carry leptospirosis and they pass the bacteria in their urine.

Leptospirosis is an occupational hazard for many people who work outdoors or with animals, such as dairy farmers, sewer workers, veterinarians, abattoir workers and military personnel. Campers and people who participate in outdoor sports such as white water rafting, swimming or wading in contaminated lakes or rivers are also at risk. The *Leptospira* bacteria can enter the body through broken skin, water-softened skin, mucous membranes or by swallowing or inhaling contaminated water.

Symptoms of infection with *Leptospira* may range from no symptoms to fatal, and illness often occurs in two phases. The first phase of illness begins suddenly with symptoms which may include:

- > high fever
- > vomiting and diarrhoea
- > red eyes
- > muscle aches (especially thigh and calf muscles)
- > rash
- > chills
- > headache.

This stage usually lasts five to seven days, then a second phase of illness (immune phase) may follow one to two weeks later, with symptoms such as:

- > jaundice (yellowing of the skin and eyes)
- > kidney failure
- > irregular heart beat
- > lung problems
- > meningitis (inflammation of the lining of the brain)
- > red eyes.

Diagnosis is difficult, but is usually made by blood and urine tests. Early in the illness the *Leptospira* bacteria may be grown from blood or urine, though they take a long time to grow.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 10 days, with a range of 2 – 26 days.

## Infectious period

*(time during which an infected person can infect others)*

Infections are the result of contact with the urine of infected animals. Person-to-person transmission does not occur.

## Treatment

Effective antibiotic therapy is available. People with serious illness may require hospitalisation for treatment of complications such as kidney failure.

## Control of spread

- > Minimise contact with fresh water, mud and vegetation that might be contaminated with the urine of infected animals, especially rodents. Wear protective clothing, such as waterproof boots or waders, when participating in recreational or work activities that might result in such exposure.
- > Vaccinate dairy cows.
- > Rodent control is important.
- > No vaccine is available for humans.



**Leptospirosis is a notifiable disease**

- > **Serotype page 6**

# Listeriosis

This is a bacterial infection caused by *Listeria monocytogenes*.

These bacteria are widespread in nature, being found in soil, decaying vegetation and the bowels of many mammals. People are probably frequently exposed to *Listeria*, with only mild illness resulting. However, infection is more serious when it occurs in new born babies, the elderly, immune suppressed people and pregnant women.

Symptoms may include:

- > sudden onset of fever
- > headache
- > backache
- > nausea, vomiting
- > neck stiffness
- > gradual onset of confusion, decreased alertness.

Pregnant women may have relatively mild symptoms (fever and aches) and make a quick recovery. However, they may transfer the infection to their unborn child who may be stillborn or born very ill.

The diagnosis is made by growing the bacteria from a sample of cerebrospinal fluid (fluid from around the brain and spinal cord), blood or from samples taken from the baby.

The main way in which *Listeria* infection is spread is by eating contaminated foods. Unlike most bacteria, *Listeria* tends to multiply in refrigerated foods, if they have been contaminated. Foods associated with the spread of *Listeria* include:

- > Cold meats:
  - unpackaged ready-to-eat from delicatessen counters, sandwich bars, etc
  - packaged, sliced ready-to-eat
- > Cold cooked chicken: purchased (whole, portions or diced) ready-to-eat
- > Pâté: refrigerated pâté or meat spreads
- > Salads (fruit and vegetables): pre-prepared or pre-packaged salads e.g. salad bars, smorgasbords etc

- > Chilled seafood:
  - raw seafood (e.g. oysters, sashimi or sushi)
  - smoked ready-to-eat seafood
  - ready-to-eat peeled prawns (cooked)
    - e.g. in prawn cocktails, sandwich fillings and prawn salads
- > Cheese: soft, semi-soft and surface ripened cheeses (pre-packaged and delicatessen)
  - e.g. brie, camembert, ricotta, feta and blue
- > Ice cream: soft serve
- > Other unpasteurised dairy products (e.g. raw goat's milk).

Contact with infected farm animals, particularly stillborn animals, can also spread the infection.

## Incubation period

*(time between becoming infected and developing symptoms)*

Varies from 3 – 70 days. Average 3 weeks.

## Infectious period

*(time during which an infected person can infect others)*

Except for transmission from a pregnant woman to her foetus, person-to-person spread does not occur.

## Treatment

Admission to hospital is usually necessary and antibiotic therapy is given.

## Control of spread

- > Pregnant women and immune suppressed people should take special care to avoid foods which may be contaminated with *Listeria*. They should follow these guidelines:
  - Eat freshly cooked or freshly prepared foods.
  - Eat well washed, freshly prepared fruit and vegetables.
  - Cook foods thoroughly, especially meats.

### Control of spread cont.

- Reheat foods to 'steaming' hot.
  - Make safer food choices. Avoid higher risk foods (as noted above).
  - Avoid ready-to-eat food from salad bars, sandwich bars, delicatessens and smorgasbords.
  - Avoid foods that are past their 'best before' or 'use by' date.
  - Only buy ready-to-eat hot food if it is steaming hot.
  - If eating out, order hot meals.
  - After handling uncooked food, wash hands, knives and cutting boards with detergent and hot water.
  - Avoid the use of untreated manure on vegetable crops which will be eaten raw.
- > Pregnant women and immune suppressed people should avoid contact with sick or stillborn farm animals.



### Listeriosis is a notifiable disease

- > **Preventing Food Poisoning at Home**  
page 15

### Useful website

- > **Food Standards Australia and New Zealand**  
<http://www.foodstandards.gov.au/foodmatters/listeria/index.cfm>

# Malaria

An infection caused by a parasite called *Plasmodium*. There are four species of *Plasmodium* which infect humans – *Plasmodium vivax*, *Plasmodium falciparum*, *Plasmodium malariae* and *Plasmodium ovale*. Of these, *Plasmodium falciparum* infection is the most severe and can cause death in up to 10% of cases. It can be rapidly fatal. Pregnant women and children are especially at risk. Other types of malaria are less severe, but still may cause death.

The parasite is transmitted to humans by the bite of infected female *Anopheles* mosquitoes. The parasites multiply in the liver and the bloodstream and may be taken up by another mosquito when it bites. The mosquito is then infected for the duration of its life and can infect other humans when it bites them.

Occasionally malaria is transmitted by blood transfusion so for this reason people who have travelled to countries where malaria occurs may be deferred from giving blood for a short period.

In humans, the parasites live mostly in the red blood cells, but a very serious complication of *Plasmodium falciparum* malaria is infection of the brain.

Symptoms of malaria include:

- > fever, which may come and go, or may be constant
- > chills
- > profuse sweating
- > malaise (feeling of unwellness)
- > muscle and joint pain
- > headache, confusion
- > nausea, loss of appetite, diarrhoea
- > abdominal pain
- > cough.

Diagnosis is made by a blood test – sometimes it is necessary to repeat the test a number of times, as the parasites can be difficult to detect.

Malaria occurs in most tropical and sub-tropical areas of the world, including Africa, Central and South America, Asia, Southeast Asia, Papua New Guinea and the Western Pacific islands. Over a million people living in these countries die from malaria each year. Many thousands of tourists also get malaria during their travels to countries where malaria is present. Tourists often get severe illness because they have had no previous exposure to malaria and have no resistance to the disease.

## Incubation period

*(time between becoming infected and developing symptoms)*

Varies with the type:

- > *P. falciparum*: 9 – 14 days
- > *P. vivax*: 12 – 18 days but some strains may have an incubation period of 8 – 10 months or longer
- > *P. ovale*: 12 – 18 days
- > *P. malariae*: 18 – 40 days.

These periods are approximate and may be longer if the person has been taking prophylaxis (drugs taken to prevent infection).

## Infectious period

*(time during which an infected person can infect others)*

Direct person-to-person spread does not occur. A person remains infectious as long as the parasites are present in the blood. This may be several years if adequate treatment is not given. Parasites disappear from the blood within a few days of commencing appropriate treatment. Mosquitoes remain infected for life.

## Treatment

Specific antimalarial treatment is available and must always be started immediately malaria is diagnosed. There is increasing resistance to currently available drugs and treatment should be carried out by an infectious diseases physician or other expert in the field.

### Control of spread

- > Extensive international programs are undertaken in malarious countries to try to control this disease. For travellers, the following advice is given:
  - See a travel medicine expert before you go to get specific advice for the places you will be visiting.
  - Always take malaria prophylaxis drugs exactly as prescribed and take the full course. Be aware of their potential side effects.
  - Protect yourself from mosquito bites. Travel medicine centres have good information on how to do this.
  - Be aware that no preventive measures are 100% effective, so always seek medical attention immediately if you develop a fever while travelling in, or after return from, a country where malaria occurs.
  - Always give your doctor the information about your travel if you become sick.
- > There is no vaccine available to prevent malaria.
- > Exclusion from school, child care or work is not necessary.



### Malaria is a notifiable disease

- > Overseas Travel page 26
- > Avoiding Mosquito Bites page 27

# Measles

This is an illness caused by infection with the measles virus. Early in the infection, symptoms may include fever, tiredness, cough, sore throat, runny nose, sore eyes and photophobia (discomfort when looking at light). These symptoms usually worsen over three to five days, then a blotchy rash begins on the head and over the next day or two spreads down the entire body (colour plate no. 11). The rash lasts four to seven days. Measles illness usually lasts about 10 days. The cough may be the last symptom to disappear.

Measles is often a severe disease, frequently followed by middle ear infection (7% of cases) or bacterial pneumonia (lung infection) in 6% of cases. In as many as one in every 1000 cases, brain infection occurs, often resulting in death or permanent brain damage. Sometimes brain damage may not appear until many years later.

Complications from measles are more common and more severe in the chronically ill and in very young children.

The diagnosis is suspected from clinical examination and can be confirmed by a blood test, or detection of the virus in urine, throat or eye specimens.

Measles is spread by breathing infected airborne droplets caused by coughing and sneezing, and by contact with hands, tissues and other articles soiled by nose and throat discharges. The virus is very infectious and droplets in the air may infect people entering a room up to two hours after an infected person has left it.

Until the late 1960s almost everyone caught measles during childhood in Australia. As a result almost all people born in Australia before 1966 are immune to measles. The gradual introduction of measles vaccine since then has resulted in the average age of cases in Australia increasing. Most cases now occur in people aged older than 20 years. Outbreaks in recent years have followed the introduction of the virus from outside Australia.

## Incubation period

*(time between becoming infected and developing symptoms)*

Generally 10 – 14 days.

## Infectious period

*(time during which an infected person can infect others)*

From just before the onset of symptoms (about 3 – 5 days before the rash appears) until 4 days after the rash appears.

## Treatment

There is no specific antiviral treatment for measles. Complications may require antibiotic therapy. Treatment for the symptoms includes plenty of fluids, a darkened room to rest the eyes and paracetamol for the fever.

**! Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

## Control of spread

- > Measles is best prevented by the measles-mumps-rubella (MMR) combination vaccine. Two doses of MMR are recommended: one at 12 months and the second at four years of age.
- > If an unimmunised child (over nine months) or adult has contact with measles, infection may be prevented by immediate vaccination (within 72 hours of first contact) with MMR vaccine. If three to seven days since exposure, immunoglobulin may prevent infection.
- > If an infant less than nine months old has contact with measles, the chance of developing measles can be reduced by giving immunoglobulin within seven days of contact. MMR should then be given as close as possible to 12 months of age, but at least three months after giving immunoglobulin.
- > A person with measles should be excluded from contact with unvaccinated persons for at least four days after the onset of the rash. They should stay home from child care, preschool, school or work.

### Control of spread cont.

- > Unvaccinated children having contact with a person with measles should be excluded for 14 days from the first day of appearance of rash in the last case. If unvaccinated children are vaccinated within 72 hours of their contact with the virus, they may then return to child care, preschool or school. All immunocompromised children having contact with a person with measles should be excluded until 14 days after the first day of the appearance of rash in the last case.
- > Adults born during or since 1966 are very likely to be susceptible to measles. Unless they have had a medically confirmed infection with measles they should ensure that they have had two documented doses of a measles containing vaccine. This is especially important if they are proposing to travel out of Australia.

- > Immunoglobulin page 6
- > Immunisation page 21
- > Overseas Travel page 26

# Meningococcal Infection

The meningococcus (plural meningococci) is a bacterium named *Neisseria meningitidis*. There are 13 different types of meningococcus, but most infections in Australia are caused by types B and C.

Meningococcal disease is a severe infection caused by the meningococcus which may result in meningitis (infection of the outer lining of the brain and spinal cord), septicaemia (infection of the blood), joint infection, eye infection, pneumonia and rash.

Septicaemic meningococcal disease can cause shock and death within hours of the onset of symptoms. In Australia, 5-10% of people with meningococcal disease die, despite rapid treatment.

Meningococcal disease can affect all age groups, but is most common in children under five years of age and in young adults (15 to 24 years). Meningococcal disease can occur throughout the year but is most common in winter and spring. Outbreaks can occur, but are rare.

## Disease transmission

The meningococcus is carried, usually harmlessly, in the nose and throat of around 10% of the population, with higher carriage in some specific groups. The bacteria are passed from person to person by close prolonged contact with fine droplets spread by coughing, sneezing and spluttering. However, only a very small number of people in close contact with carriers develop meningococcal disease, when the bacteria 'invades' the body from the throat or nose.

Contact with saliva from the front of the mouth (e.g. from sharing drinks or cigarettes) has not been shown to cause meningococcal disease.

Even though it is hard to catch and uncommon, meningococcal disease is a feared infection that is often featured in the media.

In infants and young children the symptoms of meningococcal disease include:

- > fever
- > refusing to take feeds
- > fretfulness
- > child difficult to wake
- > high-pitched or moaning cry
- > tiny red or purple spots that soon spread and enlarge to look like fresh bruises (colour plate no. 12)
- > pale or blotchy skin
- > abnormal skin colour
- > leg pain
- > cold hands and feet.

In older children and adults the symptoms of meningococcal disease include:

- > headache
- > fever
- > vomiting
- > neck stiffness
- > photophobia (discomfort when looking at bright lights)
- > drowsiness or confusion
- > tiny red or purple spots that soon spread and enlarge to look like fresh bruises (colour plate no.12)
- > collapse
- > joint pains.

Diagnosis is made in a laboratory from a sample of blood or cerebrospinal fluid (fluid around the brain and spinal cord), by examination, growing meningococcal bacteria or PCR testing.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 3 – 4 days, but can vary from 1 – 10 days.

# Meningococcal Infection (cont.)

## Infectious period

*(time during which an infected person can infect others)*

The person is infectious as long as the meningococcal bacteria are present in the nose and throat, but the bacteria disappear within 24 hours of starting appropriate antibiotic therapy.

## Treatment

A person with suspected meningococcal disease must be treated immediately with an injection of antibiotics and transferred urgently to a hospital.

