Unit 1

Bird flu

Avian influenza, also known as bird flu, is a type A influenza virus. It is lethal to poultry and is potentially fatal in humans. Bird flu spreads between both wild and domesticated birds. It has also been passed from birds to humans who are in close contact with poultry or other birds. There is no clear evidence that the virus can be transmitted from human to human. However this may have happened in rare cases, where a person has become ill after caring for a sick family member. Scientists are concerned that the bird flu virus may combine with a human flu virus and mutate, which may make transmission between humans possible. The strain of bird flu presently affecting Asia is the H5N1 strain. This strain has killed more than 130 people in Indonesia, Vietnam, Cambodia Thailand, Turkey, Azerbaijan, Egypt, China, and Iraq since 2003.

Bird flu in Australia

There are no reports of the current bird flu strain in Australia, either among birds or people. There have been five previous bird flu outbreaks in Australia among commercial flocks, all of which were contained and eradicated. The last outbreak was in 1997 in Tamworth in New South Wales.

How the virus is spread

Water birds such as wild ducks are believed to be the carriers of all avian influenza type A viruses. The viruses are carried inside the birds’ intestines and are distributed into the environment via bird faeces. Migratory birds infected with the virus could potentially spread the bird flu to any of the countries they visit. Wild birds don’t usually show symptoms of bird flu, although the currently circulating H5N1 strain has caused illness and death in some wild birds. The avian influenza virus can more frequently kill domesticated birds, such as chickens and turkeys. Symptoms in birds differ according to the species but can include diarrhoea, breathing difficulties, swollen head and death. A sick bird sheds the virus in its feathers, mucous, saliva and faeces.

Humans who have close contact with sick birds are at risk of infection with bird flu. For example a person may handle a sick bird, contaminate their hands with chicken faeces, and forget to wash their hands before eating. They will then ingest the infected bird faeces. This is the most common way for a human to catch the bird flu. The virus can also survive in raw poultry meat but is destroyed during normal cooking. There is no evidence that the current circulating H5N1 strain of bird flu can be spread easily from human to human.
Symptoms in humans

Although there have been too few human cases to determine the exact incubation period of bird flu, it would be expected to be from three to 10 days. The symptoms of bird flu in humans are similar to those of regular influenza and include:

- Fever
- Sore throat
- Cough
- Headache
- Aching muscles.

Complications

Bird flu in humans can cause a range of serious and potentially fatal complications, including:

- Eye infections
- Pneumonia, including viral pneumonia
- Acute respiratory distress
- Inflammation of the brain and heart.

Tell your doctor if you have been to a country where there is bird flu

If you have recently returned from a country that had an outbreak of bird flu and you get flu symptoms, see your doctor immediately. When making the appointment, tell the clinic staff about your travel including any visits to markets, farms or anywhere else where birds were present.

Influenza viruses can mutate

Influenza viruses that infect animal species can mutate and infect humans. The human immune system may have no defences against viruses that previously only infected animals. That’s why infection with these viruses can result in more severe disease in people. If the H5N1 bird flu virus were to mix with a human influenza virus, such a ‘combined’ virus could create a new human influenza virus that could spread rapidly.

Health experts are concerned that the current bird flu affecting parts of Asia, The Middle East, Africa, and Europe could become a worldwide pandemic if the virus does mutate. The worst influenza pandemic in modern history was the Spanish flu, which occurred in 1918–19 and killed up to 50 million people.

Measures to contain the spread of the current bird flu virus include identifying and culling affected poultry flocks, research into tests and vaccines, and rigorous quarantine practices.

Australia is ready to respond to an outbreak

Federal and State governments have been working together to plan their response to an outbreak of bird flu. An episode of bird flu in Australia would trigger the Australian Action Plan for Pandemic Influenza, a Federal government plan. Victoria also has a Pandemic Influenza Plan, which details the steps that will be used by state government agencies and health services to manage an outbreak.

A separate Federal government plan, the Australian Veterinary Emergency Plan, is designed to manage bird flu outbreaks among bird populations such as poultry farms. Key measures to prevent an outbreak of bird flu include keeping wild birds and domesticated birds apart, and making sure that domesticated birds have a safe supply of drinking water.
Treatment and vaccines

Several antiviral medications used to treat human influenza are also effective for bird flu. These could be used if a person developed symptoms after possible exposure to avian influenza, or to prevent illness in a person who was in close contact with avian influenza. At present people living in Australia, or people making short visits to affected countries, do not need to have antiviral medications. However Australians living in countries affected by avian influenza should consider having access to a supply of antiviral medication, to be used on medical advice.

The Australian government is stockpiling Relenza and Tamiflu, two drugs that may be used in the treatment of human cases of bird flu. In the case of an outbreak in humans, these drugs would be used to maintain essential services, prevent transmission and provide treatment for people who are already ill.

A vaccine against bird flu is in development, but is not currently available. The current influenza vaccines will not protect humans against bird flu. However, people who may be exposed to bird flu should consider being vaccinated against human influenza viruses to reduce the risk of the viruses ‘mixing’ to form a new flu strain.

Advice for travellers and Australians living overseas

People making short visits to affected countries do not need to have antiviral medications. However Australians living in countries affected by avian influenza should consider having access to a supply of antiviral medications, to be used on medical advice. This may include having a supply of antiviral medications in their home, particularly if they live some distance from urban centres and cannot therefore ensure access to antiviral medications stored locally.

Be aware of the risk of bird flu if you are travelling to, or living in, a country where outbreaks are occurring in birds or humans. Suggestions include:

- Avoid contact with wild or domesticated birds. Don’t go to farms or market places.
- Stop young children from putting contaminated objects or their own fingers into their mouths.
- Eggshells may be contaminated with bird faeces. Wash eggs thoroughly before breaking and wash your hands thoroughly after handling eggs.
- Avoid foods that contain uncooked egg, such as mayonnaise.
- Wash hands, chopping boards and utensils thoroughly after handling raw poultry.
- Cook poultry at high temperatures. Cooking temperatures of 80°C or higher destroy the bird flu virus in about 60 seconds.

Things to remember

- Bird flu is spread between birds and from birds to humans.
- Exposure to birds, bird faeces or feathers is the most likely way for a human to catch bird flu.
- See a doctor immediately if you have recently returned from a country that has had an outbreak of bird flu and you get flu symptoms.
Unit 2
Breast awareness
It is important for women to become familiar with the normal look, feel and shape of their breasts so they will notice any abnormal changes.

Changes in breast tissue
Most changes in breast tissue are not cancerous, but there are some changes to look out for that could be a sign of breast cancer. Any of the following changes should be reported to a doctor:
• Lumps or lumpiness
• Size changes
• Changes in breast shape
• Skin changes, such as puckering or dimpling
• Areas of thickened breast tissue
• Changes to the nipples, such as discharge or inversion (pulling in).
If you notice any abnormal changes to your breasts or the area around your breasts, including your armpits, see your doctor.

Looking at your breasts
Become familiar with the way your breasts normally look so that you are more likely to notice any changes. It is suggested you:
• Stand topless in front of a well-lit mirror.
• Look at your breasts while holding your arms by your sides, on your hips and above your head.
• Note the shape, size and skin texture of each breast.
• Note the shape, size and skin texture of each nipple.

Feeling your breasts
You can feel your breasts while lying down or in the shower (women with larger breasts may be more comfortable lying down). There is no right or wrong way to check your breasts, but remember to feel all the breast tissue; from the collar bone to below the bra line, and in the armpits.

See your doctor if you notice any unusual changes
If you find a lump or thickening, or if you notice any unusual breast changes, see your doctor. The earlier breast cancer is detected and treated, the better the chances of recovery. However, it is important to remember that, in most cases, lumps that women find are not cancer. Some noncancerous conditions that can cause breast lumps and thickenings include:
• Hormones - some women’s breasts become swollen and lumpy around the time of menstruation.
• Fibroadenomas - lumps made up of normal fibrous and glandular tissue.
• Cysts - small, fluid-filled sacs.
• Microcalcifications - spots of calcium salts.
• Radial scars - star-shaped abnormalities within the breast that form for unknown reasons. Radial scars are usually benign, but may contain cancer cells in some cases.

Screening
For women aged between 50 and 69, regular screening mammograms, every two years, are the best way to detect breast cancers. To book a mammogram, call BreastScreen on 13 20 50.
Male breast cancer

Breast cancer in men is rare, accounting for less than one per cent of all breast cancers and less than one per cent of all cancers in men. Male breast cancer is usually detected in men aged between 60 and 70.
Men who notice lumps or other changes in the breast area should see a doctor. Early detection can significantly improve recovery for male breast cancer. The prognosis for men with breast cancer is similar to that of women at the same stage of cancer.

Things to remember
• Be familiar with the normal look and feel of your breasts.
• If you notice any abnormal changes to your breasts, see your doctor.
• Most changes in breast tissue are not cancerous.
• If you’re aged between 50 and 69, have a screening mammogram at Breast Screen every two years.
Breastfeeding - dealing with mastitis

Mastitis means inflammation of the breast. It can be caused by blocked milk ducts (non-infective mastitis) or a bacterial infection (infective mastitis). If a blocked milk duct is not cleared, flu-like symptoms such as fever, aches and pains will probably develop. Milk duct blockages cause milk to pool in the breast. This forms an ideal environment for bacteria growth and can lead to an infection.

Symptoms

Blocked milk ducts (‘non-infective mastitis’) can cause the breast, or parts of the breast, to become:
- Tender or painful
- Reddened
- Hard.

When mastitis is caused by a bacterial infection (‘infective mastitis’):
- The breast becomes red, swollen, hot and painful.
- The skin may appear tight and shiny, and be streaked with red.
- You feel very ill (‘flukey’) and have a high temperature (over 38°C).

How mastitis develops

Factors that predispose a woman to blocked milk ducts include:
- Poor drainage of the breast – this can be caused by poor attachment of the baby at the breast or limiting the baby’s time at the breast
- Engorgement of the breast due to a missed feed or delaying a feed
- A tight or ill-fitting bra, or consistently lying in one position during sleep
- Holding the breast too tightly during feeding
- Trauma such as a kick from a toddler or pressure from a seatbelt.

