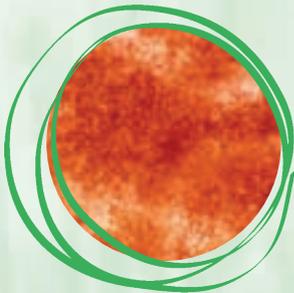




HEPATITIS C: ALL ABOUT THE VIRUS

- Hepatitis C is caused by a blood-borne virus that affects the liver.
- Transmission occurs when the blood of someone, who is already infected with the hepatitis C virus, enters the bloodstream of another person.
- At the end of 2006, an estimated 271,000 people living in Australia had been exposed to the hepatitis C virus. Of those 68,500 were estimated to have cleared the virus with the remaining 202,400 having a chronic infection.
- The number of new infections (incident cases) per year is estimated to be 9,700.
- The hepatitis C virus is a slow-acting virus, and for the majority of people, infection will not result in serious disease or death. Regular monitoring of a person with hepatitis C is important.



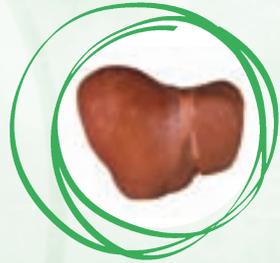
SUMMARY OF IMPORTANT POINTS

- There is currently no vaccine for hepatitis C; however, response rates to treatment are improving.

THE LIVER

The liver is a vital organ, located under the ribs in the upper right area of the abdomen. The liver has many different functions, including to:

- fight infection in the body;
- process digested food from the intestine and convert it into energy;
- control levels of fats, amino acids and glucose in the blood;
- manufacture bile, an important substance for the digestion of fats;
- neutralise and destroy drugs and toxins;
- store iron, vitamins and other essential chemicals;
- manufacture, break down and regulate numerous hormones; and
- make enzymes and proteins that are responsible for most chemical reactions in the body, e.g. those involved in blood clotting and repair of damaged tissues.



STRUCTURE AND FUNCTION OF THE LIVER

- The liver is the second largest organ in the body (after the skin) and weighs approximately 1.25 kg.
- It has a unique blood supply from two independent sources. It is supplied with oxygen-rich blood from the hepatic artery and with blood from the portal vein, coming from the intestines. All blood leaving the intestines reaches the heart and lungs only after passing through the liver, which enables the liver to filter nutrients, food and other substances absorbed from the bowel.
- The liver can grow new cells if existing ones are destroyed. Depending on the extent of damage to the liver, up to three-quarters can be removed and the remainder will re-grow to its original size and shape within a relatively short time.

FIGHTING INFECTIONS

- The liver plays a vital role in fighting infections, particularly infections arising in the bowel. It does so by mobilising part of the body's defence mechanism called the macrophage system. The liver contains over half of the body's supply of macrophages which can destroy any invading bacteria.
- If the liver is severely damaged, its ability to fight infections is impaired.

▶ WHAT IS HEPATITIS?

- Hepatitis means inflammation of the liver.
- Inflammation is the body's natural reaction to injury. Inflammation is sometimes associated with swelling and/or tenderness.
- Hepatitis has many causes including viruses, harmful consumption of alcohol and some chemicals.
- Five hepatitis viruses that can infect and inflame the liver have been identified to date; these are hepatitis A, B, C, D and E. These viruses are different and can be transmitted in different ways, but their effect on the liver is similar.
- When the liver is inflamed over a long period, it can develop scar tissue, which impairs its functioning. This scar tissue is known as fibrosis. Extensive scarring of the liver is called cirrhosis.

▶ WHAT IS HEPATITIS C?

The hepatitis C virus which causes hepatitis C was first identified in 1989. Before then, it was referred to as non-A, non-B hepatitis, or transfusion-related hepatitis. Hepatitis C affects millions of people around the world. Hepatitis C virus is a slow-acting virus and for the majority of people, infection will not result in serious disease or death.

Of new infections in Australia:

- 90% result from the sharing or re-use of contaminated drug injecting equipment; and
- 10% result from other causes which involve blood-to-blood contact (e.g. tattooing and body piercing with contaminated equipment, needlestick injuries and vertical transmission from mother to baby).

A test to screen the Australian blood supply for antibodies to the hepatitis C virus was introduced in 1990. Prior to then, up to 10% of new infections resulted from blood transfusion and receipt of blood products.