## Control of spread

- > Very close contacts, such as family members, of a person who has meningococcal disease will be contacted by the public health authority. They may be advised to receive a short course of an appropriate antibiotic to clear any meningococci they may carry in their nose and throat. These antibiotics do not treat the disease, but can help stop meningococci from spreading to other people. It is important to seek urgent medical attention if any symptoms of meningococcal disease develop.
- > All people in the network of contacts of the person with meningococcal disease should receive information about the disease. It is important for them, or anyone close to them, to seek urgent medical attention if they develop any symptoms of meningococcal disease.
- > A person with meningococcal disease must be given an appropriate antibiotic to eliminate meningococci from the nose and throat in order to prevent spread to others.
- > If the meningococcal disease is caused by a type for which there is a vaccine, the public health authority may recommend vaccination of close household contacts.
- > Two types of vaccine are currently available in Australia:
  1. Meningococcal C conjugate vaccine only protects against the meningococcus type C and provides long-lasting protection.

## Control of spread cont.

It is recommended for:

- all children at 12 months of age (free)
  - people who have no spleen, or who have other rare disorders of the immune system.
2. Meningococcal polysaccharide vaccine protects against meningococcus types A, C, W and Y, but only protects for about three years. It is recommended for:
    - international travellers to certain areas where there is a lot of meningococcal disease, including pilgrims attending the annual Hajj
    - people over the age of two years who do not have a spleen, or who have other rare disorders of the immune system.
- > Vaccines may sometimes be used during outbreaks of meningococcal disease.
  - > Because vaccines do not protect against all types of meningococci, vaccinated people must still be alert for symptoms of meningococcal disease.
  - > Cigarette smoking, both active and passive, appears to increase the risk of a person developing meningococcal disease. This is yet another reason to stop smoking and for adults not to smoke near young children.



**Meningococcal infection is a notifiable disease**

- > PCR page 6
- > Immunisation page 21

# Molluscum Contagiosum

This is a common skin infection caused by the molluscipoxvirus.

The virus causes small, usually 2-5mm, painless, pink or pearly white lumps on the skin. The top of the lump is indented and contains a white core. The infection is not serious, only affects the skin, and will disappear without treatment although this may take several months. Individual lumps often disappear after about two months, but often there will be more than one lump and they will not all disappear until six to nine months. There are no long-term ill effects following molluscum contagiosum. People who are immune suppressed may have more lesions and these may take longer to clear up.

Diagnosis is made by clinical examination and confirmed by microscopic examination of the core of the lump.

The virus is transmitted by direct skin-to-skin contact where there are minor breaks in the skin and is most common in children. The virus can also be transmitted sexually when it affects the genital area.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 7 weeks, sometimes longer.

## Infectious period

*(time during which an infected person can infect others)*

As long as the lumps are present. This may be for several months.

## Treatment

Lumps will disappear without treatment, although this may take several months. Various treatments such as laser therapy, freezing and surgery are occasionally used for cosmetic reasons.

## Control of spread

- > Exclusion from child care, preschool, school or work is not necessary.
- > Direct contact with lumps should be avoided.
- > Covering lumps is not necessary.
- > Do not share towels.

# Mumps

This is an illness due to infection with the mumps virus. Mumps occurs most commonly in children and adolescents, though symptoms are more severe in adults. Approximately 30% of cases will have only mild symptoms or no symptoms at all.

When present, symptoms include:

- > swelling of the glands on the sides of the face and along the jaw line. Swelling and tenderness starts just below and in front of one or both ears (colour plate no. 13)
- > fever
- > headache
- > inflammation of the testicles (orchitis) occurs in 20% of adult males
- > inflammation of the ovaries (oophoritis) occurs in about 5% of adult females.

Despite popular opinion, sterility following infection is rare. Another rare complication is inflammation of the brain (encephalitis), though meningitis (inflammation of the lining of the brain and spinal cord) from mumps is probably more common and may be accompanied by hearing loss.

The diagnosis is suspected following clinical examination and can be confirmed by a blood test. Mumps virus may also be grown in the laboratory from throat swabs, fluid specimens taken from the nose, cerebrospinal fluid (fluid surrounding the brain and spinal cord) or urine.

Mumps is spread directly by mucous membrane (lining of the nose and mouth) contact with airborne droplets from the nose and throat. It may be spread indirectly by contact with hands, tissues and other articles soiled by nose and throat discharges. The disease is also spread by direct contact with the saliva of an infected person.

## Incubation period

*(time between becoming infected and developing symptoms)*

Generally 14 – 25 days, usually 18 days.

## Infectious period

*(time during which an infected person can infect others)*

Up to 6 days before swelling of the glands begins and up to 9 days after the onset of swelling. Asymptomatic infections can still result in spread of infection. Exposed non-immune people should be considered infectious from the 12th to the 25th day after exposure whether or not they have symptoms.

## Treatment

Treatment of the symptoms includes giving plenty of fluids. Paracetamol may be given for fever and pain. There is no specific antiviral treatment.

## Control of spread

- > The person should be excluded from school or work for nine days after the onset of symptoms, or until swelling goes down (whichever is sooner).
- > Tissues and other objects soiled with nasal secretions should be disposed of appropriately.
- > Mumps is best prevented by the measles-mumps-rubella (MMR) combination vaccine. Two doses of MMR are recommended: one at 12 months and the second at four years of age. This provides optimal long-term protection.
- > Immunisation after exposure will not prevent infection in contacts, though it will provide immunity in the event of future exposures.



**Mumps is a notifiable disease**

- > [Immunisation page 21](#)

# Murray Valley Encephalitis Virus Infection

Murray Valley Encephalitis (MVE) is a rare disease in humans caused by Murray Valley Encephalitis virus (MVEV). This infection has the capacity to cause acute and severe illness in humans and can be fatal.

MVEV is endemic (always present) in northern Australia (Western Australia and the top end of the Northern Territory) and probably in Papua New Guinea in birds, but illness in humans is rare. Most reported human cases occur in northern Australia and Papua New Guinea although there have been rare cases from South Australia. The last cases in South Australia were in the mid 1970s.

Symptoms of MVEV infection include:

- > fever
- > drowsiness (excessive sleepiness)
- > confusion
- > headache
- > neck stiffness
- > nausea and vomiting
- > tremors
- > fits
- > additionally in infants, irritability and floppiness.

Many people infected with Murray Valley Encephalitis virus have no symptoms or mild symptoms. Mild illness involves symptoms such as fever, headache, nausea and vomiting. In about one in 1000 infected people symptoms worsen, with increasing confusion, headaches, drowsiness and possible fits indicating progression to meningitis (infection of the membranes covering the brain and spinal cord) or encephalitis (infection of the brain).

Diagnosis is made by a blood test or detecting the virus in cerebrospinal fluid (fluid surrounding the brain and spinal cord).

The infection is spread from infected animals to humans by mosquito bites. There is no direct spread from person to person.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 7 – 28 days.

## Infectious period

*(time during which an infected person can infect others)*

There is no evidence of person-to-person transmission.

Infection with MVEV confers life-long immunity.

## Treatment

There is no specific treatment for Murray Valley Encephalitis and no vaccine to prevent infection. People with MVE are usually very sick and require supportive care in hospital until they recover.

About 20% of people who become ill with severe MVE will die. Of those that survive, approximately 40% have permanent neurological damage such as paralysis or brain damage. Others still may take several months to recover.

## Control of spread

- > Exclusion from child care, preschool, school, or work is not necessary.
- > Self protection from mosquito bites is the key to prevention.
- > There is no vaccine to prevent human infection of MVEV by mosquitoes. Personal protection and the environmental management of mosquitoes are therefore essential.

### Personal protection

- > Cover up with long, loose fitting clothing of sufficient thickness to prevent mosquitoes biting through the fabric.
- > Avoid exposure outdoors when mosquitoes are most active.
- > Use an insect repellent containing DEET or Picaridin (the most effective repellents contain 5-20% di-ethyl-N-toluamide or DEET) on exposed skin. Apply in accordance with the manufacturer's instructions. Avoid using on babies and toddlers.

# Murray Valley Encephalitis Virus Infection (cont.)

## Control of spread cont.

- > Use flyscreens and mosquito nets in accommodation where there are no flyscreens, especially for babies. (This is particularly important when camping out, as repellents are only effective for around four hours.)
- > Avoid mosquito-prone areas.

### General mosquito control measures –eliminating mosquito breeding sites

Mosquitoes breed in still water (fresh, salty or stagnant). Stop mosquitoes breeding by cleaning up mosquito breeding sites around the home:

- > Dispose of all containers which hold water, or cover or put holes in them.
- > Empty pot plant drip trays once a week or put sand around pot bases to absorb water.
- > Empty bird baths and pet drinking water at least every three days.
- > Boats, canoes and dinghies should be overturned or have the drain plug removed so they do not hold water after rain.
- > Screen all openings to tanks, wells or other large water containers with wire gauze no coarser than 1mm mesh.
- > Keep roof gutters in good repair and regularly remove leaves and debris so that pools of water do not form.
- > Dispose of all waste water in such a way that no ponding occurs. Keep all open drains and channels free from obstruction, especially weeds, grass and other debris.
- > Keep fish ponds, ornamental ponds, dams and unused swimming pools stocked with fish which will eat mosquito larvae. Goldfish or Australian native fish are recommended.
- > Keep swimming pools disinfected or salted.

- > **Avoiding Mosquito Bites page 27**

## Useful websites

- > **Avoiding Mosquito Bites**  
<http://www.dh.sa.gov.au/pehs/Youve-got-what/avoiding-mosquito-bites-06.pdf>
- > **Fight the Bite**  
<http://www.dh.sa.gov.au/pehs/publications/mozzies-fight-bite.htm>
- > **Murray Valley Encephalitis – Department of Health and Ageing**  
<http://www.health.gov.au/internet/main/Publishing.nsf/Content/health-arbovirus-pdf-fsmurrayvalley.htm>



**Murray Valley Encephalitis (MVE)  
is a notifiable disease**

# *Mycoplasma pneumoniae* Infection

This is infection caused by *Mycoplasma pneumoniae*. *Mycoplasma* are the smallest free-living cells known and are like very small bacteria with no cell walls. *M. pneumoniae* occurs worldwide and is a common cause of mild pneumonia, bronchitis and sore throat. It causes 15-50% of cases of pneumonia in adults and an even higher percentage in school aged children. Infection is most common in people aged between five and 20 years, but can occur at any age.

Symptoms develop over one to three weeks and include:

- > fever
- > dry cough
- > headache
- > chills
- > heavy sweating
- > scratchy sore throat
- > sore trachea (the large airway between the mouth and the lungs)
- > sore chest
- > malaise (feeling of being unwell).

*Mycoplasma pneumoniae* usually resolves without any serious complications, although they may occur. Cough and weakness may persist for more than one month.

Spread is by contaminated droplets produced by coughing or sneezing, or by direct contact with objects soiled by these.

Diagnosis is usually made by blood tests and a chest X-ray.

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 3 weeks.

## Infectious period

*(time during which an infected person can infect others)*

Probably less than 20 days.

## Treatment

Effective antibiotic treatment is available, though most people recover completely without it. Antibiotics may speed recovery, but appear not to reduce the period for which a person is able to transmit infection.

## Control of spread

- > Cover the mouth when coughing or sneezing.
- > Use tissues when coughing, sneezing or wiping the nose, and dispose of these appropriately.
- > Follow good hand washing procedures.
- > Exclusion from child care, school or work is not necessary.
- > No vaccine is available at the present time.

> [Hand Hygiene page 13](#)

# Norovirus Infection

Noroviruses are members of a group of viruses called caliciviruses, also known previously as 'Norwalk-like viruses' or small round structured viruses. Norovirus infection is also called viral gastroenteritis.

Norovirus infection causes gastroenteritis, which is an inflammation of the stomach and the small and large intestines. Noroviruses are a very common cause of gastroenteritis outbreaks in South Australia.

Common symptoms include:

- > nausea
- > vomiting
- > diarrhoea
- > abdominal cramps.

Other symptoms may include:

- > headache
- > low grade fever
- > chills
- > muscle aches
- > general sense of tiredness.

Illness often begins suddenly and symptoms usually last one or two days. However, during that brief period people can feel very ill and vomit, often violently and without warning, many times a day.

Noroviruses are very contagious and can spread easily from person to person. Both stool and vomit are infectious. People can become infected with the virus in several ways, including:

- > eating food or drinking liquids that are contaminated with norovirus by food handlers who have not washed their hands adequately or from environmental contamination
- > touching surfaces or objects contaminated with norovirus and then placing their hands in their mouth, or eating before washing their hands
- > having direct contact with another person who is infected (for example, when caring for someone with illness, or sharing foods or eating utensils with someone who is ill).

Diagnosis can be made by PCR testing of a faecal specimen, but is usually only done for investigation of outbreaks.

## Incubation period

*(time between becoming infected and developing symptoms)*

Symptoms usually begin 24 to 48 hours after ingestion of the virus, but can appear as early as 12 hours after exposure.

## Infectious period

*(time during which an infected person can infect others)*

Norovirus can be found in the stool and vomit of infected persons from the day they start to feel ill to as long as 2 weeks after they recover.

## Treatment

No specific therapy exists for norovirus infection and there is no vaccine available.

The following are general recommendations for the treatment of gastroenteritis:

- > Give plenty of fluids. Oral rehydration solution is highly recommended for children with mild to moderate dehydration. It is available at pharmacies and should be administered following the instructions on the packaging.
- > Mildly unwell children should be given their usual fluids more often. Carbonated (fizzy) drinks or undiluted juice should be avoided.
- > Medicines to prevent vomiting or diarrhoea should not be given (especially in children), except where specifically advised by a doctor.
- > Breastfed babies should continue to be breastfed throughout their illness.
- > Children on formula or solid diets should restart their normal diet (including full strength lactose containing milk) following rehydration with oral rehydration solution.
- > Children who are hungry or ask for food should be given small portions of their usual foods, but avoid foods high in sugar or fat.

### Control of spread

- > Exclude from child care, preschool, school and work until there has been no diarrhoea or vomiting for 24 hours. If working in a child care, health care or commercial food setting, the exclusion period should be 48 hours.
- > Wash hands after using the bathroom and changing nappies.
- > Wash hands before eating, or preparing food for yourself or others.
- > Good food handling procedures should always be followed.
- > Persons working in day care centres or nursing homes should pay special attention to children or residents who have norovirus illness – this virus is very contagious and can spread rapidly throughout such environments.
- > Immediately remove and wash clothing or bedding that may be contaminated with virus after an episode of vomiting and diarrhoea (use hot water and soap).
- > After an episode of vomiting and diarrhoea, thoroughly clean contaminated surfaces with detergent and water and then disinfect contaminated surfaces immediately by using a household bleach diluted according to the manufacturer's instructions.
- > Flush or discard any vomitus and/or stool in the toilet and make sure that the surrounding area is kept clean.

- > PCR page 6
- > Hand Hygiene page 13
- > Keeping Areas Clean page 14
- > Preventing Food Poisoning at Home page 15
- > Collecting a Faecal Sample page 155

# Non-Specific Urethritis (NSU)

Urethritis, infection of the urethra (the urinary canal leading from the bladder to the outside of the body), which is not caused by gonorrhoea or *Chlamydia* infection is called non-specific urethritis. Gonorrhoea and *Chlamydia* infection are by far the commonest cause of urethritis, but a number of other organisms can cause this condition. It is most commonly diagnosed in men.