Infective mastitis occurs when there is overgrowth of bacteria in the breast, which the body is unable to fight. Factors that predispose a woman to infective mastitis include:
- Poor physical health
- Nipple trauma caused by incorrect attachment of the baby during feeds
- The use of nipple creams, which can harbour bacteria
- An untreated blocked milk duct.

Preventing infective mastitis

To help prevent infective mastitis:
- Mothers and midwives should thoroughly wash their hands before touching the breasts after a nappy change.
- Make sure the baby is positioned and attached properly on the breast.
- Avoid sudden long periods between feeds. Feed frequently.
- Wear loose, comfortable clothing. Bras, if worn, should be properly fitted.
- Avoid nipple creams, ointments and prolonged use of nipple pads.

Treatment

Measures that can help treat blocked milk ducts include:
- The baby feeding well on the affected breast – offering the affected breast first can help
- The application of heat before a feed, gentle massage of the affected area during feeding,
and cold packs after a feed for comfort
• A change in feeding position
• Frequent drainage of the breast through feeding and expressing.
If the blockage does not clear within 8 to 12 hours, see your doctor.

Treatment for **infective mastitis** should begin immediately. You should consult your doctor. Options include:
• Continued breastfeeding to drain the breast
• Antibiotics, for example flucloxacillin or cephalexin
• Anti-inflammatory medication (such as ibuprofen) or analgesia (such as paracetamol) to relieve pain, if necessary
• Rest and adequate fluid intake
• Heat before a feed and cold after
• Varying the feeding position to increase breast drainage.
If you wish to stop breastfeeding, it is important to wait until the infection has cleared up. Rapid weaning may lead to a breast abscess.

**Things to remember**
• Mastitis is caused by a blocked milk duct or a bacterial infection.
• Continued breastfeeding is the most important part of the treatment for mastitis.
• See a doctor promptly if your breast is red, hot and tender, doesn’t clear up using the measures outlined above and you feel flu-like symptoms with a temperature.
unit 4
Exercise - everyday activities
To stay fit and healthy we need to exercise regularly. Research suggests that maintaining an active lifestyle is the key to good health and weight management. You can plan physical activity by doing things like going to the gym or playing sport. You can also do lots of everyday things to help use those kilojoules and keep you fit. Increasing the amount of everyday exercise in your life can make a big difference. Try to incorporate at least four everyday activities into each day.

The car
Suggestions include:
• Walk to the corner shops instead of driving.
• Cycle to work one or two days every week.
• Walk to the bus stop or train station, and catch public transport to work.
• If taking the bus or tram, get off one stop early and walk the rest of the way.
• Park the car a fair distance from the entrance of the shops and walk, rather than parking right out front.
• Wash and vacuum the car yourself instead of taking it to a car wash.

In the workplace
Suggestions include:
• Take the stairs instead of the lift.
• Use at least half of your lunch break for a brisk walk, even if it is only 10-15 minutes.
• Stretch at your desk.
• When you need to talk to a colleague, don’t use the phone or internal email - get up from your desk and walk over to them.
• If your job involves sitting at a desk all day, make sure you get up and walk around for a few minutes every hour.

At home
Suggestions include:
• You might enjoy the housework a little more if you think about all the kilojoules you’re burning while pushing the vacuum and mop around.
• Listen to your favourite music or the radio and dance around the house.
• Play actively with your children.
• Walk the dog more often, or make your usual walk 10 minutes or so longer.
• Get stuck into your garden. Mow, rake leaves and get some planting done.
• Incorporate a few more physical activities into your family’s leisure time; for example, you could take the children to the park or kick a ball around the backyard.

Out and about
Suggestions include:
• Ignore the lifts in favour of the stairs.
• In shopping centres, take the stairs instead of the escalators.
• Walk up the escalators instead of just riding them.

Things to remember
• Everyday activities, such as housework and gardening, can help burn kilojoules.
• Research suggests that maintaining an active lifestyle is the key to good health and weight management.
Unit 5
Fish
Australia’s leading health research body, the National Health and Medical Research Council (NHMRC), suggests that Australians should eat more fish. This is because fish is low in fat, high in protein and an excellent source of omega 3 fatty acids. Researchers worldwide have discovered that eating fish regularly – one or two serves weekly – may reduce the risk of diseases ranging from childhood asthma to prostate cancer. Healthy ways to enjoy fish include baked, poached, grilled and steamed.

Health benefits of eating fish
Regular consumption of fish can reduce the risk of various diseases and disorders. Selected research findings include

• **Asthma** – children who eat fish may be less likely to develop asthma.
• **Brain and eyes** – fish rich in omega 3 fatty acids can contribute to the health of brain tissue and the retina (the back of the eye).
• **Cardiovascular disease** – eating fish every week reduces the risk of heart disease and stroke by reducing blood clots and inflammation, improving blood vessel elasticity, lowering blood pressure, lowering blood fats and boosting ‘good’ cholesterol.
• **Dementia** – elderly people who eat fish or seafood at least once a week may have a lower risk of developing dementia, including Alzheimer’s disease.
• **Depression** – people who regularly eat fish have a lower incidence of depression (depression is linked to low levels of omega 3 fatty acids in the brain).
• **Diabetes** – fish may help people with diabetes manage their blood sugar levels.
• **Eyesight** – breastfed babies of mothers who eat fish have better eyesight, perhaps due to the omega 3 fatty acids transmitted in breast milk.
• **Inflammatory conditions** – regular fish consumption may relieve the symptoms of rheumatoid arthritis, psoriasis and autoimmune disease. • **Prematurity** – eating fish during pregnancy may help reduce the risk of delivering a premature baby.

Foods rich in omega 3 fatty acids
The recommended daily amount of omega 3 fatty acids from fish is 200–600mg and from plants it is 1–2g. The following are approximate amounts of omega 3 fatty acids per 60g serve of varieties of fish:

• Salmon (fresh Atlantic) 1,200mg
• Smoked salmon 1,000mg
• Canned salmon 500mg
• Sardines 1,500mg
• Trout (fresh rainbow) 350mg
• Gemfish 300mg
• Blue-eye, shark (flake), salmon, squid 250mg
• Scallop or calamari 200mg
• Sea mullet, abalone 170mg
• Canned tuna 145mg
• Orange roughy or sea perch 7mg.
The following are approximate amounts of omega 3 fatty acids per 60g serve of other foods:
• Two slices of fish oil enriched white bread 27mg
• Lean beef or lamb 40mg
• One fish oil enriched egg 200mg
• Fish oil enriched margarine (10g) 60mg
• One regular egg 40mg.
The best source of omega 3 fatty acids is fish, rather than fish oil capsules.

Fish oil reduces risk of heart disease
Hundreds of studies have been done on fish or fish oils and their role in the prevention or treatment of heart disease. A review in the British Medical Journal recommends fish or fish oil supplements to prevent heart attacks, particularly in people with vascular disease. How omega-3 fats reduce heart disease is not known, but they are known to lower blood triglycerides and blood pressure, prevent clotting, are anti-inflammatory and reduce abnormal heart rhythms.

A word of caution on mercury
While it is recommended to eat one to two fish meals a week, it is wise to avoid fish high in mercury. Excess mercury appears to affect the nervous system, causing: numb or tingling fingers, lips and toes; developmental delays in walking and talking in children; muscle and joint pain; increased risk of heart attack.
Fish high in mercury include shark, swordfish (broadbill) and marlin, ray, gemfish, ling, orange roughy (sea perch) and southern blue fin tuna. Pregnant women, nursing mothers, women planning pregnancy and children up to six years old should avoid these fish. If catching and eating your own fish, don’t fish in polluted waters. Bottom feeder species, such as catfish, may ingest more pollutants.

Types of fish cuts
The types of fish cuts available include:
• Fillet – the boneless flank of the fish.
• Dressed – with head and fins (entrails, scales and gills are removed).
• Steak – cross-sections taken from a dressed fish.
• Gutted – whole fish with entrails removed.

Healthy ways to cook fish
Healthy ways to cook fish include:
• Baking – make shallow cuts along the top of the fish. Put into a greased dish and cover with foil. Flavour with herbs, lemon juice and olive oil. Bake at around 180°C and baste frequently.
• Shallow frying – dry and flour the fish. Place a small amount of oil or butter in the pan. Fry the fish at a medium heat.
• Grilling – cut slashes into whole fish to help the heat penetrate the flesh. Place fish on a preheated grill. Baste frequently.
• Poaching – not suitable for flaky varieties. Place fish in gently simmering stock. Whole fish should be placed in a pan of cold stock, which is then slowly brought up to a gentle simmer.
• Steaming – put fish in a steamer or on a plate over a saucepan containing gently boiling water. Cover.

Cooking times for fresh fish
To estimate the cooking time of a fresh piece of fish, measure the meat at its thickest part. Suggested cooking times include:
• **One cm thick** – bake for 3 minutes, shallow fry for 4 minutes, grill for 5 minutes, poach for 8 minutes, steam for 3 minutes.
• **Two cm thick** – bake for 11 minutes, shallow fry for 7 minutes, grill for 6 minutes, poach for 10 minutes, steam for 7 minutes.
• **Three cm thick** – bake for 15 minutes, shallow fry for 10 minutes, grill for 9 minutes, poach for 12 minutes, steam for 11 minutes.
• **Four cm thick** – bake for 20 minutes, shallow fry for 13 minutes, grill for 11 minutes, poach for 13 minutes, steam for 14 minutes.

**Cooking times for frozen fish**
To estimate the cooking time of a frozen piece of fish, measure the meat at its thickest part. Suggested cooking times include:
• **One cm thick** – bake for 17 minutes, shallow fry for 7 minutes, grill for 12 minutes, poach for 10 minutes, steam for 5 minutes.
• **Two cm thick** – bake for 22 minutes, shallow fry for 11 minutes, grill for 15 minutes, poach for 15 minutes, steam for 11 minutes.
• **Three cm thick** – bake for 35 minutes, shallow fry for 15 minutes, grill for 24 minutes, poach for 22 minutes, steam for 13 minutes.
• **Four cm thick** – bake for 39 minutes, shallow fry for 18 minutes, grill for 28 minutes, poach for 28 minutes, steam for 16 minutes.