Research has shown that approximately 25% of people with hepatitis C will clear the virus within 2 to 6 months of becoming infected; however, they will continue to carry antibodies to the virus although these antibodies do not protect against reinfection. The other 75% of people who do not clear the virus will have an ongoing or chronic infection. After 20 years, approximately 7% of people with chronic hepatitis C will develop cirrhosis. This rises to up to 20% of people after 40 years. *See Section on Natural History below for details.*

There are a number of major strains of hepatitis C virus. These strains are called genotypes. It is possible for a person to become infected with different genotypes. There are Polymerase Chain Reaction (PCR) tests to identify genotypes and viral load. *See Chapter 4: Hepatitis C Testing for more information.* Prior infection does not protect against reinfection with the same or different genotypes of the virus. Individuals who clear the hepatitis C virus without treatment are not at risk of chronic liver disease unless they are re-infected with the virus. *See Section on Genotypes below.*

Current treatments for hepatitis C use pegylated interferon, most commonly in combination with ribavirin (combination therapy). This treatment provides an overall sustained response rate between 40% and 90% depending on the genotypes. See *Chapter 6: Treatments for Hepatitis C* for details.

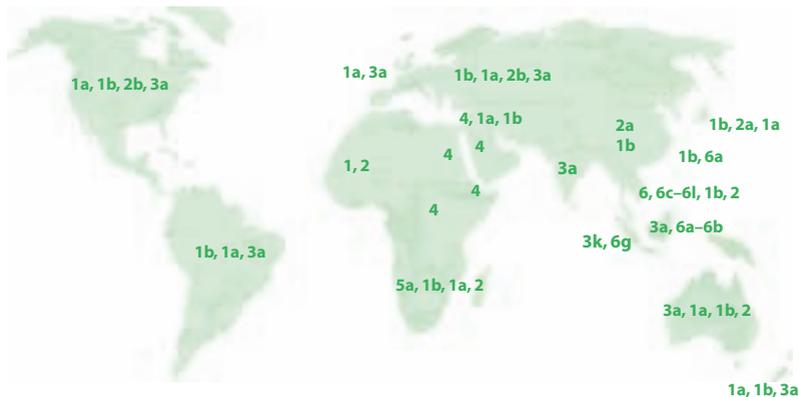
As yet, there is no vaccine to protect against infection with hepatitis C but worldwide there are substantial research funds being spent on vaccine development.

The hepatitis C virus is sometimes referred to as HCV, and commonly abbreviated to “hep C” in conversation.

HEPATITIS C GENOTYPES

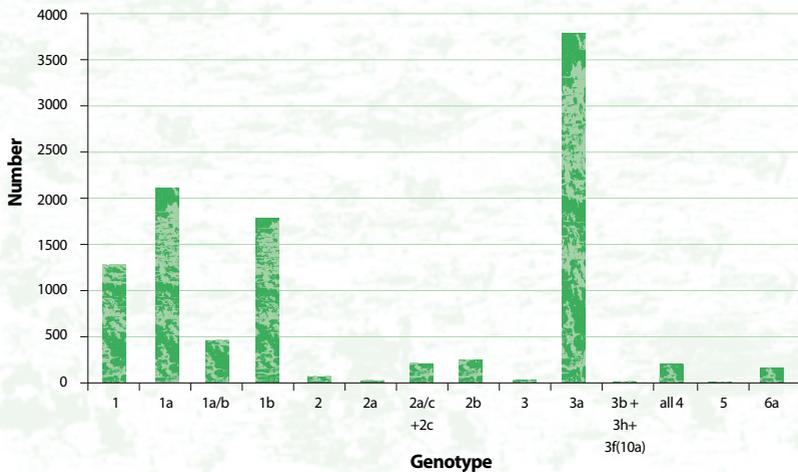
Genotype is the term used to describe the specific genetic structure of hepatitis C. There are believed to be six major hepatitis C genotypes (1–6), each of which can be further subdivided into subtypes (1a, 1b, 2a, etc). These genotypes are closely related in their genetic make-up but differ enough that scientists have classified them into distinct groups. Genotypes 1, 2 and 3 are widely distributed in developed countries while other genotypes appear to be more geographically localised, e.g. genotype 4 is found predominantly in the Middle East and Central Africa.

HEPATITIS C VIRUS GENOTYPES – WORLD VIEW



In Australia, the predominant genotypes are genotype 1 (54%) and genotype 3 (37%) with genotype 2 accounting for around 5%. Genotyping, the procedure for determining the specific hepatitis C genotype, is expensive because an initial PCR test (see Chapter 4: Hepatitis C Testing) is required to generate sufficient genetic material of the virus for the test. Genotyping has little use diagnostically, and is mainly used in decision-making about whether to undergo treatment and in determining the dose and duration of treatment. In certain circumstances, the genotyping test is covered under Medicare.

DISTRIBUTION OF HCV GENOTYPES IN AUSTRALIA 2006 (N=10433)



Reference: Bowden DS, Berzsenyi DM (2006). Chronic hepatitis C virus infection: genotyping and its clinical role. *Future Microbiol* 1: 103–112.