In men, symptoms may include a watery discharge from the penis and a burning sensation in the penis when urinating. In women, pain occurs when urinating and discharge may not be noticed. These symptoms occur to varying degrees.

The diagnosis is usually made when symptoms are present but tests for gonorrhoea and *Chlamydia* are negative. There are no tests for most of the other organisms which can cause this condition and it is likely there are some causes which have not yet been identified. Some of the likely causes are bacteria such as *Ureaplasma urealyticum* and *Mycoplasma genitalium*, parasites such as *Trichomonas vaginalis* and viruses such as herpes simplex virus.

Most infections are sexually transmitted.

## Incubation period

*(time between becoming infected and developing symptoms)*

Variable, usually between 2 – 35 days.

## Infectious period

*(time during which an infected person can infect others)*

Until antibiotic therapy has been completed.

## Treatment

Effective antibiotic treatment is available on prescription by a doctor. Continued or recurring symptoms may require referral for specialist treatment.

## Control of spread

- > No unprotected sex until treatment completed.
- > Practise safer sex – use condoms.
- > Treat sexual partners (who may be without symptoms).
- > Testing to exclude other sexually transmitted infections is advisable.

- > **Avoiding Sexually Transmitted Infections (STI) page 20**

## Useful website

- > **Clinic 275**  
<http://www.stdservices.on.net/std>

# Parvovirus B19 Infection (Fifth Disease, Slapped Cheek, Slapped Face, Erythema Infectiosum)

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.)

About 20% of infected children will have no symptoms at all. In others, early in the infection there may be mild cold-like symptoms, then two to five days later, the child typically develops a 'slapped cheek' rash on the face and a lacy red rash on the trunk and limbs (colour plate no. 14). The child usually is not very ill, though the rash may occasionally be itchy. The rash disappears after seven to 10 days, although it may come and go for several weeks, often in response to heat. On recovery, the child develops lasting immunity and is protected against future infection.

Adults may also be infected with parvovirus B19 and may have no symptoms, or may have the typical rash of fifth disease, joint pain or swelling, or both. The joints most frequently affected are the hands, wrists and knees, usually on both sides of the body and usually getting better in a week or two, though sometimes the pain and swelling may last several months. At least 50% of adults have previously been infected with parvovirus B19 and have developed immunity, so they will not get the infection again.

Infection by parvovirus B19 generally causes only a mild illness. However, if a pregnant woman is infected, the infection may be transmitted to the foetus. 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 mental retardation. Still, a pregnant woman who has been exposed to parvovirus B19 should seek the advice of the doctor managing her pregnancy, although there is no universally recommended approach to monitoring of a woman in this situation.

Infection in people with a weakened immune system, or some blood disorders, can result in prolonged infection and severe anaemia.

Parvovirus B19 infection is diagnosed by a blood test. The blood test can also be used to test for immunity, to see if the person has had the infection in the past.

Spread of infection is by direct or indirect connection with airborne droplets from coughing or sneezing. Once the rash appears, the person is no longer infectious. An exception to this is in infected people with immune suppression, who may remain infectious for months. Infection may also be transmitted from a woman to her foetus.

## Incubation period

*(time between becoming infected and developing symptoms)*

4 – 14 days from exposure, though may be up to 20 days.

## Infectious period

*(time during which an infected person can infect others)*

In most cases, not infectious once the rash appears. Immunocompromised people with parvovirus infection may be infectious for long periods.

## Control of spread

- > There is no vaccine or antiviral drug for prevention or treatment of parvovirus infection.
- > Do not exclude people with parvovirus infection from child care, preschool, school or work. People are contagious before they develop the rash.
- > Wash hands regularly.
- > Clean surfaces contaminated by discharges from the nose or throat.

### Control of spread cont.

- > Pregnant women who are concerned that they are at risk of exposure to parvovirus B19 infection (for example, school teachers) can have a blood test to detect evidence of previous infection and therefore immunity. Over 50% of women will already have had the infection and these women and their unborn babies are protected from infection and illness. It is not recommended that non-immune pregnant women should routinely be excluded from a workplace where there are known cases of parvovirus infection. A woman in this situation should make a decision about continuing at work after discussion of options with her family, doctor and employer.

# Pneumococcal Infection

Pneumococcal infections are caused by the bacterium *Streptococcus pneumoniae*, also known as pneumococcus (plural 'pneumococci'). Pneumococci are commonly found in the upper respiratory tract of healthy people throughout the world. Infections usually involve the lungs, middle ear, sinuses, bloodstream, or the meninges, which are the lining of the brain and spinal cord (causing meningitis). There are many different types (serotypes) of pneumococci.

Although anyone can get pneumococcal disease, it tends to occur in the elderly or in people with serious underlying medical conditions. Children under two, children in group child care, and Aborigines and Torres Strait Islanders are also at higher risk.

Pneumococcal pneumonia is a serious infection of the lungs which can be fatal, especially in the elderly or infants.

Symptoms of pneumococcal pneumonia include:

- > fever
- > chills and shaking
- > chest pain when breathing in or out
- > shortness of breath
- > cough
- > blood-stained or 'rusty' sputum
- > drowsiness or confusion are common symptoms in the elderly.

People with pneumococcal meningitis often have:

- > high fever
- > headache
- > stiff neck
- > nausea and vomiting
- > discomfort when looking at bright light.

The classic symptoms may be difficult to detect in infants and the child may only appear to be inactive, irritable, feeding poorly and may be vomiting.

Pneumococcal infection is diagnosed by microscopic examination and growth of the bacteria from blood, sputum or other specimens. PCR is sometimes used.

Infection is spread by airborne droplets from the nose and throat, or by direct contact with mucous membranes. It may be spread indirectly by contact with hands, tissues and other articles soiled by nose and throat discharges. Pneumococcal infections are more common during the winter and may be triggered by viral infections.

## Incubation period

*(time between becoming infected and developing symptoms)*

This is uncertain, but may be as short as 1 – 3 days.

## Infectious period

*(time during which an infected person can infect others)*

Effective antibiotic therapy makes people non-infectious within 24 to 48 hours. There is no need to give antibiotics to contacts who are not ill. Pneumococci are commonly found in the upper respiratory tract of healthy people throughout the world. Outbreaks of pneumococcal pneumonia are rare. When an outbreak does occur, it is usually in adults living in crowded, substandard conditions.

## Treatment

Effective antibiotic therapy is available, although there has been development of increasing resistance to commonly used antibiotics.

### Control of spread

- > Exclusion from work or school is not necessary. The person can return when they feel well. It is not necessary to give antibiotics to contacts in school or child care centres if they are not sick.
- > Vaccines against *Streptococcus pneumoniae* are available. They act against the commonest serotypes causing infection. So far it has not been possible to create a vaccine effective against all of the known serotypes, so vaccination can not be guaranteed to give complete protection.
- > There are two types of vaccine currently available:
  - the pneumococcal conjugated vaccine, which protects against seven serotypes of pneumococci (7vPCV) and is recommended for children at two, four and six months of age
  - the pneumococcal polysaccharide vaccine which protects against 23 serotypes (23vPPV) and is recommended for indigenous persons and medically at risk children and adults.
- > Free pneumococcal vaccine is available and recommended for the following groups:
  - all babies at two, four and six months (7vPCV)
  - all children at 12 months (7vPCV) and four to five years (23vPPV) with medical conditions that put them at risk
  - indigenous people aged 15-49 years who have medical conditions putting them at risk (23vPPV)
  - indigenous people aged 50 years and over (23vPPV)
  - all adults aged 65 years and over (23vPPV).
- > Pneumococcal vaccination is also recommended for individuals:
  - who do not have a spleen
  - who are tobacco smokers

### Control of spread cont.

- whose immune system is compromised
- with chronic illnesses such as heart, kidney or lung disease, diabetes, alcoholism and some blood disorders.

People in these categories should consult their doctor about vaccination.



**Invasive pneumococcal infection is a notifiable disease**

- > PCR page 6
- > Serotype page 6
- > Immunisation page 21

### Useful website

- > **The Australian Immunisation Handbook**  
<http://www.immunise.health.gov.au/>

# Psittacosis (Ornithosis)

An infection of the lung caused by the bacterium *Chlamydophila (Chlamydia) psittaci*. The bacteria causing the disease are carried by wild and domesticated birds and it is likely that all birds are susceptible.

Even apparently healthy birds can shed *Chlamydophila psittaci*. People become infected when they inhale the bacteria from dried nose and eye secretions, droppings or dust from feathers of infected birds. Infection is a hazard in pet shop employees, pet owners, poultry farm and abattoir workers, and veterinarians. Infection has been transmitted to gardeners spreading chicken manure on gardens. However, about one-quarter of people who get psittacosis have no history of obvious exposure to birds.

Symptoms are very varied, but commonly include:

- > fever
- > cough, usually without much sputum
- > headache
- > rash
- > muscle aches
- > chest pain
- > shortness of breath
- > sore throat
- > swollen lymph glands.

Illness ranges from mild through to severe and is sometimes fatal.

The diagnosis is suspected following a clinical examination, especially if the patient has a history of exposure to birds. The diagnosis is confirmed by a series of blood tests and a chest X-ray.

## Incubation period

*(time between becoming infected and developing symptoms)*

From 1 – 4 weeks.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread is unlikely to occur. Apparently healthy as well as diseased birds may shed the bacteria for months. Re-infection of people and birds may occur.

## Treatment

Specific and effective antibiotic therapy is available.

### Control of spread

- > Sick birds should be treated promptly by a veterinarian.
- > Close contact with birds, especially kissing, should be discouraged.
- > Clean bird cages regularly, including water and food trays, using gloves and a wet cleaning method to minimise inhalation of bird droppings.
- > Exclude birds from roof spaces prior to blocking access to the birds.
- > Tissues used by patients should be disposed of carefully.
- > Exclusion from school or work is not necessary.



**Psittacosis (Ornithosis) is a notifiable disease**

# Pubic Lice (Crabs)

This is infestation of the pubic hair by the pubic or crab louse, *Phthirus pubis*. In heavy infestations they may be found on other hairy parts of the body, especially the armpits and eyebrows. They are not the same as head lice.

The main symptom is itching in the genital area.

The lice can be seen with the unaided eye or more clearly with a magnifying glass. The greyish-white adults are about 2mm long and almost as broad, with thick legs, and resemble a crab in appearance. They lay their eggs on pubic hairs and spend their entire life on the human host, feeding by sucking blood. They cannot survive without a human host.

Transmission is mostly during sexual contact, but they can be spread on bedding, clothing or by close non-sexual body contact.

## Incubation period

*(time between becoming infested and developing symptoms)*

The eggs usually hatch in 7 days and adult lice live for about 30 days. It may take up to 1 month for symptoms to develop, as the person develops an allergic reaction to the saliva injected by the louse when biting.

## Infectious period

*(time during which an infested person can spread the lice to others)*

While there are living adult lice on an infested person the lice can be passed on.

## Treatment

Insecticidal creams and lotions may be obtained from pharmacies. They should be used strictly according to directions and treatment repeated after a week to kill any lice which may have hatched since the first treatment. They should not be used around the eyes. This area may be treated with petroleum jelly twice a day for eight days. Consult your doctor for treatment of severe itching or if the bites become infected.

## Control of spread

- > Sexual partners should be treated at the same time as the case.
- > Wash bedding, all clothing including night clothes and bath towels used while infestation was present in hot, soapy water, or dry clean.
- > Testing to exclude other sexually transmitted infections is advisable. Up to one-third of people infested with pubic lice will have another sexually transmitted infection.

- > **Avoiding Sexually Transmitted Infections (STI) page 20**

## Useful website

- > **Clinic 275**  
<http://www.stdservices.on.net/std>

# Q Fever

Q fever is an infection caused by *Coxiella burnetii*, a type of bacterium 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. Infection in animals is probably common, but they usually do not appear to be ill.

The bacteria pass into milk, urine and faeces of infected animals and during birthing, large numbers of organisms are shed in the birth products. Q fever organisms are resistant to heat, drying and many common disinfectants, allowing them to survive for long periods in the environment.

Infection of humans usually occurs by inhalation of the bacteria in air carrying dust contaminated by dried placental material, birth fluids, urine or faeces of infected herd animals. Contaminated clothing, wool, hides or straw may also be a source of infection. Person-to-person spread is extremely unlikely. Usually, Q fever is an occupational disease of meat workers, farmers and veterinarians. People living within one kilometre downwind of an abattoir are also at increased risk of infection.

Diagnosis is made by a series of blood tests.

Only about half of all people infected with *Coxiella burnetii* show signs of clinical illness, but onset of symptoms is usually sudden, with one or more of the following:

- > fever, which may last for up to four weeks
- > severe headache
- > sweats and chills
- > fatigue – and a chronic fatigue syndrome may follow infection
- > muscle aches
- > confusion
- > sore throat, dry cough, chest pain on breathing
- > nausea, vomiting, diarrhoea, abdominal pain.

Up to half of symptomatic cases will develop pneumonia (lung inflammation) and many people will have inflammation of the liver. However, most people will recover within several months without any treatment and only 1-2% of people with acute Q fever die of the disease.

Some people may develop chronic Q fever after exposure. Infection persists for more than six months and may not be apparent until many years after the initial infection. It is rare, but can have serious complications such as endocarditis, infection of the heart valves.

People at most risk of developing chronic Q fever include:

- > those with underlying heart abnormalities
- > transplant recipients
- > cancer patients
- > those with chronic kidney disease.

## Incubation period

*(time between becoming infected and developing symptoms)*

Usually 2 – 4 weeks.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread occurs rarely.

## Treatment

Effective antibiotic therapy is available. With early diagnosis, treatment is simple and a good outcome can be expected.

### Control of spread

- > A Q fever vaccine has been developed in Australia 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.
- > Vaccination will not prevent disease in someone who has been infected and is in the incubation period of the disease.
- > Vaccination is recommended for:
  - abattoir workers (but not pig or poultry abattoirs)
  - farmers, stockyard workers and animal transporters
  - shearers and wool sorters
  - others exposed to cattle, camels, sheep, goats and kangaroos or their products
  - veterinarians, veterinary nurses and students
  - agricultural college staff and students (working with high risk animals) and laboratory personnel handling veterinary products or working with the organism.
- > Don't drink unpasteurised milk.
- > Exclusion from school or work is not necessary.



**Q fever is a notifiable disease**

# Rabies and Australian Bat Lyssavirus

Lyssaviruses are a group of viruses that include Australian bat lyssavirus and rabies virus.

Rabies is an infection of mammals that occurs in many parts of the world, but not in Australia. Infection with rabies can sicken and kill the affected mammal and when people are infected, usually through a bite or scratch from an infected animal, they almost always die.

Australian bat lyssavirus is a virus that is related to but different from rabies. The virus is carried by bats and as far as is known, has not spread to other native or domesticated animals. It rarely infects humans. Only two cases of human infection with Australian bat lyssavirus have been recorded in Australia, both in Queensland in the mid-1990s. Both people died.

Rabies and Australian bat lyssavirus infection are thought to cause similar symptoms.

These include:

- > headache
- > fever
- > malaise
- > sensory changes around the site of the bite or scratch
- > excitability
- > an aversion to fresh air and water
- > weakness
- > delirium, convulsions and coma.