**Sustainable fish shopping**
All fishing has some impact, but some fish choices are far better than others. Some fish types may be overfished, associated with by-catch of birds or mammals (long lines used to catch swordfish also snare turtles, sharks, dolphins and seabirds), or may be killed in the process of commercial fishing for other species.

**Things to remember**
• Eating one or two serves of fish weekly can reduce the risk of a range of diseases, from childhood asthma to prostate cancer.
• Healthy ways to enjoy fish include baked, poached, grilled and steamed.
• Avoid fish high in mercury such as shark, swordfish (broadbill) and marlin.
• Pregnant women, women planning pregnancy and children up to six years of age should choose the fish they eat carefully.
Unit 6
Liver explained
The liver is situated on the upper right side of the abdomen, just below the diaphragm. It is the largest internal organ of the human body and weighs around 1.5kg in the average adult. Blood from the digestive system must first filter through the liver before it travels anywhere else in the body. The principal roles of the liver include removing toxins from the body, processing food nutrients and helping to regulate body metabolism. A range of conditions can prevent the liver from performing its vital functions. Culprits include fat accumulation, alcohol misuse, viral infection, iron or copper accumulation, toxic damage and cancer. The most common cause of liver disease is non-alcoholic fatty liver disease (‘fatty liver’). Cirrhosis is the end-result of many liver conditions and involves severe scarring of the liver (with liver nodule formation). It is associated with a progressive decline in liver function resulting in liver failure.

Functions of the liver
Some of the many functions of the liver include:

• Drugs, including alcohol, are filtered through the liver and neutralised or converted into other forms by special enzymes.
• Bile, produced by the liver, is stored in the gall bladder and used to help break down dietary fats.
• Fat soluble vitamins A, D, E and K need bile in order to be absorbed by the body.
• The liver converts carbohydrates into glucose for instantly available energy and converts glucose into its storable form (glycogen). When blood sugar levels drop, glycogen is converted back into glucose.
• Amino acids from protein are sent to the liver for the production of body proteins such as hormones.
• The liver changes ammonia (a toxic by-product of protein metabolism) into urea, which is then excreted in urine.

Symptoms of disease Symptoms of liver disease depend on the disorder, but can include:
• Jaundice (the skin or whites of the eye turn yellow)
• Dark urine
• Nausea
• Vomiting
• Diarrhoea
• Appetite loss
• Weight loss
• General malaise
• Fever
• Bloated abdomen, swollen ankles
• Abdominal pain in the upper right side
• Anaemia, vomiting blood or passing black stools (denoting altered blood)
• Changes in mental state – altered sleep pattern (awake at night), confusion, drowsiness.

A range of causes
Some of the causes of liver disease include:
• Non-alcoholic fatty liver disease (‘fatty liver’)
• Hepatitis virus infections
• Alcohol-related liver disease
• Toxic effect of medications, herbal medicines
• Congenital or inherited abnormalities of the liver – involving accumulation of iron and copper in the body and some rare enzyme disorders
• Conditions leading to liver cell and/or bile duct (‘the plumbing system’ of the liver) damage.

A range of disorders
Some disorders of the liver include:

• **Fatty liver** – this is the most common of the alcohol-induced liver disorders. Fat accumulates inside the liver cells, causing cell enlargement (steatosis) and sometimes cell damage (steatohepatitis), and can lead to cirrhosis. Similar changes are also seen in people who do not drink excessive amounts of alcohol but are overweight, obese or have diabetes. The liver becomes enlarged, causing discomfort on the upper right side of the abdomen.

• **Cirrhosis** – this has many causes but is commonly due to hepatitis infection or excessive alcohol intake. The cells of the liver are progressively replaced by scar tissue, which seriously impairs liver functioning.

• **Hepatitis** – a general term meaning inflammation of the liver. It is also used to refer to infections of the liver by specific viruses (hepatitis A to E).

• **Haemochromatosis** – this inherited disease makes the body absorb and store higher than normal amounts of iron. This damages many organs including the liver, pancreas and heart.

• **Autoimmune liver disorders** – an abnormal increase in immune cells damages the liver cells. These rare conditions include autoimmune hepatitis and primary biliary cirrhosis (mostly women affected) and primary sclerosing cholangitis (more common in men).

• **Cancer** – primary cancers can arise in the liver, most often from chronic hepatitis with cirrhosis. Stray cancer cells from a tumour elsewhere in the body may cause a secondary tumour in the liver.

• **Galactosaemia** – the body’s reaction to particular milk sugars damages the liver and other organs. This is a rare inherited disorder.

• **Alpha 1-antitrypsin deficiency** – another rare inherited disorder that can cause cirrhosis of the liver.

• **Wilson’s disease** – the liver can’t excrete copper. Various organs of the body, including the liver and brain, are affected by the excessively high copper levels.

Complications of liver disease
Without treatment, a person with liver disease is susceptible to a wide range of complications, including:

• **Hepatic encephalopathy** – scar tissue prevents the proper flow of blood through the liver, so that toxins remain. These circulating toxins, particularly ammonia, affect brain functioning and can lead to a coma.

• **Ascites** – liver disease can cause a build-up of body sodium (‘salt’), which leads to fluid retention in the abdominal cavity (ascites) and in the legs, feet and back (oedema).

• **Liver failure** – the liver cells are destroyed faster than the liver can replace them, until the organ can no longer function adequately.

• **Cancer** – cirrhosis or some forms of hepatitis can make the liver more susceptible to primary cancer (cancer that originates in the liver).

• **Gastrointestinal bleeding** – the veins that normally travel through the liver may be blocked because of cirrhosis. These veins then bypass the liver and may travel along the stomach or oesophagus lining, where they may rupture and bleed.
Diagnosis
Liver disease is diagnosed using a number of tests, including:

- **Physical examination** – the liver may be enlarged.
- **Medical history** – including medications and lifestyle factors such as diet and alcohol consumption, exposure to hepatitis viral infections, blood transfusions, tattoos or family history of liver disease.
- **Blood tests** – to check the levels of liver enzymes and jaundice (‘yellowness’) and to assess the protein production capability of the liver.
- **Ultrasound scan of the abdomen (‘belly’)** – a three-dimensional ‘x-ray’ using sound waves. This is used to look at the liver and other organs, including check their size and shape, check the liver for abnormal lumps and assess fluid accumulation.
- **Other scans** – including computerised tomography (CT) scan and magnetic resonance imaging (MRI).
- **Biopsy** – a small piece of liver tissue is removed and examined under the microscope in a laboratory.

Treatment
Treatment depends on the cause, but may include:

- Rest
- Avoiding alcohol and any drugs that might damage the liver
- A well-balanced, nutritious diet – some people require a modified diet (for example, low salt)
- Medications, such as antiviral drugs to treat viral infections
- Specific medications to manage Wilson’s disease
- Periodic removal of blood to bring iron levels down to normal (in patients with haemochromatosis)
- Surgery, chemotherapy and radiotherapy, or liver transplantation are the usual treatments for liver cancer
- In cases where the liver is failing, a liver transplant is an option.

Things to remember
• The principal roles of the liver include removing toxins, processing food nutrients and regulating body metabolism.
• Important causes of liver disorders are fatty liver, hepatitis virus infections and alcohol.
• Cirrhosis (liver scarring), the end-result of many liver disorders, can lead to liver failure.
Unit 7
Overweight children - healthy lifestyle tips
The number of overweight children and adults is increasing. About one quarter of children in Australia are now overweight. Encouraging children to eat healthy food and be physically active can be a challenge. It requires patience, practice and time. Childhood is an important time to develop healthy patterns for life and prevent weight problems. Research shows that overweight children are more likely to become overweight adults.

Seek advice if you’re not sure
Sometimes it is hard to tell if a child is overweight. This is because children have different shapes at different ages. When there are more overweight children around, our view of what is ‘normal’ may also change. Your family doctor, school nurse or an experienced health professional will be able to check your child’s growth.

Why children become overweight
A diet high in energy and fat combined with little physical activity or exercise will lead to someone becoming overweight. Your family’s eating habits and activity patterns will affect body weight. You also inherit body type and shape from your parents.

Possible problems for overweight children
Overweight children can have difficulties in several ways. Most often they may feel different from other children, which can affect their confidence. They can also be subjected to bullying from other children. This may make parents feel worried about children taking part in everyday activity such as school sports. Unfortunately, this can make weight control more difficult.
Although health problems are less common in childhood, children who continue to be overweight into adulthood can develop:

• High blood fats with the risk of heart disease
• Type 2 diabetes
• High blood pressure
• Stroke
• Joint problems
• Breathing problems
• Some forms of cancer.
Overweight caused by medical conditions is rare, but always check with your doctor if you are concerned.

How to help your overweight child
If your child is overweight, the advice of a health professional is important. Young children should not be on restrictive diets that severely limit food intake. You need to make permanent changes to your family’s lifestyle and eating habits. Everyone at home should be involved in any changes, regardless of body weight, so that no child feels singled out. Making the right changes will protect your children from developing eating and dieting problems later in life. It may take a number of attempts before children are happy to change their food choices or become more active. This may be frustrating for parents. But don’t give up. Remember to stay positive. Children who are overweight need to know that they are loved and important, regardless of their weight.
How to make healthy food choices
A healthy diet is not only what your child eats, but how much. All children should eat regularly, including healthy snacks. Good nutrition starts early in life. Wherever possible try to:
• Breastfeed and introduce solids at around six months.
• Encourage a wide variety of nutritious foods. No particular food should be forced or overly restricted.
• Consider using reduced fat dairy products after two years of age.
• Offer mostly cereals, grains and breads, vegetables and fruits, with moderate amounts of meat products and dairy foods.
• Limit added fats such as oil, margarine and butter.
• Offer fresh vegetables and fruit instead of processed snack foods.
• Include treats such as cakes, chips or takeaway foods occasionally (once or twice per week). Enjoy them as a family.
• Offer children water when they are thirsty. Sweet drinks including juices, cordial and fizzy drinks are not necessary and can contribute to tooth decay.