VIRAL LOAD

Determining the amount of hepatitis C virus in the blood (viral load) can help predict an individual's response to treatment. Monitoring the magnitude of the decrease in viral load while on treatment can give an early indication of the chances of treatment success. These tests are expensive but are covered under Medicare in certain circumstances. See Chapter 4: Hepatitis C Testing for more information.



TRANSMISSION OF HEPATITIS C

- For transmission to occur, the virus must be concentrated enough (viral load) to present a threat of infection.
- Hepatitis C is transmitted by blood-to-blood contact. This means that the blood of a person already infected with the virus must leave their body and enter the bloodstream of another person.
- Hepatitis C virus has been found in body fluids other than blood, but the viral load is thought to be too low for transmission to occur.
- The hepatitis C virus enters the body of a person through a rupture or opening in the skin.
- Currently in Australia, the greatest risk for the transmission of the hepatitis C virus is through blood-to-blood contact through the sharing or re-using of contaminated needles and syringes, and other injecting equipment. Surfaces used for mixing, disposal containers, hands and puncture sites can become contaminated during the injecting process and also pose a risk of transmission.
- The Australian Red Cross Blood Service began screening for hepatitis C in February 1990. Before this time, some people were infected with hepatitis C when they received blood or blood products contaminated with the virus.
- Hepatitis C is not classified as a sexually transmissible infection (STI). Hepatitis C is transmitted through blood-to-blood contact, so sexual transmission is possible when there is blood-to-blood contact during sexual contact. *See Section on Sexual Transmission below for details.*

FACTORS INFLUENCING TRANSMISSION

Whether hepatitis C is transmitted in any particular situation depends on:

- the concentration of virus in the blood (or 'viral load').

There is limited information available about variations in the concentration of hepatitis C virus circulating in blood and other body fluids throughout the course of infection. There are some studies of mother-to-baby transmission and of needlestick injuries among health care workers that indicate that transmission is related to viral load.

DRUG PREPARATION AND INJECTING EQUIPMENT

The sharing or re-using of contaminated needles and syringes used during drug injecting is the most common mode of hepatitis C transmission in Australia. Transmission can also occur during the drug preparation and injecting process, through the sharing or re-using of other contaminated injecting items such as mixing spoons, swabs, water, needles, syringes, syringe plungers and tourniquets. Hands and surfaces used for mixing up can also become contaminated during preparation and injecting. Hand washing and general cleanliness are important for safer injecting.

It is important to remember that:

- even the smallest amount of blood which may not be visible to the naked eye can transmit hepatitis C; and
- blood is often present when people inject drugs, and while it is safer to inject in the company of others because of the risk of overdose, the sharing or re-using of ANY item of equipment poses a risk for hepatitis C transmission. *See Chapter 3: Reducing Hepatitis C Transmission in the Community, sections on Harm Reduction and Safer Using for more details.*

BLOOD TRANSFUSION, BLOOD PRODUCTS AND BODY TISSUE(S)

- Transfusion-related hepatitis C is relatively rare in most developed countries since the screening of donated blood for hepatitis C antibodies was introduced. A commercial test for hepatitis C antibodies became available in Australia in 1990. Prior to this, the risk of acquiring hepatitis C (then called non-A, non-B hepatitis) through a transfusion was 0.19%. In Australia, additional molecular tests were introduced in June 2000 to screen donations for the genetic information of the hepatitis C virus, HCV RNA. Using the antibody test together with the molecular test, the chance of acquiring transfusion-related hepatitis C from a unit of blood has been estimated to be 1 in 3.6 million. Since the combined use of these tests in screening, no case of hepatitis C transmission has been recorded.
- Furthermore, people with declared risk factors for blood-borne viral infections (e.g. injecting drug use, recent tattooing or piercing), and people with hepatitis B, HIV or hepatitis C antibodies are generally excluded from donating blood, organs or body tissue. These have been important measures in preventing hepatitis C infection in people treated with plasma derived clotting factors. Synthetic clotting factors are now preferred for the treatment of haemophilia as these products contain little or no human or animal material which minimises the risk of transmission of hepatitis C or other viruses.



TATTOOING AND OTHER FORMS OF SKIN PENETRATION

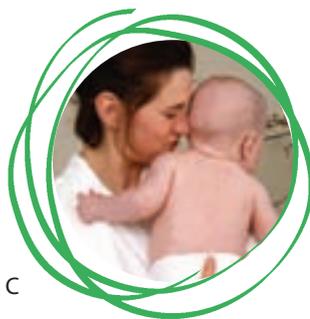
- Contaminated equipment used in tattooing can transmit hepatitis C.
- It is recommended that people seeking a tattoo visit a practitioner who uses standard infection control procedures. *See Chapter 3: Reducing Hepatitis C Transmission in the Community, Section on Standard Infection Control Procedures.*

- Other forms of skin penetration such as body piercing, body implants, scarification, branding, acupuncture and electrolysis are thought to present a risk of transmission, if non-sterile equipment or procedures are used.
- Some forms of beauty therapy involve skin penetration and if non-sterile equipment is used, there is a risk of hepatitis C and other blood-borne virus transmission.
- No one having a tattoo or other skin piercing is legally obliged to disclose their hepatitis C status (except in WA).