Death usually follows several days after the onset of symptoms.

Both rabies and bat lyssavirus are spread from infected mammals to people or other mammals through bites or scratches. Biting or scratching can inject the viruses – which are contained in the animal's saliva – into the exposed person's body. An infected animal may not show any symptoms of illness.

Overseas, mammals that transmit rabies include bats, dogs, cats, raccoons, skunks, monkeys and other mammals that can bite and scratch. Rabies kills many local people overseas and has infected some Australians travelling or living overseas. Rabies is a risk to travellers in the United States, Canada, South and Central America, much of Europe, Asia, Africa and the Middle East, as well as many other places.

In Australia, people who handle bats are at risk of Australian bat lyssavirus infection. In Australia, only bats – both the larger flying foxes (or fruit bats) and the smaller insectivorous (or micro) bats – have been found to carry bat lyssavirus. Scientists believe the virus is present in bat populations throughout the entire range of flying foxes in Australia. Other Australian mammals have not been shown to carry rabies or Australian bat lyssavirus.

Diagnosis can be difficult and confirmation requires laboratory tests for the presence of the virus in skin, blood, spinal fluid and nervous tissue or other tissue. *There is no cure once the disease begins.*

## Incubation period

*(time between becoming infected and developing symptoms)*

For rabies, usually 3 – 8 weeks, but periods from 9 days to 7 years have been documented. There is little information available on Australian bat lyssavirus.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread is rare, but is possible while the person with rabies remains alive. Animals infected with rabies may be infectious for several weeks before symptoms appear until after they have died. This period varies depending on the species.

## Treatment

If given soon enough after exposure, rabies immunoglobulin and vaccine may prevent development of infection. However, once symptoms develop, these infections are almost invariably fatal.

### Control of spread

- > Unless it is part of your job and you have been trained in and use the proper protective equipment, do not attempt to handle wild mammals. Australian bat lyssavirus and rabies are only two of the many infections that animals can transmit to people.
- > Rabies vaccine helps prevent both rabies and Australian bat lyssavirus infection. People who handle or come into contact with bats in Australia – for example, bat carers, wildlife officers and veterinarians – should receive a course of vaccine from their local doctor. People who are travelling to countries overseas where rabies occurs should discuss the need for vaccination prior to travel with a travel medicine expert. There will be a charge for the vaccine.
- > Even if you have not been vaccinated beforehand, a post-exposure course of rabies vaccine, along with another injection called rabies immunoglobulin, can prevent infection if given soon after the bite or scratch.
- > If you are bitten or scratched by a bat in Australia, or by a wild mammal (or any unvaccinated animal) overseas:
  - thoroughly wash the wound immediately with soap and water. Proper cleansing of the wound is regarded as the single most effective measure for reducing transmission
  - apply an antiseptic solution such as povidone-iodine
  - seek immediate medical attention.



**Rabies and Australian Bat Lyssavirus Infections are notifiable diseases**

- > Immunoglobulin page 6
- > Overseas Travel page 26
- > Immunisation page 21
- > Animal Bites and Scratches page 31

# Respiratory Syncytial Virus (RSV) Infection

Respiratory Syncytial Virus (RSV) is the most common cause of bronchiolitis and pneumonia among infants under one year of age. Bronchiolitis is inflammation of small air passages in the lungs and pneumonia is inflammation of the lung tissue itself. Almost all children will get RSV infection at least once by two years of age. RSV may cause respiratory disease at any age and infections may be severe among the elderly and people of any age with heart, lung or immune system problems. Infections may recur throughout life. In South Australia, infections are most common during winter and early spring.

The first symptoms are usually fever, runny nose, cough and sometimes wheezing. Ear infections are common. Pneumonia and bronchiolitis often follow, especially in infants. Most children recover from the illness in eight to 15 days, but some require hospitalisation, mostly in the very young age group below six months.

Diagnosis can be made by direct detection or isolation of the virus from respiratory secretions, or by blood tests.

RSV is spread from respiratory secretions, through close contact with infected persons or contact with contaminated surfaces. Infection occurs when material containing RSV contacts the eyes, mouth or nose. The virus survives only for a few hours outside of the body and is easily killed by soap and water or disinfectants.

## Incubation period

*(time between becoming infected and developing symptoms)*

The average incubation period is 5 days, with a range of 2 – 8 days.

## Infectious period

*(time during which an infected person can infect others)*

Uncertain, but probably from before symptoms develop until recovery from the infection. Most people recover from the infection within about 10 days.

## Treatment

There is usually no need for treatment other than paracetamol for fever and maintaining adequate fluid intake. Very ill children and elderly people may require admission to hospital (less than 3% of children with RSV require this) and treatment tends to be supportive. Because RSV is a virus, antibiotics do not help. There are no safe and effective antiviral drugs for routine use for RSV.

## Control of spread

- > Children with symptoms of respiratory infections should not attend school or child care until they are well.
- > There is currently no vaccine available.
- > Frequent hand washing is the most effective means of preventing spread, as the virus is easily killed by soap and water.
- > Avoid sharing cups, glasses and eating utensils with people who have respiratory infections.

- > [Hand Hygiene page 13](#)

# Roseola (Exanthem Subitum, Sixth Disease)

This is an illness caused by infection with a virus called human herpes virus-6 (HHV-6). Almost all children have been infected with HHV-6 by the age of two years.

Symptoms include the sudden onset of a high fever that lasts three to five days and then falls, at which time a rash appears. The rash looks similar to the measles rash, but appears first on the body rather than the face. Roseola is usually a mild illness, although it can lead to convulsions (caused by the high fever).

Diagnosis is made by clinical examination.

Roseola is spread by airborne droplets from the nose and throat and indirectly by contact with hands, tissues and other articles soiled by nose and throat discharges. The disease is also spread by direct contact with the saliva of an infected person.

## Incubation period

*(time between becoming infected and developing symptoms)*

About 10 days.

## Infectious period

*(time during which an infected person can infect others)*

Saliva, nasal and throat secretions are most infectious from a few days before until several days after the rash appears.

## Treatment

No specific antiviral therapy is required. Fever may be treated with paracetamol.

## Control of spread

- > Exclusion from child care, preschool, school or work is not necessary.
- > Follow good hand washing procedures.
- > Dispose of soiled tissues appropriately.
- > There is no vaccine available to prevent this infection.

> [Hand Hygiene page 13](#)



**Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

# Ross River Virus

This is an illness caused by infection with the Ross River virus, which is related to Barmah Forest virus. It may also be known as Ross River fever.

Many people infected with Ross River virus, particularly children, have no symptoms and the severity of symptoms increases with age.

Symptoms vary from person to person and may include:

- > fever
- > chills
- > muscle aches
- > rash
- > fatigue
- > aching tendons
- > swollen lymph nodes.
- > headache, especially behind the eyes
- > joint pain, swelling and stiffness.

The most distinctive and distressing feature of Ross River virus infection is usually joint pain. Any joint in the body may be affected, but the most common sites are the wrists, knees, ankles, fingers, elbows, shoulders and jaw. The pain may be more severe in different joints at different times. In most cases, symptoms disappear within six weeks, though some people may still have symptoms after a year or two and the symptoms may come and go. About 10% of people have ongoing depression and fatigue.

Diagnosis is made by a blood test. Other illnesses with similar symptoms may need to be excluded.

The infection is spread by mosquitoes from infected animals to humans. Native animals such as wallabies and kangaroos are thought to be the main animals involved in the cycle of infection. When a female mosquito feeds on the blood of an infected animal, the mosquito may become infected with the virus. The virus may then be passed on to humans or other animals when the mosquito feeds again. In large outbreaks mosquitoes may also spread the virus from infected people to other people.

## Incubation period

*(time between becoming infected and developing symptoms)*

3 days to 3 weeks, usually 1 – 2 weeks.

## Infectious period

*(time during which an infected person can infect others)*

Direct person-to-person spread does not occur.

## Treatment

There is no specific antiviral treatment for Ross River virus and no vaccine to prevent infection. Paracetamol may be used to treat pain and fever.

The Arthritis Foundation of South Australia provides a very helpful fact sheet on dealing with the symptoms. This can be obtained by phoning its telephone information service on 1800 011 041.

## Control of spread

- > Exclusion from child care, preschool, school or work is not necessary.
- > Self protection from mosquito bites is the key to prevention.

### Personal protection

- > Cover up with long, loose fitting clothing of sufficient thickness to prevent mosquitoes biting through the fabric.
- > Avoid exposure outdoors when mosquitoes are most active.
- > Use an insect repellent containing DEET or Picaridin (the most effective repellents contain 5-20% di-ethyl-N-toluamide or DEET) on exposed skin. Apply in accordance with the manufacturer's instructions. Avoid using on babies and toddlers.
- > Use flyscreens and mosquito nets in accommodation where there are no flyscreens, especially for babies. (This is particularly important when camping out, as repellents are only effective for around four hours.)
- > Avoid mosquito-prone areas.

### Control of spread cont.

#### General mosquito control measures – eliminating mosquito breeding sites

Mosquitoes breed in still water (fresh, salty or stagnant). Stop mosquitoes breeding by cleaning up mosquito breeding sites around the home:

- > Dispose of all containers which hold water, or cover or put holes in them.
- > Empty pot plant drip trays once a week or put sand around pot bases to absorb water.
- > Empty bird baths and pet drinking water at least every three days.
- > Boats, canoes and dinghies should be overturned or have the drain plug removed so that they do not hold water after rain.
- > Screen all openings to tanks, wells or other large water containers with wire gauze no coarser than 1mm mesh.
- > Keep roof gutters in good repair and regularly remove leaves and debris so that pools of water do not form.
- > Dispose of all waste water in such a way that no ponding occurs. Keep all open drains and channels free from obstruction, especially weeds, grass and other debris.
- > Keep fish ponds, ornamental ponds, dams and unused swimming pools stocked with fish which will eat mosquito larvae. Goldfish or Australian native fish are recommended.
- > Keep swimming pools disinfected or salted.



**Ross River virus infection is a notifiable disease**

- > **Avoiding Mosquito Bites** page 27

#### Useful website

- > **Fight the Bite**  
<http://www.health.sa.gov.au/PEHS/publications/mozzies-fight-bite.htm>

# Rotavirus Infection

This is an infection of the bowel caused by a virus (rotavirus). There are several different types of rotavirus. Rotavirus infection is the most common cause of severe diarrhoea in infants and children worldwide.

Symptoms include:

- > vomiting
- > fever
- > watery diarrhoea.

The onset is sudden and symptoms last for an average of three to seven days. The illness may cause severe dehydration and require treatment in hospital. Mainly infants up to three years of age are affected, but older children and adults may also have symptomatic infection. Children can be infected with rotavirus several times during their lives. Children and adults with impaired immunity are at increased risk of more severe infection. In temperate areas of Australia, rotavirus infections are more common in mid to late winter, while in the northern tropical and arid regions there is no seasonal pattern. Epidemics of rotavirus can occur.

The infection is diagnosed by testing a faecal specimen.

Rotavirus infection is spread through contamination of hands, objects, food or water with infected faeces. The virus is taken in by the mouth. Such routes of infection are common in day care centres, family homes and homes for the elderly. It may also be spread by mucous membrane (lining of nose and mouth) contact with infected airborne droplets produced by coughing and sneezing.

## Incubation period

*(time between becoming infected and developing symptoms)*

About 24 – 72 hours (1 – 3 days).

## Infectious period

*(time during which an infected person can infect others)*

Children can spread rotavirus 2 days before and up to 8 days after they become unwell with diarrhoea. Rotavirus is not usually detectable in the faeces after the 8th day of illness.

## Treatment

Gastroenteritis (inflammation of the stomach and intestines) is a common illness which can be particularly serious in young children. No specific antiviral treatment is available and antibiotics are not effective. Drugs to decrease diarrhoea should not be given.

Seek medical advice if any of the following symptoms occur:

- > signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, sunken eyes, feeling faint on standing
- > fever
- > abdominal pain, especially if severe
- > bloody diarrhoea
- > any symptoms in a child less than 12 months of age.

The following are general recommendations for the treatment of gastroenteritis:

- > Give plenty of fluids. Oral rehydration solution (ORS) is highly recommended for children with mild to moderate dehydration. It is available at pharmacies and should be administered following the instructions on the packaging.
- > Mildly unwell children should be given their usual fluids more often. Carbonated (fizzy) drinks or undiluted juice should be avoided.
- > Medicines to prevent vomiting or diarrhoea should not be given (especially in children), except where specifically advised by a doctor.
- > Breastfed babies should continue to be breastfed throughout their illness.
- > Children on formula or solid diets should restart their normal diet (including full strength lactose containing milk) following rehydration with oral rehydration solution.
- > Children who are hungry or ask for food should be given small portions of their usual foods, but avoid foods high in sugar or fat.

### Control of spread

- > Exclude from child care, preschool, school or work until there has been no diarrhoea or vomiting for at least 24 hours.
- > Follow good hand washing and keeping areas clean procedures including objects (toys) that may be shared.
- > Two oral (by mouth) rotavirus vaccines are now available in Australia. Free childhood immunisation with rotavirus vaccine started in July 2007 in South Australia. The vaccine provides good protection against the most common rotavirus serotypes. It is important for immunisation providers and parents to note there are upper age limits for the administration of the first and final doses of rotavirus vaccines.

The two oral vaccines are:

1. Rota Teq®, three doses recommended for children at two, four and six months of age.
2. Rotarix®, two doses recommended for children at two and four months of age.



**Rotavirus infection is a notifiable disease**

- > Serotype page 6
- > Hand Hygiene page 13
- > Keeping Areas Clean page 14
- > Immunisation page 21
- > Collecting a Faecal Sample page 155

### Useful websites

- > Immunisation Fact Sheet – Rotavirus  
<http://www.dh.sa.gov.au/pehs/Immunisation/imm-fs-rotavirus.pdf>
- > Child and Youth Health Parenting and Child Health – Health Topic – Rotavirus gastroenteritis  
<http://www.cyh.com.au/HealthTopics/HealthTopicDetails.aspx?p=114&np=303&id=1437>

# Rubella (German Measles)

This is an infection caused by the rubella virus.

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 (for example, 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.

In other people, rubella is a mild disease.

Symptoms when present include:

- > fever
- > headache
- > runny nose
- > conjunctivitis (inflammation of the eyes)
- > rash (colour plate no. 16)
- > swollen glands (especially at the back of the neck)
- > joint pain.

Symptoms, particularly joint pains, are more severe in adults.

Rubella is diagnosed by a blood test. Clinical diagnosis based on the appearance of the rash is not reliable.

Rubella is spread directly by mucous membrane (lining of nose and mouth) contact with infected airborne droplets from the nose and throat, and indirectly by contact with hands, tissues and other articles soiled by infected nose and throat discharges.

## Incubation period

*(time between becoming infected and developing symptoms)*

16 – 18 days with a range of 14 – 23 days.

## Infectious period

*(time during which an infected person can infect others)*

Up to 7 days before and at least 4 days after appearance of the rash.

## Treatment

There is no effective antiviral treatment for rubella. Treatment of the symptoms includes plenty of fluids and paracetamol, following the directions on the pack, for fever or joint pain.



**Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

## Control of spread

- > Rubella is best prevented by the measles-mumps-rubella (MMR) combination vaccine. Two doses of MMR are recommended for both girls and boys: one at 12 months and the second at four years of age.
- > Vaccination after exposure will not prevent infection.
- > All health care and child care staff (men and women) should be tested for immunity to rubella and if not immune, should be immunised.
- > All pregnant women should be tested for immunity to rubella prior to, or during early pregnancy. If found not to be immune, MMR vaccination is given after delivery of the baby but before discharge from the maternity unit. Rubella vaccine should not be given to a woman known to be pregnant and pregnancy should be avoided for one month after vaccination.
- > 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.

## Rubella (German Measles) (cont.)

### Control of spread cont.

- > Anyone with suspected rubella should consult a doctor both to check that the diagnosis is correct and so that contacts (particularly pregnant women) can be advised.
- > A person with rubella should be excluded from school or work until fully recovered or for at least four days after the onset of the rash.



**Rubella is a notifiable disease**

- > **Immunisation page 21**

# Salmonella Gastroenteritis

This is an infection of the bowel (bacterial gastroenteritis) caused by *Salmonella* bacteria. There are thousands of serotypes of *Salmonella* and they occur in many domestic and wild animals and birds, sometimes causing illness in them.

Symptoms may include:

- > fever
- > diarrhoea
- > loss of appetite
- > headache
- > stomach cramps
- > nausea and vomiting.

Sometimes there may be blood or mucus in the faeces. Dehydration is a serious complication. The illness may be particularly severe in young children, the elderly and people with immune suppression. A small percentage of people may develop arthritis after having a *Salmonella* infection.

Diagnosis is made by growing *Salmonella* bacteria from a faecal specimen.

*Salmonella* infection usually results from ingestion of the bacteria from contaminated food, water or hands. Raw or undercooked eggs, milk, meat or poultry are particularly high risk foods. Fruit and vegetables may also be contaminated, especially if manure has been used as fertiliser. People may become infected if they transfer animal faeces containing *Salmonella* bacteria from their hands to their mouths, for example, if eating after touching animals and failing to wash their hands. Person-to-person spread may occur when hands, objects or food become contaminated with faeces from people who are infected (the bacteria are then taken in by mouth).

## Incubation period

*(time between becoming infected and developing symptoms)*

6 – 72 hours, usually 12 – 36 hours.

## Infectious period

*(time during which an infected person can infect others)*

The faeces are always infectious when symptoms are present. Some people continue to carry *Salmonella* bacteria in the bowel and shed them in the faeces for months after recovering.

## Treatment

Recovery from *Salmonella* infection usually occurs within a week and antibiotic treatment is not normally required. However, infants, the elderly and people with immune suppression may require antibiotics (see also Typhoid and Paratyphoid).

Gastroenteritis is a common illness, which can be particularly serious in young children. Though antibiotic treatment is seldom recommended, there are several treatments that are useful for gastroenteritis of any cause.

Seek medical advice if any of the following symptoms occur:

### Adults

- > signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, feeling faint on standing
- > fever
- > severe abdominal pain
- > bloody diarrhoea.

### Children

- > signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, sunken eyes, feeling faint on standing
- > fever
- > abdominal pain
- > bloody diarrhoea
- > any symptoms in a child less than 12 months of age.

## Salmonella Gastroenteritis (cont.)

The following are general recommendations for the treatment of gastroenteritis:

- > Give plenty of fluids. Oral rehydration solution is highly recommended for children with mild to moderate dehydration. It is available at pharmacies and should be administered following the instructions on the packaging.
- > Mildly unwell children should be given their usual fluids more often. Carbonated (fizzy) drinks or undiluted juice should be avoided.
- > Medicines to prevent vomiting or diarrhoea should not be given (especially in children), except where specifically advised by a doctor.
- > Breastfed babies should continue to be breastfed throughout their illness.
- > Children on formula or solid diets should restart their normal diet (including full strength lactose containing milk) following rehydration with oral rehydration solution.
- > Children who are hungry or ask for food should be given small portions of their usual foods, but avoid foods high in sugar or fat.

### Control of spread

- > Exclude from child care, preschool, school and work until there has been no diarrhoea for 24 hours.
- > Cook meat thoroughly, until the juices run clear.
- > Do not purchase dirty or cracked eggs.
- > Strict food handling procedures should be used when preparing dishes containing raw or incompletely cooked eggs, such as home made ice cream.
- > Do not consume unpasteurised milk.
- > Follow good food handling procedures.
- > Follow good hand washing and keeping areas clean procedures.
- > Recognise the risk of *Salmonella* infections in pets. Chickens, ducklings, tropical freshwater fish and turtles are particularly risky for small children.
- > Wash hands after handling raw meat, especially chicken.

### Control of spread cont.

- > Always wash fruit (including melons) and vegetables before eating. If home grown, wash them before bringing them into the house.
- > Infected people who no longer have symptoms should take special care with hand washing if they are involved in food preparation or in caring for patients in hospital, the elderly or children.



**Salmonella infection is a notifiable disease**

- > Serotype page 6
- > Hand Hygiene page 13
- > Keeping Areas Clean page 14
- > Preventing Food Poisoning at Home page 15
- > Typhoid and Paratyphoid page 143
- > Collecting a Faecal Sample page 155

# SARS

## (Severe Acute Respiratory Syndrome)

Severe acute respiratory syndrome (SARS) is a respiratory illness caused by a virus called SARS associated coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. Over the next few months the illness spread to more than two dozen countries in Asia, North America, South America and Europe, before the SARS global outbreak of 2003 was contained. There was a second small outbreak in China in 2004.

There is no evidence at this stage of ongoing transmission anywhere in the world. It is not known if a SARS epidemic will recur.

The organism that causes SARS is a new type of virus belonging to the family of viruses, coronaviruses, which are one of the virus families that cause the common cold. Coronaviruses have been found in many different animal species including birds and mammals. SARS-CoV is thought to have passed from animals to humans through close contact, butchering or eating undercooked meat in parts of Southern China.

SARS is spread from someone who is unwell with the illness via contaminated droplets produced when coughing or sneezing, or via contaminated hands. People in very close contact with a sick SARS patient are at most risk. Rarely, the virus may be spread in the air from very ill patients.

Symptoms of SARS include:

- > SARS usually begins with a high fever (temperature greater than  $>38^{\circ}\text{C}$ )
- > cough
- > pneumonia
- > breathing difficulties (about 20% require artificial ventilation in an intensive care unit)
- > headache
- > chills
- > muscle aches
- > poor appetite
- > dizziness
- > diarrhoea (10-20 % of patients)
- > sore throat.

These symptoms are commonly seen with other types of infection and are not specific to SARS. During the outbreak, SARS was suspected if a patient had a fever of  $38^{\circ}\text{C}$  or greater, respiratory symptoms and a history of travel to a SARS affected area or close contact with a known SARS patient within 10 days before the fever or respiratory symptoms started.

There are several laboratory tests used to detect SARS-CoV and other causes of respiratory illness.

The main way that SARS seemed to spread was by close person-to-person contact. The virus that causes SARS is thought to be transmitted most readily by respiratory droplets (droplet spread) produced when an infected person coughs or sneezes. Droplet spread can happen when droplets from the cough or sneeze of an infected person are propelled a short distance (generally up to 1 metre) through the air and deposited on the mucous membranes of the mouth, nose or eyes of persons nearby.

The virus also can spread when a person touches a surface or object contaminated with infectious droplets and then touches his or her mouth, nose or eyes. In addition, it is possible that the SARS virus might spread more broadly through the air or by other ways that are not now known.

### Incubation period

*(time between becoming infected and developing symptoms)*

Usually 2 – 7 days, although it may be up to 10 days.

### Infectious period

*(time during which an infected person can infect others)*

This is not known for sure, but is thought to be for less than 21 days after the onset of symptoms. People who are infected with the virus but do not yet have symptoms are not thought to be infectious.

# SARS (Severe Acute Respiratory Syndrome) (cont.)

## Treatment

No specific antiviral treatment is available for SARS.

### Control of spread

- > Special precautions are needed for people who are suspected of having SARS and their carers. These will be made available by public health authorities if SARS recurs.
- > In general, to reduce spread of respiratory infections:
  - stay at home if you are sick
  - wash your hands often and well, with soap and running water
  - wash your hands especially after going to the toilet, after blowing your nose or sneezing, and before preparing food
  - cover your nose and mouth with a tissue when you sneeze or cough and dispose of it appropriately.



**SARS is a notifiable disease**

> [Hand Hygiene page 13](#)

# Scabies

Scabies is an infestation of the skin caused by the scabies mite *Sarcoptes scabiei*. The mite is very tiny, 0.2-0.4mm long, and cannot easily be seen without magnification. It occurs worldwide and in all races and social classes. Scabies is not an indication of poor hygiene.

Scabies and other mites usually infest the skin especially where there are creases, such as between the fingers (colour plate no. 17), on the front of the wrists and in the folds of the elbows, armpits, buttocks and genitals. When mites have been transmitted from animals (such as dogs) to people, the mites are commonly found on areas of skin having contact with the animal, including forearms, chest and neck. However, mites from animals cannot breed on humans, so do not cause ongoing infestation. Scabies mites cause intense itching, especially at night. Thread-like 'tunnels', approximately 10mm long, may be visible as grey lines in the skin, but they are often difficult to detect. Scabies infection may appear on the genitals as small itchy lumps.

Scabies and other mites that cause skin disease are diagnosed by examining skin scrapings with a microscope.

Scabies is usually transmitted by direct skin-to-skin contact, or rarely, by underwear or bed clothes that have been freshly contaminated by an infested person. The mites can survive for only a few days off the human or animal body.

## Incubation period

*(time between becoming infected and developing symptoms)*

Itching begins 2 – 6 weeks after infestation in individuals not previously exposed to scabies and within 1 – 5 days for individuals previously exposed.

## Contagious period

*(time during which an infested person can transmit the infestation to others)*

Until the mites and eggs are destroyed by treatment. People can be contagious even before the itching begins.

## Treatment

Skin disease caused by mites can easily be confused with other skin diseases. Treatment should not be undertaken until the diagnosis has been confirmed by a doctor, following examination of skin scrapings for mites. This is particularly important for babies, pregnant women or people who already have other forms of skin disease. Babies under 12 months of age need special treatment. Treatment involves application of insecticidal cream, lotion or solution as prescribed by a doctor.

## Control of spread

- > People with mites should be excluded from child care, preschool, school or work and may return on the day following treatment.
- > All close (skin-to-skin) contacts and other people in the same household should be treated at the same time, even if no itching or other symptoms are present. By the time scabies is diagnosed in one person, many other people may have been infested. If everyone is not treated at the same time, treatment is likely to be unsuccessful.
- > Contaminated underwear, bed linen and other clothing worn by infested persons in the 48 hours prior to treatment should be washed with hot water and detergent. All items such as toys which cannot be washed or dry-cleaned should be placed in a plastic bag for four days to kill any mites or eggs.
- > Mattresses and upholstered furniture can be vacuumed or gently ironed.

## Useful website

- > **Scabies**  
<http://www.health.sa.gov.au/pehs/topics/topic-scabies.htm>

# School Sores (Impetigo)

This is a superficial skin infection caused by *Staphylococcus* or *Streptococcus* bacteria, or sometimes both, most common in children.

Impetigo appears as a flat, yellow, crusty or moist patch on the skin, usually on exposed parts of the body such as the face and legs. The sores are often greater than 1 cm in diameter (colour plate no. 9).

Diagnosis is based on clinical examination. Dry, cracked skin serves as an area for growth of the *Streptococcus* and *Staphylococcus* bacteria. The bacteria can easily spread to other parts of the infected person's body or to other people directly by contact with sores or indirectly by contact with contaminated clothes.

## Incubation period

*(time between becoming infected and developing symptoms)*

4 – 10 days.

## Infectious period

*(time during which an infected person can infect others)*

As long as there is discharge from the sores. School sores are extremely contagious.

## Treatment

The doctor may recommend the use of antibiotic ointment, or antibiotics by mouth in severe cases.

Any sores on exposed surfaces should be covered with a watertight dressing.

### Control of spread

- > Persons with school sores should be excluded from child care, preschool, school and work until appropriate treatment has commenced. Any sores on exposed surfaces should be completely covered with a dressing.
- > Good hand washing procedures should be encouraged.

- > **Hand Hygiene page 13**

# Shigella Infection

This is a bowel infection (gastroenteritis) caused by *Shigella* bacteria.

Symptoms may include:

- > diarrhoea (sometimes with blood or mucus)
- > fever
- > vomiting
- > stomach cramps.

Mild infections or infections without symptoms may occur. The most severe infections occur in the very young, the elderly and malnourished people.

The infection is diagnosed by growth of *Shigella* from a faecal specimen.

Spread takes place when hands, objects or food become contaminated with faeces of people who are infected and the bacteria are taken in by mouth. Small numbers of *Shigella* bacteria are sufficient to cause an infection, so stringent control measures are required.

The only significant source of infection is other people, as *Shigella* does not infect animals and does not survive very long outside of the human body. However, flies can carry the bacteria on their legs and contaminate uncovered food. Infections can occur when people ingest food or water freshly contaminated with faeces.

## Incubation period

*(time between becoming infected and developing symptoms)*

1 – 7 days, usually 1 – 3 days.

## Infectious period

*(time during which an infected person can infect others)*

While symptoms are present and until *Shigella* are no longer present in the faeces (usually within 4 weeks after illness). Rarely, people without symptoms can shed *Shigella* in their faeces for many months. After appropriate antibiotics, *Shigella* stop being shed in the faeces within a few days.

## Treatment

Specific antibiotic therapy is available and will reduce the duration and severity of symptoms and the spread of infection. Gastroenteritis is a common illness which can be particularly serious in young children. There are several treatments which are useful for gastroenteritis of any cause. The following are general recommendations for the treatment of gastroenteritis.

Seek medical advice if any of the following symptoms occur:

### Adults

- > signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, feeling faint on standing
- > fever
- > severe abdominal pain
- > bloody diarrhoea.

### Children

- > signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, sunken eyes, feeling faint on standing
- > fever
- > abdominal pain
- > bloody diarrhoea
- > any symptoms in a child less than 12 months of age.

The following are general recommendations for the treatment of gastroenteritis:

- > Give plenty of fluids. Oral rehydration solution is highly recommended for children with mild to moderate dehydration. It is available at pharmacies and should be administered following the instructions on the packaging.
- > Mildly unwell children should be given their usual fluids more often. Carbonated (fizzy) drinks or undiluted juice should be avoided.
- > Medicines to prevent vomiting or diarrhoea should not be given (especially in children), except where specifically advised by a doctor.
- > Breastfed babies should continue to be breastfed throughout their illness.

## *Shigella* Infection (cont.)

- > Children on formula or solid diets should restart their normal diet (including full strength lactose containing milk) following rehydration with oral rehydration solution.
- > Children who are hungry or ask for food should be given small portions of their usual foods, but avoid foods high in sugar or fat.