Ways to encourage healthy changes to your child’s eating
Suggestions include:
• Buy, prepare and offer the foods you would like your child to eat. Allow them to choose what and how much of these foods they will eat.
• Keep offering healthy foods even if they refuse them at first.
• Include your child’s food choices in the family menu sometimes.
• Involve children in simple food preparation, for example, making a salad.
• Let your child decide if they have had enough, even if food is left on their plate. This encourages children to better understand feelings of hunger and fullness. These habits may help to control appetite and prevent overeating as they grow.
• Encourage slow eating if yours is a family of fast eaters. Put your knife and fork down between mouthfuls. Offer crunchy foods that need chewing.
• Help your child recognise if he or she eats when bored, sad or lonely. Try to suggest another activity to help distract them.
• Try not to punish, reward or cheer your child up with food. It can be tempting to use food this way at times but it establishes an unhealthy relationship with food.

Fun family activity
An active lifestyle is important for the whole family, regardless of their age or weight. Physical activity helps to build skills, makes you feel better and helps to protect you from many lifestyle diseases. Activity should be fun, without focusing only on competition or skills. To keep children active as they get older, they may need help from their parents to include physical activity in the family routine.

Tips to increase everyday activity at home
Suggestions include:
• Be active together. Let your child see you being active too.
• Encourage lots of free playtime outside.
• Try to use the car less. Walk or cycle to school, the shops or to a friends house.
• Help your child find a balance between organised sport, fun activities and individual sports like swimming and dancing.
• Find an activity that your child enjoys and that is fun, readily available, affordable and
matches your child’s age and skill level. Ask your child’s physical education teacher,
childcare worker, community centre or other parents about options.
• Be supportive and encouraging. Some children feel embarrassed and uncomfortable about
their physical skills or appearance.
• Motivate your children to be active – even though it’s not always easy. Remember, if your
child gets hot, puffed and sweaty when active, this is generally a good sign that they are
working their bodies and getting some benefit from the exercise.

Television and screen viewing
Watching too much television is linked closely with overweight in children. When children
watch TV, they are not being active and are more likely to see food advertisements that
encourage them to eat whether they are hungry or not.
Suggestions include:
• Limit sedentary activity like TV watching, watching videos, playing personal screen games
and using computers to no more than two hours a day.
• Avoid eating while the TV is on. This may be a distraction from family time together.

Getting started
Start slowly. It is best to manage one or two small changes before moving on to the next
change. It doesn’t matter how long this takes. Find out what works for your family. Small
setbacks may happen, but try to be patient and reward your child’s effort and progress with
treats like books, stickers or special outings.

Things to remember
• Involve the whole family in healthy eating and activity.
• Encourage active play and sport.
• Limit sedentary activities such as TV, screen games and computers to no more than two
hours a day.
Unit 8

Pain management

The main causes of pain include medical conditions (such as cancer, arthritis and back problems), injuries and surgery. Sometimes, the cause of the pain can't be found or there are no available treatments for it. In other cases, the cause may be remedied, but the associated pain lingers on. Chronic pain is defined as pain that persists for longer than three months. At any given time, around one third of Australians are in pain. Management strategies include pain-killing medications, and complementary therapies (such as acupuncture and massage). Studies suggest that a person's outlook and the way they emotionally cope with chronic pain influence their quality of life. It has been shown that people who learn self-management skills lower their levels of felt pain. It is important to learn these skills, and to deal with the associated stress and depression in constructive ways.

The epidemiology of pain

A Brisbane study in 1986 found that certain groups are more likely to suffer chronic pain than others. The findings of this study were similar to research findings from other countries. Selected statistics include:

- The incidence of pain rises with advancing age.
- Women are more likely to be in pain than men.
- The most commonly reported pain is back pain.
- The most severe pains include those of the back, head, neck and leg.
- The pain is constant for around one fifth of people.
- The cause is unknown in around one third of cases.
- One fifth of cases were caused by work-related accidents.
- Most people surveyed had suffered chronic pain for longer than three years.
- Seven out of 10 people sought professional help.
- The most common source of professional help was the family doctor (80 per cent).

Pain-killing medications

The type of medication you are prescribed depends on your pain. The issues you need to discuss with your health care professional include: the location, intensity and type of pain; which activities ease or exacerbate it; the impact your pain has on lifestyle factors, such as appetite and quality of sleep. Medications for chronic pain are best taken regularly. If your pain is well managed, you are less likely to take large doses of painkillers, and the risk of side effects is reduced.

The medications available for the management of chronic pain include:

- Aspirin and aspirin-like drugs
- Paracetamol
- Opioid drugs, such as codeine and morphine
- Local anaesthetics.

Long term use of some medications can have side effects which affect a person's quality of life. They may also lose their ability to reduce pain. Some studies have shown that medication can undermine the value of developing self-management skills. This occurs because the person believes they are coping better with pain due to the medication, not because they may have learnt effective coping skills.
Complementary therapies
Numerous studies have found that certain complementary therapies are effective in pain management. Some of these therapies include:

- **Acupuncture** - a component of traditional Chinese medicine. Acupuncture involves the insertion of slender needles into specific points on the skin.
- **Massage** - better suited to soft tissue injuries and should be avoided if the pain originates in the joints.
- **Relaxation techniques** - including meditation and yoga.
- **Transcutaneous electrical nerve stimulation (TENS) therapy** - a minute electrical current is passed through the skin via electrodes, prompting a pain-killing response from the body.
- **Cognitive-behavioural therapy** - this is a process of learning to change how you think and, in turn, how you feel and behave about pain. It is part of a process of self-management of chronic pain.

Coming to terms with chronic pain
Sometimes, chronic pain cannot be relieved. Suggestions on how to emotionally handle this difficult and distressing situation include the following:
- If all medical avenues have been exhausted, don't raise false hopes by searching fruitlessly for a cure.
- Accept that your pain may not go away and that flare-ups may occur. Talk yourself through these times.
- Find out as much as you can about your condition so that you don't fret or worry unnecessarily about the pain. Fear makes cowards of us all!
- Take steps to prevent or ease depression by any means that work for you, including talking to friends or professionals.
- If painkillers can't ease the pain, don't increase the dose - take fewer or none at all, in consultation with your doctor.
- Improve your physical fitness, eat healthy foods and ensure you get all the rest you need.
- Don't allow the pain to curtail your life more than necessary - if you miss activities you used to do before the pain, try reintroducing those activities in a gently paced way. You may need to cut back on these activities if pain flare-ups occur, but it will be possible to increase slowly again as you did before.
- Concentrate your efforts on finding fun and rewarding activities that don't exacerbate your pain.
- Seek advice on new coping strategies and skills from an occupational therapist.

Things to remember
- At any given time, around one third of Australians are in pain.
- Management strategies for chronic pain include pain-killing medications, and complementary therapies (such as acupuncture and massage).
- Studies suggest that a person's quality of life is influenced by their outlook, and by the way they emotionally cope with chronic pain.
- Seek advice on new coping strategies and skills from an occupational therapist.
**Unit 9**

**Passive smoking**
Passive smoking means breathing in other people’s tobacco smoke. A smoker’s exhaled smoke is called exhaled mainstream smoke. The smoke drifting from their lit cigarette is called sidestream smoke. The combination of mainstream and sidestream smoke is called environmental tobacco smoke (ETS).

Most of the smoke that hangs in a room is sidestream smoke, which contains higher levels of cancer causing compounds than mainstream smoke. ETS is a common indoor pollutant. The fact that Australians spend about 90 per cent of their time indoors (on average) makes passive smoking a serious health hazard for both smokers and non-smokers. Children are particularly at risk of adverse health effects from passive smoking. Workers in the hospitality industry are also at risk if they work in pubs and other enclosed spaces where patrons smoke.

**Irritant effects**
Tobacco smoke inside a room tends to hang in mid-air rather than disperse. Hot smoke rises, but tobacco smoke cools rapidly, which stops its upward climb. Since the smoke is heavier than the air, the smoke starts to descend. A heavy smoker who smokes indoors causes a permanent low-lying smoke cloud that other householders have no choice but to breathe. Tobacco smoke contains around 4,000 chemicals, made up of particles and gases, about 60 of which are known to cause cancer. In 1992, the United States Environmental Protection Authority classified environmental tobacco smoke as a Group A carcinogen – one that causes lung cancer in humans. Compounds such as ammonia, sulphur and formaldehyde irritate the eyes, nose, throat and lungs. These compounds are especially harmful to people with respiratory conditions such as bronchitis or asthma. Exposure to environmental tobacco smoke can either trigger or worsen symptoms.

**Health risks – unborn babies**
Australian data indicates that about 20 per cent of women smoke during pregnancy, although this percentage appears to be going down. Both smoking and passive smoking can seriously affect the developing foetus. Health risks for mothers who smoke during pregnancy include:

- Increased risk of miscarriage and stillbirth
- Increased risk of premature birth and low birth weight
- Increased risk of sudden infant death syndrome (SIDS)
- Increased risk of complications during the birth.

A non-smoking pregnant woman is more likely to give birth to a baby with a slightly lower birth weight if she is exposed to environmental tobacco smoke in the home – for example, if her partner smokes.

**Health risks – children**
Children are especially vulnerable to the damaging effects of environmental tobacco smoke. Some of the many health risks include:

- Passive smoking is a risk factor in sudden infant death syndrome (SIDS or cot death).
- A child who lives in a smoking household for the first 18 months of its life has an increased risk (around 60 per cent higher) of developing a range of respiratory illnesses including croup, bronchitis, bronchiolitis and pneumonia. They are also more prone to getting colds, coughs and glue ear (middle ear infections). Their lungs show a reduced ability to function and slower growth.
• A child exposed to environmental tobacco smoke in the home is 40 per cent more likely to
develop asthma symptoms. Estimates suggest that about eight per cent of childhood asthma
cases are caused by passive smoking.