TRANSMISSION IN THE HEALTH CARE SETTING

- Risk of transmission in the health care setting is low. It occurs mainly through needlestick or sharps injury, through handling items contaminated with blood and through a break down in infection control procedures.
- The risk of transmission of hepatitis C in a health care setting due to a needlestick injury ranges from 2%-8%.
- In the absence of adequate precautions, blood spills may present a transmission risk. *See Chapter 2: Hepatitis C, Other Viruses and HIV for information about hepatitis B, and Chapter 3: Reducing Hepatitis C Transmission in the Community for information on Standard Infection Control Procedures.*
- There have been reported cases of hepatitis C transmission through blood splashes to the eye. These events are rare but health workers should not ignore the risk.
- In general the risk of transmission of hepatitis C in the health care setting is low provided standard infection control precautions are followed. However, a small number of infections occurring in the clinical setting have been reported where there has been a break down in infection control procedures.

MOTHER TO BABY TRANSMISSION (VERTICAL TRANSMISSION)



- All babies, born to women who have hepatitis C, will test antibody positive at birth because they acquire their mother's antibodies.
- The risk of mother-to-child transmission of hepatitis C is approximately 5%.
- By the age of 18 months, 92%–95% of babies will have cleared their mother's antibodies and these babies will test negative for hepatitis C.
- Current research about the timing of transmission from mother to baby is inconclusive. There is some evidence that transmission occurs during pregnancy, while other studies indicate that transmission occurs during delivery. In the absence of conclusive data, there is no recommendation for caesarean section over vaginal delivery. The use of forceps and scalp electrodes should be avoided during delivery (if clinically appropriate) as they can break the baby's skin and antenatal procedures such as amniocentesis also carry a potential risk of transmission.
- There is usually no benefit in testing babies for hepatitis C antibodies, but if parents are still concerned following counselling, then testing should only be carried out after the child reaches 18 months of age.
- Where parents are insistent on PCR testing to exclude hepatitis C infection before the child is 18 months, it is suggested that testing be delayed until the baby is at least 2 months of age as the results from PCR testing are unreliable on samples obtained earlier. The consequences of a positive result must be carefully considered in pre-test counselling.

Factors which increase the risk of transmission from mother to child during pregnancy include:

- HIV and hepatitis C co-infection in the mother (10–15% risk of transmission);
- A high viral load or concentration of the hepatitis C virus in the blood;
- An increased period of time between membrane rupture and delivery; and
- The use of a device which penetrates inside the body, either through a body opening or the skin (invasive devices) such as foetal monitors.

BREASTFEEDING

- Hepatitis C has been found in breast milk, but the levels of virus are not thought to be high enough to pose a transmission risk.
- Because the health benefits of breastfeeding are universally recognised and outweigh the low risk of hepatitis C transmission, women with hepatitis C are encouraged to breastfeed their newborn babies.
- Women with hepatitis C who have cracked or bleeding nipples are advised to express and discard milk from that breast until lesions are healed, as blood may be present in the breast milk.
- To learn more about breastfeeding positions and techniques that may help to prevent cracked nipples, health workers should advise women to consult with a lactation consultant or midwife at a maternity hospital or women's health centre.

TRANSMISSION IN THE HOME

- There is no evidence that people with hepatitis C transmit the virus to others with whom they share accommodation or household utensils such as cups, toilets or laundry facilities.
- Sharing personal grooming items, such as toothbrushes, razors and body piercing jewellery, which may be contaminated with infected blood or fluids, poses a low transmission risk. *See Chapter 3: Reducing Hepatitis C Transmission in the Community, section on Household Transmission.*

SEXUAL TRANSMISSION

- Hepatitis C is not classified as a sexually transmissible infection (STI).
- While sexual contact is not dismissed as a route of hepatitis C transmission, the evidence from studies of sex-partners of people with hepatitis C suggests that the risk is extremely low, and exists only when blood-to-blood contact occurs during sex.

- Reported cases of sexual transmission of hepatitis C have involved blood-to-blood contact in the course of sexual activities, e.g. through the use of sex toys, during menstruation, during sex that causes abrasions in the delicate skin of the genitals or anus, or the presence of an STI which involves sores or ulcers.
- There are a number of recent reports internationally which suggest an increased risk of transmission of hepatitis C between men who have sex with men (MSM) who are also HIV positive (2–5% risk of transmission). There is no data available on the risk of transmission of hepatitis C for women who are HIV positive.
- There have been studies into sexual transmission of the hepatitis C virus, but many of these have been limited by small sample size, lack of control groups, or failure to exclude other risk factors, particularly histories of injecting drug use. In particular, prospective studies have not provided clear evidence of sexual transmission in the absence of other potential risk factors. Additional evidence is needed to define the precise risk of sexual transmission.