### Control of spread

- > Exclude from child care, preschool, school and work until there has been no diarrhoea for 24 hours.
- > Infected people without symptoms who are involved in food preparation or in caring for patients in hospital, the elderly or children should take special care with hand washing. They may require proof that they are no longer infectious (by providing a faecal specimen) before returning to work.
- > Follow good hand washing and keeping areas clean procedures.
- > When several people in one group are ill with *Shigella*, the local health authority may review sanitary and hygienic aspects of the areas commonly used by affected people to reduce the chance of repeat infection.



***Shigella* infection is a notifiable disease**

- > **Hand Hygiene page 13**
- > **Keeping Areas Clean page 14**
- > **Preventing Food Poisoning at Home page 15**
- > **Collecting a Faecal Sample page 155**

# *Staphylococcus aureus* including Methicillin-Resistant *Staphylococcus aureus* (MRSA)

*Staphylococcus aureus*, often referred to simply as 'staph' or 'golden staph', are bacteria commonly found on the skin and in the noses of healthy people. When bacteria are living on or in the human body, but are not causing infection, it is called 'colonization' and the person is said to be a 'carrier'. Humans are most often colonized with *S. aureus* in their noses but it is also found on the skin and other body sites. Over time, 20% of the population will almost always be colonized with *S. aureus*, 60% of the population will be colonized with *S. aureus* off and on, while another 20% are almost never colonized with *S. aureus*.

Occasionally, *S. aureus* can cause infection. These bacteria are one of the most common causes of skin infections such as pimples and boils. However, *S. aureus* can also cause serious and sometimes fatal infections (such as bloodstream infections, surgical wound infections and pneumonia). Skin-to-skin contact with a person carrying the bacteria on their skin (with or without symptoms) and sharing towels or linen can spread the bacteria, particularly within families.

Lack of hand washing during food preparation can result in *Staphylococcus aureus* from hands contaminating food, which may lead to food poisoning.

The diagnosis of *Staphylococcus aureus* infection is made by growing the bacteria from specimens such as pus or blood.

In the past, most serious *S. aureus* infections were treated with a type of antimicrobial agent related to penicillin. Over the past 50 years treatment of these infections has become more difficult because *S. aureus* bacteria have become resistant to many antibiotics. These bacteria are known as MRSA (methicillin-resistant *Staphylococcus aureus*). Infections with MRSA are no more serious than infections with other types of *Staphylococcus aureus*.

Traditionally, MRSA infections have been associated with hospitalisation, but in recent years an increasing number of people with MRSA infections appear to have acquired them in the community, with no history of hospital admission.

Recently, even more resistant types of *S. aureus* bacteria have been found, called vancomycin-intermediate *Staphylococcus aureus* (VISA) and vancomycin-resistant *Staphylococcus aureus* (VRSA). These are resistant to vancomycin, an antibiotic to which most *S. aureus* bacteria are usually susceptible and which is used to treat serious MRSA infections.

## Incubation period

*(time between becoming infected and developing symptoms)*

Some people can be colonized with *S. aureus* and never get an infection. For those people who do get an infection, the time from exposure to development of disease can be from days to years.

## Infectious period

*(time during which an infected person can infect others)*

As long as the organism is carried on the skin. A person does not have to have symptoms of infection to be able to transmit the bacteria.

## Treatment

Infections with *Staphylococcus aureus* (including MRSA) can be treated with appropriate antibiotics, although the resistance of available antibiotics is increasing. People who carry the germ on their skin or in their nose will only require antibiotics under special circumstances. Many common skin infections caused by *S. aureus* will heal without medical treatment. However, some skin infections will require incision and drainage of the infected site and some infections may require antibiotics. Most skin infections will heal within a few weeks, but more serious skin infections can take longer to heal if treatment is delayed or if ineffective treatment is given.

More serious types of *S. aureus* infections (such as pneumonia or bloodstream infections) typically require hospitalisation and treatment with intravenous antibiotics.

## *Staphylococcus aureus* including Methicillin-Resistant *Staphylococcus aureus* (MRSA) (cont.)

### Control of spread

- > Standard Precautions in the form of strict hand washing by care givers and good personal hygiene on the part of the infected person are the most effective means of control.
- > Boils and infected wounds should be covered with clean, dry dressings until they are healed. Pus or drainage from wounds is very infectious.
- > Clean your hands frequently with soap and water or an alcohol based hand rub, especially after changing bandages or touching wounds.
- > Dispose of used dressings promptly, in a sealed plastic bag.
- > Clothing, sheets and towels of an infected person should be washed with detergent in hot water. Ideally they should be dried in sunlight, or in a clothes dryer on the hot setting.
- > In hospital, there are some patients, such as those with wounds, where infection with MRSA could pose a special risk. Therefore when a hospital patient is found to carry or have an infection with MRSA, additional precautions may be taken to prevent transmission of MRSA. Use of single room with ensuite facilities is recommended. Staff and visitors should follow the hospital's recommended precautions.
- > Do not share razors, towels or similar items with others.
- > Persons with MRSA do not need to be excluded from child care, preschool, school and work unless infected skin lesions on exposed surfaces cannot be completely covered with a dressing.

- > **Hand Hygiene** page 13
- > **Preventing Food Poisoning at Home** page 15
- > **Handling Blood and other Body Substances (standard precautions)** page 19

# Streptococcal Sore Throat

This is a bacterial infection of the throat and tonsils caused by *Streptococcus pyogenes*.

Symptoms include:

- > fever
- > sore throat
- > tender, swollen glands in the neck.

Complications of this infection include:

## **Scarlet fever**

All the symptoms of throat infection plus a fine red rash, which first appears as tiny red bumps on the chest and abdomen. This rash may then spread all over the body. It looks like a sunburn and feels like a rough piece of sandpaper. It is usually redder in the armpits and groin areas. The rash lasts about two to five days. There is often also reddening of the tongue and the bumps on the tongue appear larger than usual, causing an appearance known as 'strawberry tongue'. After the rash is gone, often the skin on the tips of the fingers and toes begins to peel.

## **Quinsy**

An abscess (collection of pus) next to a tonsil.

## **Rheumatic fever**

A rare complication. Fever, joint pain and a skin rash develop soon after a sore throat. Later, inflammation of the heart (rheumatic carditis), or shaking and unsteadiness (Sydenham's chorea or St Vitus' dance) may occur.

## **Inflammation and reduced function of the kidney**

A rare complication.

Diagnosis is made by culture, or sometimes other tests, of a throat swab. A sore throat may also be caused by a viral infection and culture of a throat swab is the only way to distinguish between the two conditions.

Streptococci are spread by inhaling or swallowing infected airborne droplets (caused by sneezing or coughing). The droplets may contaminate hands or objects, such as drinking cups or eating utensils. Sometimes spread occurs by direct contact with infected wounds or sores on the skin. Streptococci may also be spread through consuming contaminated unpasteurised milk and milk products or other food.

## **Incubation period**

*(time between becoming infected and developing symptoms)*

1 – 3 days.

## **Infectious period**

*(time during which an infected person can infect others)*

Untreated people remain infectious for 2 – 3 weeks after becoming ill. Treated people are infectious for about 24 hours after appropriate antibiotic treatment begins.

## **Treatment**

Effective antibiotic treatment is available. To prevent potential complications, the course of antibiotics should be completed.

## **Control of spread**

- > Exclude until the person has received antibiotic treatment for at least 24 hours and feels well.
- > Cover the nose and mouth when coughing or sneezing.
- > Always follow good hand washing procedures.
- > Dispose of soiled tissues appropriately.
- > Do not share eating utensils, food or drinking cups.
- > Do not drink unpasteurised milk.
- > People with sore throats should not prepare food for others.

> **Hand Hygiene page 13**

# Syphilis

Syphilis is a bacterial infection caused by *Treponema pallidum*. Almost all cases occur as sexually transmitted infections, though an infected pregnant woman can infect her baby in the uterus or during vaginal delivery. Some babies with congenital syphilis are stillborn and others may have severe deformities.

Syphilis acquired as an adult has the following symptoms:

- > An incubation period of nine to 90 days (averaging three weeks) during which time the person has no symptoms.
- > A *primary* stage in which a hard, usually painless, ulcer called a chancre develops at the site of infection, usually on the genitals. Untreated, the primary chancre usually goes away within four weeks. There is often painless swelling of lymph glands during this stage. The chancre may be inside the vagina in women, or inside of the mouth or anus, depending on how the infection was acquired. The person may not know they have the infection.
- > A *secondary* stage occurs two to four months after infection, lasts several weeks and often comes back in the following two years. The most common feature is a flat, red rash over the whole body. Syphilis is one of the few causes of this sort of rash on the palms and soles. Many other symptoms commonly occur and almost any part of the body may be involved.
- > A latent period with no symptoms or obvious signs of disease usually lasts for the remainder of the person's life.
- > A tertiary (third) stage may occur in up to 30% of untreated individuals. In some cases the disease may involve the brain and spinal cord (neurosyphilis), or the heart and blood vessels (cardiovascular syphilis), producing severe complications, disability and even death.

Diagnosis of syphilis can be made during the primary stage by microscopic examination of a scraping from the base of the chancre, though this test is not commonly performed. Later, diagnosis is made by blood tests. Syphilis involving the brain and spinal cord is confirmed by testing of cerebrospinal fluid (fluid from around the brain and spinal cord).

## Incubation period

*(time between becoming infected and developing symptoms)*

9 – 90 days, with an average of 3 weeks from contact to the development of a chancre.

## Infectious period

*(time during which an infected person can infect others)*

During primary and secondary stages and possibly the first 4 years of the latent period. A person is no longer infectious 24 to 48 hours after starting appropriate antibiotic treatment.

## Treatment

Effective antibiotic treatment is available. Treatment needs to be supervised carefully and long-term follow-up is required, particularly for patients with late stage syphilis infection. Treatment of the mother during pregnancy may be sufficient to prevent foetal infection. Sometimes babies require an additional course of antibiotics after birth.

## Control of spread

- > No sex until treated.
- > Practise safer sex – use condoms or dental dams.
- > Sexual partners need to be contacted, tested and treated.
- > Pregnant women are screened for syphilis in early pregnancy (and again in late pregnancy if they are at increased risk of acquiring syphilis).
- > Testing to exclude other sexually transmitted infections is advisable.



**Syphilis is a notifiable disease**

- > **Avoiding Sexually Transmitted Infections (STI) page 20**

## Useful website

- > **Clinic 275**  
<http://www.stdservices.on.net/std>

# Tetanus

A disease of the nervous system caused by a toxin produced by the bacterium *Clostridium tetani*. This bacterium produces spores, which are resistant cells able to survive in the soil for many years.

Symptoms include painful muscle spasms, initially of the muscles of the neck and jaw (lockjaw), and later of the muscles of the trunk.

Tetanus is a very serious disease and is frequently fatal, particularly in infants and the elderly. It has become relatively common in intravenous drug users.

Diagnosis is made by clinical examination.

Bacteria causing tetanus are found in soil or human or animal faeces. The bacteria may contaminate puncture wounds, cuts, burns and complicated fractures. The initial wound is often quite trivial and may not have received medical attention.

## Incubation period

*(time between becoming infected and developing symptoms)*

1 day to several months, with an average of 10 days.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread does not occur.

## Treatment

Treatment requires the administration of antitoxin and antibiotics. Often prolonged treatment in the intensive care unit of a hospital is necessary.

## Control of spread cont.

Adults should receive a further booster at age 50 if they have not had one in the past 10 years. (Regular boosters at 10 yearly intervals are no longer recommended in Australia.) For adolescents and adults, the combined diphtheria-tetanus-pertussis vaccine (dTpa) is preferred, if not given previously, as it provides additional protection against pertussis.

- > After an injury, particularly if a wound is deep, dirty or contains a foreign object (for example, wood splinter), the wound should be cleaned immediately with disinfectant and medical advice sought regarding the need for further treatment to prevent tetanus.
- > Wear gloves while gardening.



**Tetanus is a notifiable disease**

- > [Immunisation page 21](#)

## Control of spread

- > Exclusion from work or school is not necessary.
- > Protection against tetanus is provided by tetanus vaccine. Tetanus vaccine is one of the components of vaccines routinely administered to children at two, four and six months of age, with booster doses at four years and 15 to 17 years (in South Australia this booster is offered to Year 9 school students).

# Thrush (Candidiasis)

Inflammation of the skin or mucous membranes (lining of the nose, mouth and genitals) usually caused by overgrowth of the yeast (a type of fungus) *Candida albicans*, though other species of *Candida* may also cause infections.

Thrush commonly occurs within the mouth in young infants, with symptoms of white spots or flakes that cannot be removed by gentle cleaning. It may also contribute to nappy rash. Thrush is also common in women, where it affects the vulva and vagina, causing itching and vaginal discharge. Some people develop candidiasis in folds of the skin, such as under the breasts, with the skin becoming red and very itchy.

Candidiasis is diagnosed by microscopic examination and growing the fungus from a scraping from the skin or mucous membranes.

*Candida albicans* is present in the bowel, mouth or vagina, or on the skin of a large proportion of healthy people. Babies are often infected at birth as they pass through the birth canal.

Often *Candida* is present and does not cause symptoms; however, it may multiply to the degree that it can cause symptoms requiring medical treatment. Some people are much more sensitive than others to the presence of even small numbers of these yeasts. Circumstances that encourage the overgrowth of *Candida* include:

- > hormonal changes (for example, pregnancy)
- > medication side effects, especially antibiotics
- > medical conditions such as diabetes
- > cancers and their treatment
- > HIV infection
- > the use of inhaled steroids for asthma.

## Incubation period

*(time between becoming infected and developing symptoms)*

Variable, 2 – 5 days in infants.

## Infectious period

*(time during which an infected person can infect others)*

Carriers of *Candida* remain infectious to a variable degree, but most infections are caused by yeasts carried in the person's own body.

## Treatment

Effective antifungal treatment is available from pharmacies or on prescription from a doctor.

## Control of spread

- > Follow good hand washing techniques.
- > Exclusion from child care, preschool, school or work is not necessary.

# Toxic Shock Syndrome (TSS)

Toxic Shock Syndrome (TSS) is a very rare but potentially serious illness that can affect males or females at any age, but is more common during adolescence. It is caused by particular strains of bacteria called *Staphylococcus aureus* (and less commonly *Streptococcus pyogenes*), which are able to produce a toxin. These bacteria are normally found on the skin, in the nose, armpit, groin or vagina of one in every three people, where they usually live without causing any health problems. In rare cases, the bacteria produce a toxin which can cause toxic shock syndrome in some individuals.

The symptoms of toxic shock syndrome are caused by the effect of the toxin on the body, rather than the bacterial infection itself.

Symptoms include:

- > a sudden onset of high fever
- > vomiting
- > diarrhoea
- > dizziness (from low blood pressure)
- > muscle aches
- > confusion and collapse
- > a sunburn-like rash present at the time of illness, followed by peeling of the skin on the palms and soles one to two weeks later.

Toxic shock syndrome is diagnosed by clinical examination. Sometimes bacteria producing toxin can be grown from the patient.