Health risks – partners who have never smoked
People who have never smoked but who live with partners who smoke are at increased risk of
a range of tobacco-related diseases.
Some of the many health risks for partners who have never smoked include:

• Passive smoking increases the risk of heart disease. There is consistent evidence that
nonsmokers married to smokers have higher risks of coronary heart disease than those whose
spouses do not smoke.
• Tobacco smoke makes the blood more ‘sticky’ and likely to clot. There is evidence that
levels of the ‘good’ or protective blood cholesterol (called high density lipoprotein or HDL)
are also reduced.
• Long term exposure to passive smoking may lead to the development of atherosclerosis
(narrowing of the arteries). Just 30 minutes of exposure to environmental tobacco smoke can
start this process.
• Non-smokers who suffer long term exposure to environmental tobacco smoke have a 20 to
30 per cent higher risk of developing lung cancer than non-smokers who are not exposed
to passive smoke.
• The National Health and Medical Research Council (NHMRC) has estimated that 11 people
who have never smoked die from lung cancer each year in Australia, and up to 77 people
die from coronary heart disease, because they are exposed to smoke at home.
• There is increasing evidence that passive smoking can increase the risk of stroke among
non-smokers.
• There is an increased risk of nose and sinus cancer.

Quit smoking as soon as you can
The risks of active smoking are well known. If a smoker can’t give up for their own health,
the health of their partner or children could be a stronger motivation. There is a wealth of
assistance for smokers who wish to stop smoking. See your doctor for further information
and advice, or ring the Quitline on 137 848.

Reducing the risk of passive smoking
If the smoker is unwilling or unable to stop right now, there are various ways to help protect
the health of their partner and children. Suggestions include:
• Make your home smoke-free. Some smokers think that limiting their smoking to one or two
rooms is an effective measure, but tobacco smoke easily drifts through the rest of the house.
• Make sure that smokers who visit the house smoke their cigarettes outdoors, no matter what
the weather. If they object or take offence, try calmly explaining the health risks of passive
smoking, and point out that you simply want to protect the health of your family.
• Make your car smoke-free. The other occupants will still be exposed to tobacco smoke even
if the windows are open.
• Don’t allow smoking in any enclosed space where your partner or children spend time – for
example inside the garage, shed, cubby house, boat or caravan.
• Don’t take your children to smoky venues. If you do visit a smoky venue, always choose the
non-smoking seating area (if there is an option).
• Make sure that all people who look after your children (for example, grandparents or
babysitters) provide a smoke-free environment.
Things to remember
• If a smoker can’t give up for their own health, perhaps the health of their partner or children will be a stronger motivation.
• Passive smoking increases the risk of respiratory illnesses in children, including asthma, bronchitis and pneumonia.
• People who have never smoked who live with smoking partners are at increased risk of a range of tobacco-related diseases including lung cancer, heart disease and stroke.
Unit 10

Personal hygiene
One of the most effective ways we have to protect ourselves and others from illness is good personal hygiene. This means washing your hands, especially, but also your body. It means being careful not to cough or sneeze on others, cleaning things that you touch if you are unwell, putting items such as tissues (that may have germs) into a bin, and using protection (like gloves or condoms) when you might be at risk of catching an infection. Personal hygiene, such as bathing, is very much dependent on the culture in which you live. In some cultures, it is expected that you will wash your body at least every day and use deodorants to stop body smells. Other cultures have different expectations.

Body odour
Body smells are caused by a number of factors working in combination, including:
• Chemicals in sweat, including pheromones, which are made by the body and sexually attract (or repel) other people.
• Wastes excreted through the skin, such as metabolised alcohol.
• The actions of bacteria that live on the skin and feed on dead skin cells and sweat.
• Unwashed clothes, such as underwear and socks.

Hand washing
Most infections, especially colds and gastroenteritis, are caught when we put our unwashed hands, which have germs on them, to our mouth. Some infections are caught when other people’s dirty hands touch the food we eat. Hands and wrists should be washed with clean soap and water, using a brush if your fingernails are dirty. Dry your hands with something clean, such as paper towels or hot air dryers. You should always wash your hands:
• After using the toilet
• Before making or eating food
• After handling dogs or other animals
• If you have been around someone who is coughing or has a cold.

Personal hygiene for women
The vagina is able to clean itself no special care is needed, other than washing the external genitals. Do not put anything like douches into the vagina, as the delicate skin can be damaged.
Here are some personal hygiene suggestions for women:
• Menstruation - wash your body, including your genital area, in the same way as you always do. Change tampons and sanitary napkins regularly, at least four to five times a day. Always wash your hands before and after handling a tampon or pad.
• Cystitis - is an infection of the bladder. This is a common condition for sexually active young women. Urinating after sexual intercourse can help to flush out any bacteria that may be in the urethra and bladder.
• Thrush - some soaps and detergents can irritate the skin of the vagina, and make thrush infections more likely. Some people find that they often get thrush when they use antibiotics. Use mild soap and unperfumed toilet paper. Avoid tight, synthetic underwear. Try cotton underwear, and change regularly. There is medical treatment for thrush, so talk to your doctor or pharmacist.
Personal hygiene for men
A build-up of secretions called smegma can form under the foreskin of uncircumcised men. If you are uncircumcised, gently pull back the foreskin when you have a shower and clean with water. You can use soap if you like, but make sure you rinse it off well.

Bad breath
Good dental hygiene includes regular brushing and flossing. Bad breath can be caused by diseases of the teeth, gums and mouth, such as infections. Most people have bad breath first thing in the morning because saliva is not made while you’re asleep. Some foods that can cause bad breath include garlic and onion. Mouth washes, mouth sprays and flavoured chewing gum can make your breath smell better for a while, but if you have a health problem in your mouth, you need to see your dentist.

Travelling hygiene
When travelling overseas, take special care if you’re not sure whether the water is safe. Suggestions include:
• Drink only bottled water.
• Don’t use tap water to clean your teeth.
• When you wash your hands, make sure they are totally dry before you touch any food.
• Don’t wash fruit or vegetables in unsafe water.
• If you have no other water source, make sure the water is boiled before you drink it by holding it at a rolling boil for one minute.
• Make sure any dishes, cups or other utensils are totally dry after they are washed.

Things to remember
• Good personal hygiene is one of the most effective ways to protect ourselves and others from many illnesses, such as gastroenteritis.
• Wash your hands regularly, especially before preparing or eating food and after going to the toilet.
unit 11

Pesticides - safety when you use a pest control service
Sometimes you might have pest problems that will be too difficult to manage yourself. For these jobs, you should hire a professional pest control operator, who may suggest the use of a pesticide.

Pesticides are used to control pests
Pesticides are substances used to manage pests. They include insecticides used for insect control, herbicides used for weed control, and rodenticides used to kill rats and mice. Pesticides are toxic. They need to be used with great care. If they are used carelessly they may damage the health of the person applying them or the health of other people in the community. They may also damage the environment.

Laws control use of pesticides
There are laws to control the use of pesticides. There are also certain precautions that you should try to take to minimise your exposure to these substances when you use a commercial pest control service.

How pesticides can affect your health
Pesticides can take the form of a solid, liquid, powder or spray. The form will influence the way in which the pesticide can enter your body and potentially affect your health. Pesticides can enter your body if you:
• Swallow pesticide; eat, drink or smoke after handling pesticide; or consume food or drink that was exposed to pesticide.
• Have skin contact with pesticide – directly, through pesticide-soaked clothing, or by touching pesticide-treated surfaces.
• Inhale pesticide vapours, sprays or dust.
• Rub your eye after handling pesticide or in some other way cause pesticide to come into direct contact with your eyes.
If you minimise your exposure and take care when you come into contact with pesticides, you will reduce the chance of damaging your health.

Pesticide poisoning
Poisoning as a result of exposure to pesticides may occur shortly after a single exposure (acute poisoning) or gradually after repeated exposures over a period of time (chronic poisoning).

Acute poisoning
Symptoms may begin shortly after exposure and may include:
• Headache
• Dizziness
• Nausea
• Vomiting
• Stomach cramps
• Diarrhoea
• Blurred vision
• Excessive eye watering
• Sweating
• Excess saliva.
More severe poisoning may also lead to changes in heart rate, chest tightness, muscle weakness and twitching, difficulty breathing and walking, constricted pupils and incontinence. In very severe cases of poisoning, seizures and unconsciousness may occur.

**Chronic poisoning**
Symptoms may occur gradually after repeated exposures over a period of time and may include:
- Muscle weakness
- Fatigue
- Difficulty concentrating and remembering things
- Generally feeling unwell.

**Symptoms may vary**
The type of symptoms you may have, how long they last and how severe they are may vary, depending on factors such as:
- The type and concentration of the pesticide used
- The degree of exposure
- The health and age of the person exposed.

**Symptoms may be due to other conditions**
Many of the potential symptoms are not specific to pesticide poisoning – they may be due to other conditions, such as illness or allergy.

**Some people are more likely to be affected**
Although anyone may be affected by exposure to pesticides, certain groups are particularly susceptible including:
- Unborn babies and young children
- Pregnant and nursing women
- Elderly people.

**Poisoning – first aid**
If you or anyone in your family develops symptoms soon after exposure to pesticides:
- Contact a doctor immediately
- Call the Poisons Information Centre on 131 126.
Remember to provide details of the exposure, including the product name if possible.

**Safety precautions**
If you use a commercial pest control operator:
- Use only a licensed pest control operator.
- Obtain the full chemical name of the pesticide to be used – in case of an emergency, this will assist with first aid.
- Ensure food, clothes, toys, toothbrushes, bedding, towels, vegetable gardens, barbecues, pet bowls, fish ponds, clotheslines and cooking utensils are covered or removed from the area to be treated.
- Relocate pets during treatment until the pesticide is dry.
- Ensure that all doors and windows are closed if the pesticide is to be applied outdoors.
- Vacate the premises while the pesticide is mixed and applied, and until the pesticide is dry. Four to six hours is generally recommended but your pest control operator will recommend the appropriate time, based on the specific treatment used.
• Ensure that all benchtops and kitchen utensils are thoroughly cleaned before any food is prepared. Ventilate the house, by opening all doors and windows, for a few hours when you return if the pesticide has been applied indoors.
• Advise your neighbours in advance of any external pesticide treatments. Pest control operators take extra precautions, such as wearing protective clothing, because they are around pesticides all the time and are at greater risk of exposure.