➤ ACUTE AND CHRONIC INFECTION

ACUTE INFECTION

- ‘Acute hepatitis’ refers to the first stage of hepatitis C infection which some people experience soon after they become infected. The term ‘acute’ means a short term illness or disease and does not refer to the severity of the disease.
- This phase of infection is often very mild, lasts less than 6 months (often less than 12 weeks) and it goes unnoticed in most people.
- Although only a small minority of people experience symptoms in the acute phase (estimated to be about 10%), it is important for health care workers to

be alert to the symptoms of infection, such as nausea, dark urine, jaundice and abdominal discomfort.

- A person may have abnormal liver function tests at this time, even though no symptoms are present.
- A person with recognised acute infection should be referred to a liver specialist, an infectious diseases specialist or a specialist treatment centre for consideration of early treatment. Accessing treatment early can result in higher clearance rates and a simplified treatment regime (monotherapy).
- Hepatitis C is cleared from the body without medical intervention in about 25% of people within 2–6 months of infection.
- Antibodies to the virus remain in individuals even after viral clearance, but may decline in time. Antibodies do not protect against reinfection with the same or a different genotype of the virus. *See Chapter 4: Hepatitis C Testing, and Chapter 6: Treatments for Hepatitis C.*

CHRONIC INFECTION

- The term 'chronic infection' refers to an infection that has been ongoing for more than 6 months.
- The term refers specifically to the duration of infection, not to the severity of the disease.
- Hepatitis C virus can exist in the body for years without causing symptoms.
- Chronic infection with hepatitis C virus may lead to liver damage.



NATURAL HISTORY

The natural history of a disease is defined as its progression in the absence of any medical treatment or other intervention over a designated period of time.

The natural history of a condition includes interactions that occur between the person infected, the factor(s) causing the disease and the environment, beginning

CHRONIC HEPATITIS C OUTCOMES CHART (NATURAL HISTORY)

On average, one of every four people who contract HCV will clear their infection naturally within the first 12 months. Three of every four people will develop chronic (ongoing) hep C

Of 100 people with chronic hep C who remain untreated



with the onset of the disease and finishing with either death or recovery. In the case of hepatitis C, recovery refers to viral clearance.

It should be noted that the natural history of hepatitis C-related disease is difficult to document accurately in individual cases. The above chart shows the different outcomes that may occur with chronic hepatitis C. It does not aim to show individual outcomes or prognosis.

HOW IS NATURAL HISTORY USEFUL?

Understanding the natural history of a disease is important as it:

- provides a way to make an informed prediction (prognosis) about what might happen in the future to the health of the person affected;
- helps to formulate effective treatment(s) for the illness; and
- allows governments to more effectively plan for future health services and costs.

It is important to remember that, to date, natural history studies have concentrated on people who were infected with hepatitis C through blood or blood products. Given that the majority of infections in Australia today are a consequence of sharing or re-using contaminated items of injecting equipment, tracking the progression of hepatitis C is still a challenge for the medical community.



HEPATITIS C IN AUSTRALIA

The earliest evidence of hepatitis C in Australia can be found in stored samples of blood taken from people admitted to Fairfield Hospital in Victoria in 1971. All these people presented at Fairfield Hospital with acute hepatitis, and all had previously injected illicit drugs. Almost 60% of samples contained antibodies to the hepatitis C virus, then known as non-A, non-B hepatitis. In a similar cohort from Sydney in the early 1970s, 84% had hepatitis C virus antibodies.



Injecting drug use was probably introduced into Australia in the late 1960s although it remained relatively uncommon in the early 1970s. Fairfield Hospital admissions data from 1971 to 1975 suggest that non-A, non-B hepatitis was spreading rapidly among people who were injecting drugs. Subsequent growth of the hepatitis C epidemic has been fuelled by increasing numbers of people injecting drugs and sharing items of injecting equipment contaminated with infected blood.

DIAGNOSES AND EXPOSURE CATEGORIES

Hepatitis C is a notifiable disease. For the period 1990–2005, over 225,000 people in Australia tested positive for hepatitis C antibodies. Annually, there are around 12,000–14,000 notifications of hepatitis C infection which makes hepatitis C one of the most commonly reported infectious diseases to the National Notifiable Diseases Surveillance System. More than 80% of these notifications reported histories of injecting drug use. Over more recent years, there has been an encouraging 25% decline in the diagnosis of hepatitis C infection, with the rate per 100,000 population dropping from 81.3 in 2002 to 61.1 in 2006. The decrease has been largely attributed to reductions in the prevalence of injecting drug use, however, reductions in risk behaviour relating to drug injecting among young people or changes in the rate of testing may also contribute.