The majority of cases of TSS occur in women during menstruation, mostly associated with tampon use. There is no evidence that tampons directly cause TSS – the bacteria *Staphylococcus aureus* are the cause of the illness – not the tampon. This explains why women using pads, men and children can get TSS. However, women who use tampons during their period have a higher risk of TSS than women who do not. Cases have also followed surgery. In more than 30% of cases, no obvious bacterial infection can be found.

## Incubation period

*(time between becoming infected and developing symptoms)*

Uncertain, probably varies from case to case.

## Infectious period

*(time during which an infected person can infect others)*

Direct person-to-person spread does not occur.

## Treatment

Antibiotics are given. If severely ill, patients may need to be supported in the intensive care unit in a hospital.

## Prevention

- > If high fever, vomiting or diarrhoea develops during menstruation, stop using tampons and seek medical advice immediately. It may not be TSS but this must be verified because TSS can be dangerous if not treated in its early stages.
- > The risk of TSS may be reduced by using tampons intermittently during menstruation. Overnight, it is preferable to use a pad.
- > Take special care with personal hygiene during menstruation. Bathe or shower daily.
- > Wash your hands before as well as after inserting a tampon. Unwrap a fresh, clean tampon just before insertion and do not handle it more than is necessary. Discard any tampons you may have unwrapped and not used immediately. Insert the tampon gently and carefully.
- > Use the lowest absorbency tampon necessary.
- > Change the tampon as directed by the manufacturer's instructions.
- > Never insert more than one tampon at a time.
- > Remove tampons at the end of a period.

Women who have had an episode of toxic shock syndrome are at increased risk of a second episode. Therefore a doctor may advise against tampon use in women who have had TSS.

# Toxoplasmosis

An infection caused by a parasite *Toxoplasma gondii*. The parasite occurs worldwide and infection is very common.

*Toxoplasma* infection usually does not cause any symptoms. Occasionally fever and swollen glands can occur. Following recovery from an infection, a few parasites remain in tiny cysts in the muscles, lung, brain or other organs. If the immune system is severely damaged, for example by AIDS, organ transplants, or treatment for some cancers, the parasites in the cyst may reactivate and can cause serious illness.

If a woman becomes newly infected with *Toxoplasma* during pregnancy, the foetus can also become infected and suffer birth defects as a result. Foetal infection occurs when parasites in the infected mother's blood stream cross the placenta and enter the foetus. Reactivation of a previous *Toxoplasma* infection can also occur in pregnancy but the foetus is rarely affected.

The parasite is carried by cats and shed in cat faeces. It is also carried in the muscles of infected rodents (rats, mice etc.), pigs, sheep, kangaroos and other warm blooded animals including birds. Human infection occurs when the parasite is taken in by mouth. This most often results from eating raw or undercooked meat or unwashed salad vegetables, but also if hands become contaminated with cat faeces during gardening or cleaning cat litter trays. Eggs of the parasite may survive in moist soil for over a year.

Diagnosis is made by a series of blood tests, sometimes by PCR tests or by examining tissue with a microscope.

## Incubation period

*(time between becoming infected and developing symptoms)*

5 – 23 days.

## Infectious period

*(time during which an infected person can infect others)*

Person-to-person spread does not occur, apart from transmission of infection from pregnant mothers to their unborn children.

## Treatment

Antibiotic treatment is available for significant infections, including treatment during pregnancy if necessary.

## Control of spread

- > Avoid eating and handling raw meat. Humans are most likely to be exposed to the organism by eating infected meat, usually from sheep, pigs and kangaroos. Therefore avoiding infection involves cooking all meat thoroughly and washing hands and utensils after handling raw meat. All meat eaten by pregnant women should be cooked 'well done'.
- > Wash all vegetables thoroughly before eating, especially salad vegetables.
- > Since humans can be infected by exposure to eggs shed by cats, use gloves when emptying cat litter trays. Trays can be disinfected with boiling water. Eggs need over 24 hours to become infectious after being passed in the faeces, so clean litter trays daily. Cover sandpits when not in use, to prevent cats from using them as litter.
- > Cats should be fed dry, canned or cooked food. Discourage pet cats from hunting. Since eating rodents and birds infects cats, pet cats that do not hunt will not be exposed and do not pose a risk to their owners. Even if a cat does become exposed, it only sheds infective eggs in its faeces for about 10 days.
- > Wear gloves when gardening. Hands should be washed thoroughly with soap and warm running water after contact with soil.
- > Person-to-person spread does not occur, so exclusion of infected children and adults from school or work is not necessary.

- > PCR page 6
- > Preventing Food Poisoning in the Home page 15

# Trichomoniasis

This is an infection of the genital tract in both men and women, caused by a parasite called *Trichomonas vaginalis*.

In women, symptoms of trichomoniasis may include:

- > frothy yellow/green vaginal discharge which may have a foul odour
- > pain or discomfort during sexual intercourse
- > pain or discomfort when passing urine
- > low abdominal discomfort
- > there may be no symptoms.

In men, most infections are without symptoms, but some men have:

- > pain or discomfort when passing urine
- > epididymitis (inflammation of the storage tubes for sperm that are on top of the testes).

Diagnosis is made by microscopic examination or culture of discharge from the vagina or penis.

Trichomoniasis is spread by sexual contact. Re-infection appears to be common.

Having trichomoniasis is associated with increased risk of transmission of HIV infection if exposure occurs.

## Incubation period

*(time between becoming infected and developing symptoms)*

4 – 28 days, average 7 days, but symptoms may not develop.

## Infectious period

*(time during which an infected person may infect others)*

The duration of the infection, which may last for years. People with infections but who have no symptoms are still able to transmit the infection to others.

## Treatment

Treatment may be a single oral dose of an antibiotic, or may require a longer course of treatment. Pregnant women may be advised to use pessaries (tablets inserted into the vagina), as the oral drug is best avoided, if possible, during pregnancy.

## Control of spread

- > No sex, or use condoms, until completion of treatment.
- > Practise safer sex – use condoms or dental dams.
- > Partners need to be contacted, tested and treated. Even if partners have no symptoms, they may cause re-infection.
- > Testing to exclude other sexually transmitted diseases is advisable.

- > **Avoiding Sexually Transmitted Infections (STI) page 20**

## Useful website

- > **Clinic 275**  
<http://www.stdservices.on.net/std>

# Tuberculosis (TB)

This is an infection caused by a bacterium *Mycobacterium tuberculosis*.

Tuberculosis most commonly affects the lungs. In about 30% of cases the disease affects other parts of the body, such as lymph glands, bones or kidneys. Initial infection of the lung usually occurs during childhood and goes unnoticed. However, a few bacteria continue to survive at the site of infection. Later in life, the infection can reactivate and a serious lung infection occurs.

Symptoms may include:

- > tiredness
- > fever
- > night sweats
- > weight loss
- > cough
- > blood-stained sputum
- > chest pain
- > swollen lymph glands.

The diagnosis of tuberculosis is suspected on clinical examination, chest X-ray and by skin testing. The diagnosis is confirmed when *Mycobacterium tuberculosis* is grown from sputum or tissue specimens.

Spread occurs when infected airborne droplets (produced when a person with tuberculosis of the lung coughs or sneezes) are inhaled. Tuberculosis affecting other parts of the body is rarely infectious.

## Incubation period

*(time between becoming infected and developing symptoms)*

Symptoms, if they occur, are present about 4 to 12 weeks after an initial lung infection. The risk of reactivation of the initial lung infection and the development of serious lung infection is greatest within the first year or two after initial infection but some risk persists for life.

## Infectious period

*(time during which an infected person can infect others)*

Young children with an initial infection rarely spread the disease. Adults with reactivation of infection are most infectious when they are coughing and have not yet received treatment or are in the first few weeks of treatment.

## Treatment

People with tuberculosis should receive anti-TB drugs under the care of a doctor and/or the Chest Clinic. Completing a full course of therapy (of at least six months) is essential.

## Control of spread

- > The Chest Clinic, Royal Adelaide Hospital, is responsible for follow-up and treatment of all cases of tuberculosis in South Australia and should be informed if any person is suspected of having tuberculosis.
- > If a person is found to have tuberculosis, they should be excluded from school or work until treatment has been given and a medical certificate is produced from the appropriate health authority.
- > When a person is diagnosed with TB, the Chest Clinic will perform skin testing of family members and other close contacts and may request skin testing of fellow students or employees (to exclude significant exposure to, and risk of developing, tuberculosis).
- > Health care workers should have a pre-employment health screen, which includes a tuberculin skin test (Mantoux) to detect previous exposure to TB.

## Tuberculosis (TB) (cont.)

### Control of spread cont.

- > A vaccine (BCG) is available. The vaccine does not prevent tuberculosis infection but does reduce the risk of death from tuberculosis. In Australia, BCG is recommended for certain people who have a high risk of exposure to tuberculosis, but is not part of routine childhood vaccinations.



**Tuberculosis is a notifiable disease**

### Useful website

- > **Chest Clinic, Royal Adelaide Hospital**  
[http://www.rah.sa.gov.au/thoracic/health\\_programs/TBfactsheets.php](http://www.rah.sa.gov.au/thoracic/health_programs/TBfactsheets.php)

# Typhoid and Paratyphoid

These are systemic illnesses caused by the bacteria *Salmonella* Typhi (typhoid) or *Salmonella* Paratyphi (paratyphoid). Onset of illness is gradual, with:

- > sustained high fever
- > marked headache
- > malaise (feeling of unwellness)
- > decreased appetite
- > enlarged spleen which may cause abdominal discomfort
- > dry cough in the early stage of the illness
- > a flat rose-coloured rash which may be visible on the trunk
- > constipation or diarrhoea – constipation occurs more often than diarrhoea in adults.

Illness varies from mild with low-grade fever, to severe with multiple complications. Persons who do not get treatment may continue to have fever for weeks or months, and as many as 20% may die from complications of the infection. With treatment, the mortality rate falls to about 1%. Paratyphoid has similar symptoms to typhoid, though illness tends to be milder.

*Salmonella* Typhi lives only in humans. Persons with typhoid fever carry the bacteria in their bloodstream and intestinal tract. In addition, a small number of persons, called carriers, recover from typhoid fever but continue to carry the bacteria. Both ill persons and carriers shed *Salmonella* Typhi in their faeces and urine.

Diagnosis is made by growing the bacteria from the blood or bone marrow early in the illness. Later in the illness the bacteria can sometimes be isolated from urine or faeces.

Typhoid is common in areas of the world where hygiene standards are poor and water is likely to be contaminated with sewage. These illnesses are no longer common in developed countries, with most cases occurring in areas such as Asia, the Middle East, Central and South America, parts of southern Europe and Africa. Typhoid is very common in Indonesia and Papua New Guinea.

It is spread by eating food or drinking water contaminated by faeces or urine of patients and carriers. Common sources are water or ice, raw vegetables, salads and shellfish. If fruit and vegetables are washed in contaminated water they may cause illness.

## Incubation period

*(time between becoming infected and developing symptoms)*

From 3 days to more than 60 days; usually 8 – 14 days for typhoid and 1 – 10 days for paratyphoid.

## Infectious period

*(time during which an infected person can infect others)*

As long as the bacteria are shed in the faeces or urine, usually from the first week of illness until completely recovered. About 10% of untreated typhoid patients will be infectious for 3 months after onset of symptoms and 2-5% become permanent carriers. Fewer persons with paratyphoid become carriers.

## Treatment

Antibiotic treatment is available and particularly necessary in severe cases. It will also help to reduce carriage. Persons given antibiotics usually begin to feel better within two to three days and deaths rarely occur. Resistance to available antibiotics is increasing, so it remains important to take care to prevent yourself from being infected.

## Typhoid and Paratyphoid (cont.)

### Control of spread

- > When travelling to areas where typhoid and paratyphoid are common, avoid high risk food and drinks. Drink only boiled or treated water (with iodine or chlorine tablets) or bottled drinks, with no ice. These measures will also help protect you against other foodborne illnesses.
- > Always wash your hands after using the toilet and before eating, drinking and smoking.
- > Vaccines are available and are recommended for travellers to certain areas. These vaccines are not completely effective, so it is still important to take care with food and water. See your doctor or a travel medicine expert before you travel for advice on protecting yourself from typhoid and other diseases.
- > People with typhoid or paratyphoid should not prepare food for others until their doctor has declared that they are free of the disease.
- > Cases, household contacts and other contacts will be followed up by public health authorities. Cases cannot work as food handlers or in child or patient care until cleared by health authorities.
- > Antibiotic treatment helps reduce the time a person is infectious.



**Typhoid and Paratyphoid are notifiable diseases**

- > **Hand Hygiene page 13**
- > **Overseas Travel page 26**

# Viral Gastroenteritis

Viral gastroenteritis is an infection of the bowel caused by one of a number of viruses.

Symptoms usually last one or two days and include:

- > mild fever
- > nausea and vomiting
- > stomach cramps
- > diarrhoea.

Diagnosis is based on clinical examination. A faecal examination can sometimes identify the virus and should be performed to also rule out bacterial infection.

Spread is through contamination of hands, objects or food with infected faeces or vomit. The virus is then taken in by the mouth. Viral gastroenteritis may also be spread through coughing and sneezing.

## Incubation period

*(time between becoming infected and developing symptoms)*

24 – 72 hours.

## Infectious period

*(time during which an infected person can infect others)*

During illness and for at least 24 hours after symptoms have disappeared.

## Treatment

No specific antiviral drugs are useful for treating viral gastroenteritis. It is a common illness which may be particularly serious in young children. The following are general recommendations for the treatment of gastroenteritis:

- > Give plenty of fluids. Oral rehydration solution is highly recommended for children with mild to moderate dehydration. It is available at pharmacies and should be administered following the instructions on the packaging.
- > Mildly unwell children should be given their usual fluids more often. Carbonated (fizzy) drinks or undiluted juice should be avoided.
- > Medicines to prevent vomiting or diarrhoea should not be given (especially in children), except where specifically advised by a doctor.

- > Breastfed babies should continue to be breastfed throughout their illness.

- > Children on formula or solid diets should restart their normal diet (including full strength lactose containing milk) following rehydration with oral rehydration solution.

- > Children who are hungry or ask for food should be given small portions of their usual foods, but avoid foods high in sugar or fat.

- > Seek medical advice if any of the following symptoms occur:

- signs of dehydration, such as thirst and decreased urination, lethargy, dry mouth, sunken eyes, feeling faint on standing

- fever

- abdominal pain, especially if severe

- bloody diarrhoea

- any symptoms in a child less than 12 months of age.

## Control of spread

- > Exclude from child care, preschool, school and work until there has been no diarrhoea or vomiting for 24 hours.

- > Follow good hand washing and keeping areas clean procedures.

- > **Hand Hygiene page 13**

- > **Keeping Areas Clean page 14**

- > **Preventing Food Poisoning at Home page 15**

- > **Collecting a Faecal Sample page 155**

# Viral Meningitis

An infection of the covering of the spinal cord and brain caused by a variety of viruses, most commonly those associated with gastroenteritis (inflammation of the stomach and intestines). Viral meningitis is relatively common, but rarely serious, though symptoms may be severe. Recovery is usually complete.

Symptoms include:

- > headache
- > fever
- > vomiting
- > neck stiffness and joint pains
- > drowsiness or confusion
- > photophobia (discomfort on looking at bright lights).