**Talk to the operator about any concerns**
Raise any concerns, such as how the pesticide could affect pregnancy, young children or allergies, with your pest control operator before they start work. This will give them a chance to discuss treatment options with you. A good pest control operator will listen to your concerns and address them by using the most appropriate pest control method.

**Pest control licensing**
Due to the potential risks involved in handling pesticides, anyone who uses pesticides as part of a pest control business in Victoria is required to hold a *Licence to Use Pesticides* issued by the Department of Human Services Victoria. Although pesticides are toxic and there are risks associated with pesticide use, licensed pest control operators are trained in the safe handling, storage and application of these substances. If the appropriate precautions are taken to minimise exposure to pesticides, the risk to health is greatly reduced.

**Things to remember**
• Use only a licensed pest control operator.
• Ensure safety precautions are taken in order to minimise exposure to pesticides.
• If you or your family develop symptoms soon after exposure to pesticides, seek urgent medical attention.
Unit 12

Physical activity - staying motivated
If you have managed to make that significant shift in behaviour to start a physical activity program – the next most crucial thing is to make it habitual. You need to pick an activity that appeals to you, suits your budget and lifestyle, and doesn’t involve a lot of travel. Finding someone to exercise with you, or support you in some other way, can be a good way to help you stay motivated. Remember, always consult with your doctor before beginning any new exercise program, particularly if you are overweight, over 40 years of age, haven’t exercised in a long time or have a chronic medical condition.

Start off right
Suggestions include:

• Pick an activity (or range of activities) that appeal to you. Also choose activities that you are confident of managing physically. For example, if you don’t like jogging or have previously failed at sustaining a jogging program, chances are you won’t keep it up. Remember that enjoyment and confidence are very important to help you maintain physical activity in the long term. Choose an activity that suits your lifestyle. For example, opting for expensive sports like golf or waterskiing may not be sustainable if your income doesn’t stretch that far.
• Choose an activity that you can perform close to home or work. If you have to drive for an hour or more in order to exercise, you may find yourself skipping sessions.
• Set realistic goals. For example, you might decide to aim for four activity sessions per week rather than aiming for a set amount of weight loss. Otherwise, you may be disappointed and discouraged if a frenzied week of exercise doesn’t result in a 4kg weight loss. Accept that regular exercise is a lifelong commitment, not a short-term binge. If you’re trying to lose weight, a healthy weight loss is between 0.5kg and 1.0kg per week. Remember that, while muscle weighs more than fat, bathroom scales can’t tell the difference.
• Remember also that research indicates you don’t need to lose weight to gain significant health benefits.
• Start small. Aim to just include more general activity into your day, working toward a continuous bout of exercise for about 10 minutes per day at first, and gradually work your way up to 30 minutes or more.
• Make the commitment. Put ‘exercise appointments’ in your diary, at least for the first few weeks until exercise becomes a habit.
• Find a friend or family member to be active with. Motivate and reward each other and enjoy the process together.
• This is obviously important to you or you would not have taken the steps to change your behaviour, so make exercise a priority in your life.

Pinpoint your goals
We all have different motivations to exercise. Think about your personal fitness goals to help you on those days when you don’t feel like lacing up your sneakers. For example, you may exercise to:
• Reduce back pain
• Improve joint mobility
• Sleep better
• Keep up with the kids
• Lose weight
• Feel more energetic
• Manage feelings of depression or anxiety.
Remind yourself of the personal benefits of regular exercise whenever keeping up your routine feels like a drag.

**Don’t think about it too much**
It’s probably best not to think about it too much – just go ahead and do it! Issues to consider include:
• If you think too much about exercising, you may well talk yourself out of it.
• People who exercise regularly don’t bother with positive thinking or pep talks. Try ‘walking the walk’ instead of ‘talking the talk’.
• It may help to consider exercising as an activity like brushing your teeth – don’t consider the pros and cons. Just do it! Book dates in your diary and stick to them.
• When obstacles arise, adapt. For example, if a thunderstorm breaks, ride your stationary bike or exercise to a videotape in your living room instead of going for a walk. Plan ahead for such events by creating a back-up plan or two.

**Monitor your progress**
It’s easier to stick to an exercise routine if you can see the benefits. Suggestions include:
• Keep a training diary. This will help you to spot every little improvement you make.
• Pay attention to the way you feel. Was yesterday’s gardening session easier on your back? Are your jeans looser? Were you able to laugh off an irritating event today? Simply taking the time to recognise these little improvements to your daily quality of life can increase your motivation to exercise.
• Reward yourself whenever you reach a fitness goal – for example, your aim is to walk every night after work and you’ve achieved your goal. Rewards could range from a magazine membership to a manicure. The point is to celebrate your achievements in any way that is meaningful to you.

**Avoid boredom**
Suggestions include:
• Choose from a range of physical activities.
• If you feel bored by an exercise routine, challenge yourself. For example, try to walk a bit faster on your 30-minute walk. Or choose a different route.
• Try something new within your existing routine. For example, if swimming is becoming ‘hohum’, swap to a different stroke.
• Set new fitness goals.
• Find a training partner.
• Choose a new activity that interests you.
• Join a group activity. The enthusiasm of others and the sense of camaraderie can buoy you along.
• Purchase new equipment or a new workout outfit.

**Common pitfalls**
Most of us find it difficult to resume regular exercise following a significant break. Suggestions on how to overcome disruptions to your exercise routine include:

• **Illness** – once you feel a little better, opt for a gentle exercise routine. For example, take a 10-minute stroll around the neighbourhood instead of jogging for an hour, perform isometrics (muscle-tightening exercises) or stretches, or use ‘fitness bands’ to maintain
• **Injury** – you will need to set new goals for the short term. Make recovery, not exercise, your first priority. Ask your doctor or medical specialist about how you can keep fit while recovering. Gentle exercise like walking, stretching or swimming may be possible. Be guided by your doctor.

• **Holiday** – take advantage of local facilities. For example, some hotels have swimming pools, tennis courts or gyms. If you’re holidaying at the beach, take a daily swim. Tour on foot – walking is one of the best ways to see the sights and is a great aerobic and weightbearing exercise.

• **Business commitments** – exercise at your desk. For example, isometric exercises involve rhythmically clenching muscle groups and can be done anywhere. Perform stretches. Take a break from your desk and walk the stairs every now and then.

• **Bad weather** – adapt your routine. Exercise indoors – head to your local swimming pool or gym.

**Be flexible**

Suggestions include:

• Remember that unexpected events will arise from time to time and disrupt your exercise routine. Don’t let this worry you, but make a date in your diary for your next available exercise session.

• Consider getting up 30 minutes earlier to exercise if the rest of your day is packed with events.

• Keep ‘at home’ exercise options accessible – for example, exercise videotapes or a stationary bike.

• Aim to increase the physical activity in your everyday routine – for example, walk instead of drive to the train station, take the stairs instead of the elevator or take a walk at lunchtime.

• Focus on your healthy diet when exercise isn’t possible.

• Appreciate that a short break may be a good thing. Remember, even professional athletes schedule regular periods of ‘down time’. This may be important if you participate in rigorous activities such as weight training.

**Things to remember**

• Always consult with your doctor before starting any new exercise routine, particularly if you are overweight, over 40 years, haven’t exercised in a long time or have a chronic medical condition.

• People who manage to maintain a regular exercise program don’t intellectualise about it – they just go ahead and do it.

Keep a training diary to help you spot every little improvement you make.
Unit 13

Physiotherapy
The central aim of physiotherapy (physical therapy) is to restore proper functioning to the body. In the case of permanent disease or injury, the aim is to reduce the impact of the dysfunction. Contrary to popular belief, physiotherapists aren’t limited to the rehabilitation of sports injuries and back pain. As well as musculoskeletal injuries, physiotherapists can also manage:

- Neurological conditions, such as stroke
- Multiple sclerosis and spinal cord injuries
- Cardiothoracic conditions like emphysema, asthma and chronic bronchitis.

Physiotherapists can help a person to recover from surgery. Treatment options include a wide range of manual therapies, exercise programs and electrotherapy techniques, tailored to your specific condition. Your physiotherapist may work alone, or in collaboration with other health care providers, to offer a multifaceted approach to your rehabilitation. Physiotherapists also work in schools, community health centres, fitness centres and in the workplace.

Three types of physiotherapy
Physiotherapy is an effective form of treatment for a wide range of conditions. It can also help speed recovery after many different types of surgery. Physiotherapists are trained in a range of specialist areas such as paediatrics, sports medicine or women’s health. Generally, the three different types of physiotherapy include:

- **Musculoskeletal** - to treat muscles, bones and joints (also called orthopaedic physiotherapy). Common conditions treated include back pain, sprains, strains, arthritis, bursitis, workplace and sports injuries, problems with posture, incontinence and reduced mobility. Rehabilitation after surgery is also offered.
- **Cardiothoracic** - to treat disorders of the cardio-respiratory system including asthma, emphysema and chronic bronchitis, and to offer rehabilitation after thoracic surgery.
- **Neurological** - to treat disorders of the nervous system including acquired head injuries, stroke, spinal cord injuries, Parkinson’s disease and multiple sclerosis, and to offer rehabilitation after brain surgery.

A holistic approach
A physiotherapist works to improve your mobility and health and to reduce the risk of injuries. In many cases, an injury is caused by different factors working together. For example, persistent back pain may be triggered by a combination of poor posture, being overweight, repetitive work-related activities and incorrect technique when playing sport. The physiotherapist aims to treat the back pain, but also to address the factors which contribute to the cause. This approach aims to reduce the risk of the injury happening again.

A range of therapies
Physiotherapists draw upon a wide range of therapies, tailored to suit your individual needs. Some of these therapies include:

- **Manual therapies** - such as massage, stretching, manual resistance training, joint mobilisation and manipulation, including spinal mobilisation.
- **Electrotherapy techniques** - such as ultrasound, transcutaneous electrical nerve stimulation (TENS), laser therapy and diathermy.
• **Exercise programs** - such as posture retraining, muscle strengthening, cardiovascular training and stretching.
• **Other services** - taping and splinting, correcting flawed sporting techniques, providing or offering information on equipment aids such as wheelchairs and walking frames.