It is important to note that nearly all of these notifications are for prevalent (existing) hepatitis C cases and not for cases of newly acquired hepatitis C. Transmission modes involving blood exposure were identified for almost all notifications. The reported number of diagnoses of newly acquired hepatitis C infections has been relatively stable for the period 2002–06 at around 450 with injecting drug use as the major exposure category.

The introduction of universal screening of blood donors in Australia in 1990 has virtually eliminated hepatitis C transmission via blood transfusions and blood products, which before this time, were the only other major routes of transmission besides injecting drug use.

ESTIMATED PREVALENCE AND INCIDENCE

Using mathematical modelling, the Hepatitis C Virus Projections Working Group has estimated hepatitis C prevalence and incidence in Australia. Some refinement of the data has recently been done and described in the *Annual Surveillance Report of the National Centre in HIV Epidemiology and Clinical Research, 2007*. The report has estimated that:

- around 271,000 people in Australia were hepatitis C antibody positive by the end of 2006 (prevalence);
- of these, 202,400 were estimated to be chronically infected;
- over 80% of the people with hepatitis C virus antibodies living in Australia were estimated to have been exposed through injecting drug use and 10% were from countries of high hepatitis C prevalence;
- 22,000 Aboriginal and Torres Strait Islander people were estimated to have hepatitis C antibodies;
- there were estimated to be 9,700 new hepatitis C infections in 2005 (incident cases) with nearly 90% exposed through injecting drug use; and
- hepatitis C prevalence rates in antenatal patients, health care workers and first time blood donors are all less than 1%.

PREVALENCE AND INCIDENCE IN PEOPLE WHO INJECT DRUGS

Most Australian studies of hepatitis C in people who inject drugs indicate the prevalence in this group to be 50% or more. Reported hepatitis C transmission occurs at the highest rate among adults aged less than 30 years, predominantly those with a history of injecting drug use. Annual measurements of hepatitis C in people who have attended Needle and Syringe Programs have found the prevalence ranged from 56% in 2002 to 62% in 2006. Other Australian studies have confirmed that transmission of hepatitis C in people who inject drugs is continuing at a high rate. This is in marked contrast to HIV, which remains at a very low prevalence among this group in Australia.

Hepatitis C continues to spread among people who inject drugs in Australia while HIV does not, because of:

- the very high prevalence of hepatitis C which existed before Harm Reduction Programs such as Needle and Syringe Programs began in response to the emergence of HIV; and
- the high 'infectiousness' of hepatitis C compared with HIV. *See Chapter 2: Hepatitis C, Other Hepatitis Viruses and HIV.*

Current hepatitis C incidence among people who inject drugs is around 15 infections a year per 100 people, but studies have suggested that this figure may be higher in some sub-populations. There is some evidence of an overall decline in prevalence between 2000 and 2006, with the proportion of people attending needle and syringe programs who reported having injected drugs for three years or less dropping from 10% in 2002 to 5% in 2006; within this group the hepatitis C prevalence fell by half to 18%. However, there is little evidence of a decrease in hepatitis C incidence among some groups of people who inject drugs, Aboriginal and Torres Strait Islander people and people who are in, or have ever been in prison.

PREVALENCE IN OTHER POPULATIONS

Hepatitis C prevalence is high in populations of people detained in custodial settings. This is mainly because many inmates report a history of injecting drug use. In addition, transmission of hepatitis C in custodial settings is facilitated by the absence of options for safer injecting and the presence of unsafe tattooing practices. Recent studies indicate that one in three male prisoners now has hepatitis C antibodies and that two thirds of all female inmates are, or have been infected with hepatitis C. These figures equate to up to half of the total fulltime prison population (estimated to be around 25,000 persons) being infected. The high rates of injecting drug use in custodial settings, coupled with higher incarceration rates, place Aboriginal and Torres Strait Islander people at increased risk of initiation into drug use and hepatitis C infection. One of the key findings of the NSP survey 2005–2006 was the increasing number of participants with Aboriginal and Torres Strait Islander backgrounds who had hepatitis C virus antibodies. *See Chapter 8: Education and Training, section on Hepatitis C Education in Custodial Settings for more details.*

High prevalence rates also exist among Australians with bleeding disorders, who, as part of their treatment, received infected blood or blood products before donor screening for hepatitis C began in 1990. This includes many men

with haemophilia, some carriers and some people with Von Willebrand disease. Some men with haemophilia also have HIV (acquired before donor screening for HIV antibodies was introduced in 1985). This state of infection with two, and sometimes three separate and unrelated viruses is known as co-infection. See *Chapter 2: Hepatitis C, Other Hepatitis Viruses and HIV* for more details.