In some cases of viral meningitis, the virus can be identified, by either blood tests or by growing the virus from specimens obtained from the throat, faeces or occasionally by lumbar puncture (removing a sample of fluid from around the spinal cord). An exact cause is identified in less than half of cases.

The viruses that can cause meningitis in humans may be spread from a variety of means including respiratory secretions or faeces.

## Incubation period

*(time between becoming infected and developing symptoms)*

Varies according to the specific infectious virus.

## Infectious period

*(time during which an infected person can infect others)*

Varies according to the specific infectious virus.

## Treatment

There is no specific treatment for most cases of viral meningitis. Some cases will need to go to hospital for specialised care and observation. It is important to drink plenty of fluids.

Paracetamol may be used for pain and fever.

**! Aspirin should not be given to children under 12 years of age unless specifically recommended by a doctor.**

## Control of spread

- > Follow good hand washing procedures and personal hygiene at all times.

- > [Hand Hygiene page 13](#)

# Warts (Common, Flat and Plantar)

Warts are lumpy growths in the skin caused by infection with human papilloma viruses, of which there are now more than 100 known types. Papilloma viruses which cause warts in humans infect only humans and occur worldwide. Animals have their own types of wart viruses, but these can not infect people. Different types of papilloma virus tend to infect different areas of the body (see also genital warts).

## **Common warts**

Develop on the skin of children and adolescents and mainly occur on the knuckles, the backs of the hands and the knees. Occasionally such warts appear as a group.

## **Flat warts**

Are flat-topped and are most common on the face and the back of the hands.

## **Plantar warts**

Occur on the soles of the feet and occasionally on the palms of the hands. They are found most commonly in older children and adolescents.

The wart virus is thought to be transmitted by direct skin-to-skin contact or by contact with contaminated surfaces (for example, floors).

## Incubation period

*(time between becoming infected and developing symptoms)*

2 – 3 months, but ranging from 1 – 20 months.

## Infectious period

*(time during which an infected person can infect others)*

Unknown, but at least as long as visible warts persist.

## Treatment

About 65% of warts will go away by themselves within two years. If treatment is necessary, the following may be used:

- > liquid nitrogen
- > chemical paint applications
- > surgical removal
- > laser therapy.

## Control of spread

- > Avoid direct contact with warts.
- > Wear shoes.
- > Wash hands after any contact with warts.
- > Exclusion from child care, preschool, school or work is not necessary.

> [Genital Warts page 59](#)

# Whooping Cough (Pertussis)

Whooping cough is a bacterial infection of the nose and throat caused by *Bordetella pertussis*.

The illness often begins with cold-like symptoms of runny nose, sore watery red eyes, low-grade fever and general unwellness, although these symptoms are not present in all people. After three to seven days, a dry cough develops. The cough is usually present for many weeks and may last for months. Coughing is classically paroxysmal, that is, a prolonged fit of coughing occurs. The coughing is immediately followed by a deep breath in, resulting in the typical whoop – hence the name ‘whooping cough’. Some people do not whoop, but coughing may be followed by vomiting.

Pertussis kills about 250,000 children worldwide every year and many surviving children are left with brain damage. Other serious complications include pneumonia, bleeding into the nose, eyes or brain, and development of hernias.

Pertussis is highly infectious, spreading by respiratory droplets to 70-100% of susceptible household contacts and 50-80% of susceptible school contacts. Epidemics occur every three to four years.

Maternal antibody does not give adequate protection against pertussis, so babies can be infected before they are old enough to be vaccinated.

In recent years many cases of pertussis have been recognised in adults and adolescents due to waning immunity. These individuals are a significant source for the transmission of infection to infants.

Diagnosis is most accurately made by PCR testing of mucus from the nose and throat, combined with clinical history, although blood tests are still used in some places.

## Incubation period

*(time between becoming infected and developing symptoms)*

6 – 20 days, most commonly 7 – 10 days.

## Infectious period

*(time during which an infected person can infect others)*

Pertussis is highly infectious when the ‘cold-like’ symptoms occur in the early stages. Without treatment, a person is infectious for the first 3 weeks of coughing. With appropriate antibiotic therapy, the person is no longer infectious to others 5 days after starting antibiotics.

## Treatment

Appropriate antibiotic therapy, given in the early stages of infection, may prevent or lessen the severity of symptoms. Treatment within three weeks of onset of the cough reduces the spread of the disease, though it may not lessen symptoms.

## Control of spread

- > Vaccination of infants at two, four and six months, followed by a booster dose at four years.
- > With older vaccines, side effects were more common as people got older, so vaccination was not recommended for people older than seven years. New vaccines have fewer of these side effects and a further single booster dose is now recommended in South Australia for:
  - school children in Year 9
  - parents planning a pregnancy
  - parents of a newborn baby, other adult household members, and grandparents if they will be in contact with the baby, before or as soon as possible after delivery
  - adults working with young children, especially child care workers in contact with very young infants
  - all health care workers, especially those caring for very young infants
  - adults who have had vaccination in the past are now encouraged to have a booster vaccination of the combined diphtheria-tetanus-pertussis vaccine (dTpa) at 50 years of age.

## Whooping Cough (Pertussis) (cont.)

### Control of spread cont.

- > Antibiotic treatment of the person with whooping cough and their household contacts will reduce the spread of the infection. It is important that anyone with suspicious symptoms see their doctor so that an accurate diagnosis can be made and treatment commenced, if necessary.
- > A person with whooping cough should be excluded from child care, preschool, school or work until five days after starting antibiotic treatment. If not treated, they should be excluded for 21 days from the start of symptoms.
- > Household and child care contacts (in the same child care group) of the case who have received less than three doses of a pertussis containing vaccine should be excluded from child care for 14 days from the last exposure to the infectious cases, unless they have already completed five days of recommended antibiotic treatment, in which case they may return.
- > Any child care, preschool, school or work contacts of a person with whooping cough should seek medical advice if they develop any symptoms.
- > In the case of a whooping cough epidemic, the guidelines for control of spread may change. The Health Department should be contacted for recommendations.



**Whooping cough (pertussis)  
is a notifiable disease**

- > PCR page 6
- > Immunisation page 21

# Worms

Worldwide, there are many worms that can infest the bowels of people, but most of them are not problems in Australia because of our climate and very good sanitation. Worms causing infection in people are parasites that live and breed mostly in the bowel. The most common worm in Australian children is the threadworm, *Enterobius vermicularis*, sometimes called the pinworm. Infection with other worms such as roundworms, hookworms and tapeworms is less common.

Threadworms are small, white, thread-like worms 2-13mm long. They are most common in children, but anyone of any age can be affected. They are not fussy about who they infect and having them does not reflect on the hygiene of a child's home. Domestic pets are not a source of infection.

Threadworms are caught when someone swallows the worm's eggs. The eggs hatch inside the bowel, where they live, then travel out through the anus (back passage) to lay their eggs on the skin there at night time. The eggs may be picked up on the fingers and transferred to the mouth if the child scratches their bottom or doesn't wash their hands after going to the toilet. However, the eggs may fall off into bedding or clothing, or be wafted into the air, settling on many surfaces in the home or school. They can survive for up to two weeks in the environment and can easily be picked up and cause infection in other people.

Symptoms of threadworm infection include an itchy bottom, irritability and behavioural changes, but most people have no symptoms.

Occasionally, with heavy infections, the thin adult threadworms may be seen on the surface of freshly passed faeces. Sometimes the worms can be seen around the child's anus, if examined with a torch at night time. However, the best method of diagnosis is by the 'sticky tape test'. To do this, press some clear sticky tape onto the skin around the anus first thing in the morning, before wiping or bathing. Then place the tape onto a glass slide or put it in a specimen container, so that your doctor can have it examined with a microscope to see if any eggs have been picked up by the sticky tape.

## Incubation period

*(time between becoming infected and developing symptoms)*

Symptoms of infection are associated with high worm numbers resulting from repeated infections and may not occur until several months after initial infection, if at all.

## Infectious period

*(time during which an infected person can infect others)*

Spread is possible as long as worms are present.

## Treatment

A single dose therapy is usually effective and is given to the infected person and each family member at the same time. You can buy worm treatment from your chemist, without a prescription. It is not necessary to treat children on a regular basis, just in case they have worms.

## Control of spread

- > Make sure children wash their hands after using the toilet and before eating.
- > Parents should seek medical treatment for infected children.
- > Change bed linen and underwear daily for several days after treatment. Normal hot water washing of clothes and bed linen will kill threadworm eggs.
- > Clean toilet seats and potties regularly.
- > Keep children's fingernails short.
- > Exclusion from child care, preschool, school or work is not necessary.

# Yersiniosis

This is a bacterial infection of the bowel caused by *Yersinia enterocolitica*. It occurs worldwide, but is fairly uncommon.

Many domesticated and wild animals carry *Yersinia* in their intestines. Spread to people occurs by eating food or water contaminated by infected human or animal faeces. Contact with infected pets and domestic stock may also cause infection.

Symptoms vary with age and are commonest in young children. They include:

- > fever
- > diarrhoea, often bloody in young children
- > abdominal pain and cramps
- > symptoms similar to appendicitis in older children and adults
- > joint pain occurs in half of affected adults.

The diagnosis is usually made by growing *Yersinia* from a faecal specimen.

*Yersinia* is able to multiply at temperatures in normal refrigerators, so sometimes if meat is kept without freezing large numbers of the bacteria may be present. It is also occasionally transmitted by blood transfusion as it is able to multiply in stored blood products. This is why people are asked not to donate blood if they have had diarrhoea recently.

## Incubation period

*(time between becoming infected and developing symptoms)*

Symptoms typically develop 4 – 7 days after exposure.

## Infectious period

*(time during which an infected person can infect others)*

Usually 2 – 3 weeks. If not treated with antibiotics, the organism may be shed in the faeces for 2 – 3 months.

## Treatment

Effective antibiotic treatment is available.

## Control of spread

- > Exclude from child care, preschool, school and work until there has been no diarrhoea for 24 hours.
- > Cook all meat thoroughly.
- > Good food handling procedures should be followed.
- > Follow good hand washing and keeping areas clean procedures.
- > Wash hands after contact with farm animals, pets, animal faeces or animal environments.
- > Don't drink unpasteurised milk.
- > Anyone with diarrhoea should avoid swimming in pools.



**Yersiniosis is a notifiable disease**

- > Hand Hygiene page 13
- > Keeping Areas Clean page 14
- > Preventing Food Poisoning at Home page 15
- > Collecting a Faecal Sample page 155



### 1. Chicken Pox and Shingles (Varicella-Zoster virus)

Image of Shingles. Image courtesy Dr David Gordon, Flinders Medical Centre, Adelaide, South Australia



### 2. Cold Sore (Herpes Simplex)

Image courtesy Public Health Image Library (PHIL), Department of Health and Human Services, Centers for Disease Control and Prevention (CDC-USA), Dr Herrmann



### 3. Conjunctivitis

Inflammation with yellow coloured, watery discharge



### 4. Fungal Infection of Nail

Image courtesy Associate Professor David Ellis, Mycology Unit, Women's and Children's Hospital, Adelaide, South Australia



### 5. Fungal Infection of Scalp

Image courtesy Associate Professor David Ellis, Mycology Unit, Women's and Children's Hospital, Adelaide, South Australia



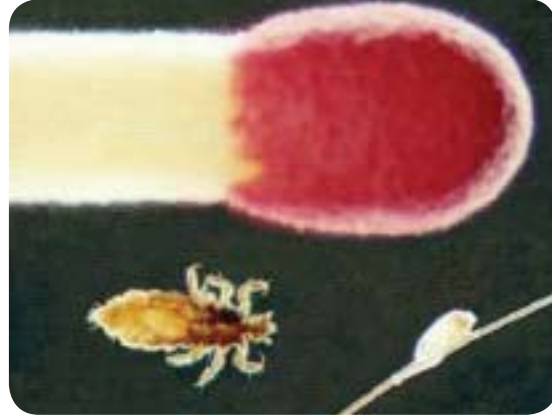
### 6. Hand Foot and Mouth Disease

Blistered hand Image courtesy Dr David Gordon, Flinders Medical Centre, Adelaide, South Australia

## Photographs



**7. Head Lice**  
Eggs on the hair and a louse on the finger nail



**8. Head Louse** and Head Louse Egg



**9. Impetigo**  
Dry cracked skin, often painful



**10. Viral Hepatitis – Jaundice**  
Image courtesy Public Health Image Library (PHIL), Department of Health and Human Services, Centers for Disease Control and Prevention (CDC-USA), Dr. Thomas F. Sellers/Emory University



**11. Measles**  
Image courtesy Public Health Image Library (PHIL) Department of Health and Human Services, Centers for Disease Control and Prevention (CDC-USA)



**12. Meningococcal Infection**  
Image courtesy Dr David Gordon, Flinders Medical Centre, Adelaide, South Australia

## Photographs



### 13. Mumps

Image courtesy Public Health Image Library (PHIL), Department of Health and Human Services, Centers for Disease Control and Prevention (CDC-USA)



### 14. Parvovirus (Slapped Cheek or Fifth Disease)

Image courtesy Public Health Image Library (PHIL), Department of Health and Human Services, Centers for Disease Control and Prevention (CDC-USA)



### 15. Ringworm

Image courtesy Associate Professor David Ellis, Mycology Unit, Women's and Children's Hospital, Adelaide, South Australia



### 16. Rubella

Image courtesy Department of Health and Human Services, Centers for Disease Control and Prevention (CDC-USA)



### 17. Scabies (*Sarcoptes scabiei* var. *hominis*)

Image courtesy Public Health Image Library (PHIL), Department of Health and Human Services, Centers for Disease Control and Prevention (CDC-USA)



### 18. Tinea Pedis

Image courtesy Associate Professor David Ellis, Mycology Unit, Women's and Children's Hospital, Adelaide, South Australia

## Collecting a faecal sample

### STEP 1

Use one of these methods to collect some of your faeces for testing at a laboratory

Hold a clean disposable plastic container underneath.



OR

Hold a clean plastic bag underneath.



OR

Stretch clean new cling-wrap across the toilet so it sags in the middle



### STEP 2

Use the scoop inside the lid of the container or a clean disposable spatula to transfer a small sample (cherry size) of faeces to the container.

Screw on the lid and wash your hands.



### STEP 3

Write on the label:

- your name
- your date of birth
- the date and time you collected the sample.

Keep the sample in a cool place.



### IMPORTANT

- Keep the faecal sample free from urine if possible.
- If blood or mucus are present in the faeces, some should be included in the sample.
- When you have transferred the sample to the container, dispose of the materials you used to collect it by wrapping in newspaper and putting in the rubbish immediately.
- Wash your hands.
- Deliver the sample as soon as possible to the doctor, laboratory or collection centre.
- If the sample cannot be delivered immediately, it should be refrigerated.

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For more information

**Communicable Disease Control Branch**

**PO Box 6**

**Rundle Mall SA 5000**

**Telephone: 08 8226 7177**

**Facsimile: 08 8226 7187**

**Email: [cdbc@health.sa.gov.au](mailto:cdbc@health.sa.gov.au)**

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