**Finding a physiotherapist**
Physiotherapists in Australia are university trained, registered health care professionals. They work in a variety of places including hospitals, private practice, rehabilitation centres, nursing homes and sports clubs. You don’t need a doctor’s referral, but your doctor may recommend physiotherapy to help treat your condition or injury. Otherwise, the Australian Physiotherapy Association can help you find an appropriate physiotherapist in your area.

**Things to remember**
• The central aim of physiotherapy (physical therapy) is to restore proper functioning to the body.
• Physiotherapy can treat many different disorders including musculoskeletal, neurological or cardiothoracic conditions.
• Physiotherapists in Australia are university trained, registered health care professionals.
• You don’t need a doctor’s referral to see a physiotherapist.
Unit 14

Pollution - air
Pollutants in the air are caused by natural events (like bushfires and windstorms) or human activities (including industrial processes or driving motor vehicles). Examples of pollutants include gases, chemicals and airborne particles (such as dust and pollen). Melbourne's air quality has steadily improved over the past 15 years and is relatively good by international standards. Occasionally, Melbourne experiences ‘smog alert’ days. People with respiratory conditions such as asthma and heart disease should avoid strenuous exercise on these days.

Fuel combustion
Our air is mainly polluted by combusting fuel (such as gas, wood, petroleum or coal). Airborne contaminants vary from country to country, depending on a range of factors including population, industry, climate and the types of fuels burned. In Australia, motor vehicle emissions are the main cause of outdoor air pollution, accounting for around 75 per cent. In Melbourne, the most air-polluted regions are those with heavy traffic, in the inner suburbs where people burn fuels in fire places or in areas where there are wood heaters. The main pollutants include carbon monoxide, nitrogen dioxide, ozone, particulates (minute particles suspended in the air) and sulphur dioxide. Lead was phased out of petrol in 2003. Victoria does not have any major lead-based industries. The health effects associated with breathing in these contaminants include:

- **Carbon monoxide** - reduces the ability of the blood to carry oxygen.
- **Nitrogen dioxide** - may trigger asthma attacks and other respiratory disorders.
- **Ozone** - may trigger asthma attacks and other respiratory disorders.
- **Particulates** - effects depend on the particle’s chemical composition. Studies of populations in the United States (the ‘20 cities study’) and in Europe have shown that the level of particulates in the air is associated with the risk of death. Some of these deaths affect people with a serious pre-existing conditions but evidence also suggests air pollution can have a long-term effect on health.
- **Sulphur dioxide** - may trigger asthma attacks and other respiratory disorders.

Ozone depletion
The ozone layer sits around 10 to 50 kilometres above the surface of our planet. Its principle function is to moderate the amount of ultraviolet radiation from the sun. Ozone is produced by the action of sunlight on oxygen and is naturally destroyed by a range of rising gases. The production and destruction of ozone is a balancing act, but human activity is depleting ozone faster than nature can make it. Gases including chlorofluorocarbons (CFCs) and halons (compounds containing bromine and once used in fire extinguishers) are creating ‘holes’ in the ozone layer, which allow greater amounts of ultraviolet radiation to reach the earth’s surface. Health risks of ozone depletion include:

- Greater incidence of eye problems, including cataracts and pterygia (growths on the eye)
- Greater incidence of skin cancer.

The greenhouse effect
The earth insulates itself with greenhouse gases, which help to hold the warmth from the sun. Since the industrial revolution two centuries ago, human activity has increased the amount of greenhouse gases (such as carbon dioxide, methane, nitrous oxide, CFCs and halons). The generation of these greenhouse gases has risen spectacularly in the last 50 years, mainly due
to fossil fuels and vehicle exhaust. An increase in greenhouse gases makes the earth warmer and causes changes to weather and climate worldwide. Climate change projections for Australia developed by CSIRO suggest that annual average temperatures will increase between:

• 0.4C to 2.0C by 2030
• 1C to 6C by 2070.

These changes may affect agriculture and cause a greater incidence of health problems, including heat stress, mosquito-borne diseases and asthma.

**Indoor air pollution**

Research indicates that Victorians spend most of their time indoors, making indoor air pollutants an important risk factor for people’s health. Significant indoor pollutants include:

• Cigarette smoke
• Heaters and stoves without flues
• Chemical odours from freshly applied paint, glues or solvents
• Animal fur or dander
• Moulds
• Dust.

**Other home environment pollution**

Apart from general indoor pollutants, the outdoor environment at home can be polluted with fumes, particulates and odours. These can be a nuisance that may or may not affect you or your neighbours. The main contributors are:

• Wood heaters and open fires
• Lawn mowers.

**Hazardous substances**

Hazardous substances that can become airborne include:

• **Arsenic** - a substance that is found naturally in rock. It has been used to preserve timber and was an ingredient in chemicals such as pesticides and weed-killers. Small amounts of arsenic are normally taken into the body from low levels that are naturally present in soil, water, air and food. Swallowing a large amount of arsenic can cause severe health effects or even death.

• **Asbestos** - a silicate mineral made up of tiny fibres that form a dust when disturbed. Fibres breathed into the lungs can cause a range of health problems, including lung cancer and mesothelioma. Asbestos used to be a common building material because of its fire resistant and insulating properties, but now that we are aware of the health risks, it is no longer mined in Australia and its use has been phased out.

• **Cadmium** - a mineral bound with elements such as oxygen, sulphur and chlorine. It is found naturally in low levels in most foods and is one of the ingredients of cigarette smoke. Smelting other metals, like zinc and copper, produces cadmium. High exposure to cadmium by either breathing or eating it can cause a range of ill effects, including lung damage and kidney disease.

• **Lead** - a metal that can be found in lead-based paints in many homes and contaminated soil. Children are particularly sensitive to the effects of lead exposure. Acute poisoning is rare but can occur if a young child eats paint chips off old houses.

**Things to remember**

• Melbourne’s air quality is ranked as ‘good’ by international standards.

• Examples of pollutants include gases, chemicals and airborne particles.

• Around 75 per cent of Melbourne’s air pollution is caused by vehicle emissions, comprising gases (such as carbon monoxide, nitrous oxide and ozone) and particulates.

• Victorians spend most of their time indoors, making indoor air pollutants an important risk factor.
Unit 15

Pregnancy and smoking
Australian data indicates that approximately 20 per cent of women smoke during pregnancy, although this rate appears to be declining. A woman who smokes while pregnant is at increased risk of experiencing a wide range of problems including ectopic pregnancy, miscarriage and premature labour. Women who smoke are up to three times more likely to give birth to a low weight baby compared to non-smokers. Low birth weight babies are more vulnerable to infection and other health problems, such as breathing difficulties. The more cigarettes smoked during pregnancy, the greater the risk of complications.

Pregnancy complications
Some of the pregnancy complications more commonly experienced by women who smoke include:
• Ectopic pregnancy (pregnancy outside the uterus – usually in the fallopian tube)
• Foetal death (death of the baby in the uterus)
• Spontaneous abortion (miscarriage)
• Problems with the placenta, including early detachment from the uterine wall and blocking the cervical opening (placenta previa)
• Premature rupture of the membranes
• Premature labour.

Effects on the foetus
Every time a pregnant woman smokes a cigarette, her unborn baby is deprived of oxygen and exposed to the same cocktail of chemicals, including chemicals which cause cancer. Some of the many damaging effects of cigarette smoke on the foetus include:
• Reduced oxygen supply due to carbon monoxide and nicotine
• Retarded growth and development
• Increased risk of cleft lip and cleft palate
• Increased heart rate and disruption of the baby’s breathing movements in the womb due to the effects of nicotine.

Problems at birth
Some of the problems caused by maternal smoking include:
• Increased risk of premature birth.
• Increased risk of miscarriage and infant death.
• Lower birth weight - on average, about 250g less than normal.
• Twice the risk of sudden infant death syndrome (SIDS).

Problems with breast feeding
Over two thirds of female smokers who quit during pregnancy resume smoking once their babies are born. Some of the problems caused by maternal smoking while breastfeeding can include:
• The chemicals in cigarettes can pass from the mother to the baby via breast milk.
• Smoking reduces the amount of vitamin C in breast milk.
• Smoking can reduce milk production.

Problems for the child in later life
Smoking during pregnancy can impair a child’s health for years to come. Health effects may include:

• Decreased lung function
• Higher incidence of asthma
• Increased risk of developing behavioural problems, such as antisocial behaviour.

See your doctor if you need help to quit
Ideally, a pregnant woman should stop smoking. However, at most only one in three female smokers quit when pregnancy is planned or confirmed. If you need help, see your health professional for information and advice, or call the Quitline on 137 848.

If you are finding it tough to stop smoking, don’t despair. There is evidence to suggest that stopping smoking in the fourth month of pregnancy can reduce some of the risks, such as low birth weight.

Nicotine replacement therapy should be monitored
The use of nicotine replacement therapy (such as patches, gum, inhaler and lozenges) during pregnancy hasn’t been adequately researched, so it is unknown what effect these quitting aids may have on the baby. Therefore, it is recommended that pregnant women should consult their doctor before considering using nicotine replacement therapies. Pregnant women should also seek assistance from the Quitline and their health professional for alternative quitting methods.

Things to remember

• A woman who smokes while pregnant is at increased risk of experiencing a wide range of problems including ectopic pregnancy, miscarriage and premature labour.
• Babies whose mothers smoke during pregnancy are at a higher risk of having a low birth weight.
• Low birth weight is a risk factor for health problems including infections and breathing difficulties.
unit 16

Skin explained
The skin is the largest organ of the human body. It is soft, to allow movement, but still tough enough to resist breaking or tearing. It varies in texture and thickness from one part of the body to the next. For instance, the skin on the lips and eyelids is very thin and delicate, while skin on the soles of the feet is thicker and harder. The skin is a good indicator of general health. If someone is sick, it often shows in their skin.

A range of functions
Skin is one of our most versatile organs. Some of the different functions of skin include:
- A waterproof wrapping for the entire body
- The first line of defence against bacteria and other organisms
- A cooling system via sweat
- A sense organ that gives us information about pain, pleasure, temperature and pressure.