Hepatitis C amongst culturally and linguistically diverse populations in Australia tends to mirror prevalence in the country of birth. The prevalence of hepatitis C in some countries in Africa, the Eastern Mediterranean, South-East Asia and the Western Pacific (where data are available) remains high compared to Australia. The *Hepatitis C Virus Projections Working Group: Estimates and Projections of the Hepatitis C Virus Epidemic in Australia, 2006* reports that the estimated incidence in new immigrant arrivals in Australia with the hepatitis C virus is 3.3% (860 out of a total estimated 25,799). These immigrants come from countries of high hepatitis C prevalence. Of the 860 people with hepatitis, 46.8% came from China/Hong Kong; 20.1% from Egypt; 11.2% from the Philippines; 8.3% from Malaysia; 6.0% from Vietnam; 4.5% from Pakistan; 2.4% from Cambodia and 0.7% from Italy.

Since the screening of donated blood was introduced into Australia, new hepatitis C infections have been largely confined to people who inject drugs. A small number of transmissions related to tattooing or skin piercing have been recorded, as well as transmission from mother to baby. A few transmissions in medical and hospital settings have occurred through needlestick injuries or through a breakdown in infection control procedures. However, most new infections occur through blood-to-blood contact through activities associated with injecting drug use.

It is clear that efforts to prevent further infections must be a priority for people who currently have hepatitis C, and for those who are at risk of infection through behaviours that potentially transmit the virus.

COMMONLY ASKED QUESTIONS

I HAVE NEVER SHARED A NEEDLE WITH ANYONE: HOW DID I GET INFECTED WITH HEPATITIS C?

Hepatitis C is transmitted through blood-to-blood contact. If you have ever injected drugs, it may be that the virus was transmitted through sharing equipment contaminated with blood other than a needle or syringe (e.g. tourniquet, water, swab etc). If you have never injected drugs, then you may have been exposed to the virus in other ways, such as a pre-1990 blood transfusion or unsafe tattooing or body piercing practices.

SHOULD I BE CONCERNED THAT I HAVE HEPATITIS C?

Hepatitis C is not necessarily life-threatening, and you may not feel ill. However, it is very important to maintain your general health through reducing alcohol consumption, eating a balanced diet, maintaining a healthy body mass index, exercising, taking adequate rest and having regular medical check-ups. Another reason to be concerned is the possibility that you could pass on the virus to others through unsafe behaviours. To avoid this, you need to be blood aware. Because it is possible to become re-infected with the same or another hepatitis C genotype, it is important always to practice safer behaviours. *See Chapter 3: Reducing Hepatitis C Transmission in the Community.*



I HAVE HEPATITIS C AND I HAVE A NEW BABY. IS IT SAFE FOR ME TO BREASTFEED?

The decision to breastfeed is an individual decision. However, the advantages of breastfeeding are universally recognised and the risk of contracting hepatitis C through breastfeeding is low and can be minimised. Breastfeeding should be discontinued if the nipples are cracked or bleeding. When the nipples have healed, breastfeeding can be resumed. Advice about the best way to breastfeed can be sought from a lactation consultant. *See the Section on Vertical Transmission in this chapter for additional information, and Chapter 4: Hepatitis C Testing.*

HOW MANY OTHER PEOPLE HAVE HEPATITIS C?

Current estimates suggest that around 271,000 Australians have been infected with hepatitis C, and that there are about 10,000 new infections annually. It is estimated that 180 million people worldwide have hepatitis C (World Health Organisation, 2006).

HEPATITIS C: THREE DECADES OF DEVELOPMENT

1971: Blood samples taken from people who had injected drugs and stored (admitted to Fairfield Infectious Diseases Hospital, Melbourne in 1971); blood tested in 1990 showed a majority have antibodies to hepatitis C. These people are diagnosed with non-A, non-B hepatitis.

NOVEMBER 1986: In response to the emerging HIV epidemic, the first Needle and Syringe Program opens in NSW.

1988: Scientists in the USA report the discovery of the hepatitis C virus, and patent its genetic make-up (the first time the genetic structure of a living organism is patented).

1989: Identification of hepatitis C is confirmed in *Science*, April 1989. The description non-A, non-B hepatitis is discontinued.

1989: AusHep 1, the first of several Australian interferon clinical trials is initiated.

1989: Australian Intravenous League (AIVL) commences and operates as an unfunded national network until 1998.

1990: Following the development of a diagnostic test for hepatitis C antibodies, Australia's donated blood supply is made safer from potential hepatitis C transmission with the introduction of screening in February 1990.

1990: Hepatitis C becomes a notifiable disease in Australia.

NOVEMBER 1991: Australia's first hepatitis C support group is established in NSW, to provide information, support and advocacy for people with hepatitis C. Haemophilia Foundations, already dealing with issues of haemophilia and HIV, also establish hepatitis C support providing individual counselling and information groups.

OCTOBER 1994: The Australian Health Ministers' Advisory Council develops the *National Hepatitis C Action Plan* which recommends activities for surveillance and epidemiology, testing, clinical management, counselling, education, prevention and research.

OCTOBER 1994: Interferon monotherapy (6-month course) is funded under Section 100 of the Pharmaceutical Benefits Scheme (PBS), following Therapeutic Goods Administration (TGA) approval for use in Australia in December 1992.

1995: Australia's first State-based hepatitis C strategy is produced in Victoria.

AUGUST 1996: The Commonwealth Government sponsors a report entitled *Meeting the Needs of People in Australia Living with Hepatitis C*.

DECEMBER 1996: Hepatitis C is incorporated into the *Third National Strategy on HIV/AIDS*. The Australian National Council on AIDS becomes the Australian National Council on AIDS and Related Diseases (ANCARD), incorporating hepatitis C.

MARCH 1997: The National Health and Medical Research Council (NHMRC) launch the report, *Strategy for the Detection and Management of Hepatitis C in Australia*.

1997: The Australian Hepatitis Council is established as the peak body to represent state-based hepatitis C organisations.

1997: The Commonwealth Government allocates funds for research and national education programs on hepatitis C.

1998: AIVL receives first funding for the *National Hepatitis C Education & Prevention Program among People Who Use Drugs Illicitly*.

FEBRUARY 1998: Federal Health Minister, Dr. Michael Wooldridge, announces a funding allocation for social and behavioural research into hepatitis C.

MARCH 1998: The Commonwealth Department of Health and Community Services funds two distinct national education programs, administered by the national peak bodies, the Australian Hepatitis Council (AHC) and the Australian Intravenous League (AIVL).

NOVEMBER 1998: The world's first parliamentary inquiry into hepatitis C tables its first report in NSW, titled *Hepatitis C: The Neglected Epidemic*.

JANUARY 1999: The Commonwealth Department of Health and Aged Care publish *Hepatitis C: A Review of Australia's Response*.

1999: The Commonwealth Government makes funding available over four years for community-focused hepatitis C education and prevention initiatives.

NOVEMBER 1999: Funding for the Hepatitis C Policy Program commences.

MARCH 2000: The world's first mass media hepatitis C campaign to raise public awareness is launched in NSW.

JUNE 2000: Nucleic Acid Testing (NAT), capable of detecting minute amounts of hepatitis C genetic material, is introduced into Australian Blood Bank screening.

JUNE 2000: Australia launches the *National Hepatitis C Strategy 1999–2000 to 2003–2004*, a world first in terms of a comprehensive public health response to hepatitis C.

MARCH 2001: The world's first formal inquiry into hepatitis C-related discrimination is launched in NSW.

NOVEMBER 2001: Australian Intravenous League changes its name to Australian Injecting & Illicit Drug Users League (AIVL).

2002: Commonwealth Department of Health and Ageing Funds first ever national meeting of Needle and Syringe Programs (NSPs) The meeting calls for support for Anex as the peak body for NSPs.

2002: The world's first ever national publication for NSPs (the Anex Bulletin) is published to keep staff updated on NSP-related issues. The Anex Bulletin becomes a key part of information and support for the Australian NSP sector.

2002: ANCD releases a position paper on NSPs recommending NSPs be trialled in Australian prisons.

OCTOBER 2002: Australian Government Department of Health and Ageing releases the evaluation report, *Return on Investment in Needle and Syringe Programs in Australia* (Michael Drummond, NCHECR).

JANUARY 2003: Australasian Society for HIV Medicine pilots HCV maintenance prescriber program in NSW.

AUGUST 2003: Release of *National Hepatitis C Testing Policy*, produced by ANCAHRD.

SEPTEMBER 2003: Release of the review of the *National Hepatitis C Strategy 1999–2000 to 2003–2004, The Road not Taken*.

NOVEMBER 2003: Pegylated combination therapy is listed on Australia's PBS S100 subsidised drugs scheme.

2004: Second national meeting of NSPs supports Anex as the national voice for NSPs.

MAY 2004: Launch of the first National Hepatitis C Awareness Week.

JUNE 2004: Senate Committee report *Inquiry into Hepatitis C and Blood supply in Australia* is released.

JUNE 2005: Launch of the second *National Hepatitis C Strategy 2005–2008*.

JUNE 2005: AIVL receives first funding for Treatment Services Users Project.

OCTOBER 2005: Launch of *National Aboriginal and Torres Strait Islander Sexual Health and Blood Borne Virus Strategy*.

NOVEMBER 2005: Release of report, *Economic Evaluation of Hepatitis C in Australia* commissioned by the Department of Health and Ageing.

APRIL 2006: Removal of liver biopsy from S100 criteria to access treatment.

MAY 2007: Updated edition of *National Hepatitis C Testing Policy*, is produced by the Hepatitis C Subcommittee of MACASHH.