The epidermis
The skin you can see is called the epidermis. This protects the more delicate inner layers. The epidermis is made up of several ‘sheets’ of cells. The bottom sheet is where new epidermal cells are made. As old, dead skin cells are sloughed off the surface, new ones are pushed up to replace them. The epidermis also contains melanin, the pigment that gives skin its colour.

The dermis
Underneath the epidermis is the dermis. This is made up of elastic fibres (elastin) for suppleness and protein fibres (collagen) for strength. The dermis contains sweat glands, sebaceous glands, hair follicles, blood vessels and nerves.

Glands and blood vessels
The dermis is well supplied with blood vessels. In hot weather or after exercise, these blood vessels expand, bringing body heat to the skin surface. Perspiration floods out of sweat glands and evaporates from the skin, taking the heat along with it. If the temperature is cold, these blood vessels in the dermis contract, which helps to cut down on heat loss. Sebaceous glands in the dermis secrete sebum to lubricate the skin.

Hair and nails
Our lack of a complete cover of body hair makes human skin very different from the skin of any other animal. Hair is made up of a protein called keratin. The amount of hair on the body varies from place to place. Hairless sites include the lips, palms and soles of the feet. The hairiest sites include the scalp, pubis and underarms in both sexes, and the face and throat in men. Nails are made from skin cells but the only live parts are the nail bed and the nail matrix just behind the cuticle. The nail itself is made of dead cells.

Nerves
Both the dermis and epidermis have nerve endings. These transmit information on temperature, sensation (pleasure or pain) and pressure. Some areas have more of these nerves than others, like the fingertips for example.

Common problems
Some common skin problems include:
- Acne - caused by hormones
• Dermatitis - inflammation of the skin, with many different triggers
• Fungal infections - like tinea (athlete’s foot)
• Skin cancer - from long term exposure to the sun’s UV rays
• Sunburn - a radiation burn from the sun’s UV rays
• Warts - caused by a virus.
• Dermatologist

**Things to remember**

• Skin is the largest organ of the body.
• It is made up of two main layers, the epidermis and the dermis.
• Skin is a good indicator of general health.
Unit 17

Vegetarian eating
Vegetarians are people who don’t eat meat. With careful planning, a vegetarian diet can provide all the essential vitamins and minerals necessary for a long and healthy life. A vegetarian diet has many health benefits, but can result in some vitamin and mineral deficiencies if it is not carefully planned.

Types of vegetarians
There are three main types of vegetarianism. These are:
• **Lacto-ovo vegetarians** - people who avoid meat, but include dairy foods (such as milk and eggs) and plant foods.
• **Lacto-vegetarians** - people who avoid meat and eggs, but include dairy foods and plant foods.
• **Vegans** - people who consume only plant foods.

Health benefits of a vegetarian diet
A well-balanced vegetarian diet can provide many health benefits, such as a reduced risk of chronic diseases, including:
• Obesity
• Coronary artery disease
• Hypertension (high blood pressure)
• Diabetes
• Some types of cancer.
Vegetarians also have lower rates of illness and death from a number of degenerative diseases.

Meeting nutritional needs
If you choose to be vegetarian you need to plan your diet to make sure it includes all the essential nutrients. The wider the variety of foods you eat, the easier it will be to meet your nutritional requirements. Some essential dietary requirements, which could be missing from a vegetarian diet if it isn’t carefully planned, include:
• Protein
• Minerals (including iron, calcium and zinc)
• Vitamin B12
• Vitamin D.
Daily nutritional requirements depend on a range of individual factors such as age, gender and stage of life. If you consume around the amount recommended for your particular age and gender (and you have no underlying medical conditions), it is unlikely you will be deficient. Dietary recommendations for a range of nutrients are available from the Australian Nutrient Reference Values (NRVs) website.

Protein
Protein is essential for many bodily processes, including tissue building and repair. Protein is made up of smaller components called amino acids. A complete protein has all the amino acids necessary to make up protein. Most individual plant foods are not complete proteins; they only have some of the amino acids. Soy is the only complete vegetable protein.
It was once thought that vegetarians needed to combine plant foods at each meal to ensure they consumed complete proteins. Recent research has found that this is not the case.
Consuming various sources of amino acids throughout the day should provide the complete complement of protein.

Some good plant sources of protein include:
• Legumes, such as beans, peas and lentils
• Nuts
• Seeds
• Soy products, including tempeh and tofu
• Whole (cereal) grains.

It is recommended that vegetarians eat legumes and nuts daily, along with wholegrain cereals, to ensure adequate nutrient intakes.

Minerals
If you’re vegetarian you need to make sure you get the right amount of essential dietary minerals.

Some of these minerals, and suggested food sources, include:
• Iron - vegetarian diets are generally high in iron from plant foods; however, this iron is not absorbed as well as the iron in meat. Good food sources of iron include green leafy vegetables, peas and wholegrains, enriched cereals and legumes. Combining these foods with foods high in vitamin C will help your body absorb the iron.
• Zinc - performs essential functions in the body, including the development of immune system cells. Good food sources of zinc include nuts, tofu, miso, legumes, wheat germ and wholegrain foods.
• Calcium - is needed for strong bones and teeth. Good food sources of calcium include dairy products, fortified cereals and fruits juices, fortified soymilk, tahini and some brands of tofu. Leafy dark green vegetables (especially Asian greens), legumes, almonds and brazil nuts also contain calcium.
• Iodine - our bodies need iodine for the thyroid gland and other associated hormones to function normally. Iodised salt is the most common source of iodine in the Western diet. Iodine is found in seafood, which is a rich source of this element. Seaweed also contains iodine, but is also high in salt.

Vitamin B12
Vitamin B12 is important for the production of red blood cells; it helps to maintain healthy nerves and mental abilities. Microorganisms that are ingested by animals manufacture vitamin B12. Strict vegans are at risk of developing vitamin B12 deficiency because it is not found in plant products.

Anaemia is a common result of B12 deficiency. If a breastfeeding mother is following a vegan diet, the lack of vitamin B12 in her milk can interfere with her baby’s brain functioning.

Vitamin B12 can be found in dairy products and eggs. Vegans are advised to take B12 supplements. Vitamin B12 absorption becomes less efficient as we age, so supplements may be also be needed by older vegetarians.

Mushrooms are often claimed to be a source of B12. However, this is not accurate. They contain a compound with a similar structure to B12 but it doesn’t work like B12 in the body. They may contain some B12 on their surface, from soil (bacteria) or fertiliser contamination.

Vitamin D
The main source of vitamin D for most Australians is sunlight. There are few foods that contain significant amounts of vitamin D. There is very little vitamin D in most people’s diets unless they eat fatty fish, eggs, liver or vitamin D fortified foods (such as margarine).
Fortified low fat and skim milk is another source of vitamin D, but the levels are low. As the sun is also a major source of vitamin D, dietary intake is only important when exposure to UV light from the sun is inadequate - for example, in people who are house bound or whose clothing covers almost all of their skin.

**Vegetarian diets and children**
Well-planned vegan and vegetarian diets are appropriate for all stages of a person’s life. However, special care needs to be taken with children. Strict vegetarian diets are generally not recommended for young children. The bodies of growing infants and toddlers have enormous demands for protein, vitamins and minerals. Small deficiencies can have dramatic effects on development. One way to ensure that vegetarian children meet their energy needs is to give them frequent meals and snacks, and include foods higher in fat, such as dairy foods.

**A global view**
Some people choose to become vegetarian as a healthy lifestyle choice or for ethical reasons. There are also sound social reasons to be a vegetarian. Vegetables are a more efficient source of protein - 40 per cent of today’s world grain production is used to feed meat-producing livestock.
Converting these cereals and grains to animal products involves significant loss of energy. It takes 5kg of grain to produce 1kg of beef. If meat consumption were lowered, more cereal grains and other food components might be used to improve the world’s nutrition.

**Things to remember**
- Vegetarians don’t eat meat - for health, environmental, ethical, religious or economic reasons.
- A vegetarian diet needs to be well balanced to ensure you don’t develop protein, mineral or vitamin deficiencies.
- The stricter the diet, the greater the risk of deficiencies.
Unit 18

Water - a vital nutrient  The human body can last weeks without food, but only days without water. The body is made up of 55–75 per cent water. Water forms the basis of blood, digestive juices, urine and perspiration and is contained in lean muscle, fat and bones. As the body can’t store water, we need fresh supplies every day to make up for losses from lungs, skin, urine and faeces. The amount we need depends on our metabolism, the weather, the food we eat and our activity levels.

Facts about water in our bodies
Some facts about our internal water supply:
• Body water is higher in men than in women and falls in both with age.
• Most mature adults lose about 2.5–3 litres of water per day. Water loss may be more in hot weather and with prolonged exercise.
• Elderly people lose about two litres per day.
• An air traveller can lose approximately 1.5 litres of water during a three-hour flight.
• Water loss needs to be replaced.
• Foods provide about one litre of fluid and the remainder must be obtained from drinks.

Water is needed for most body functions
Water is needed to:
• Maintain the health and integrity of every cell in the body.
• Keep the bloodstream liquid enough to flow through blood vessels.
• Help eliminate the by products of the body’s metabolism, excess electrolytes, for example sodium and potassium, and urea which is a waste product formed through the processing of dietary protein.
• Regulate body temperature through sweating.
• Keep mucous membranes moist, such as those of the lungs and mouth.
• Lubricate and cushion joints.
• Reduce the risk of cystitis by keeping the bladder clear of bacteria.
• Aid digestion and prevent constipation.
• Work as a moisturiser to improve the skin’s texture and appearance.
• Carry nutrients and oxygen to cells.
• Serve as a shock absorber inside the eyes, spinal cord and in the amniotic sac surrounding the foetus in pregnancy.

Water content in food
Most foods, even those that look hard and dry, contain water. The body can get about half of its water needs from food alone. The digestion process also produces water as a by-product and can provide around 10 per cent of the body’s water requirements. The rest must come from liquids.

Dehydration
Dehydration occurs when the water content of the body is too low. This is easily fixed by increasing fluid intake. Symptoms of dehydration include headaches, lethargy, mood changes and slow responses, dry nasal passages, dry or cracked lips, dark-coloured urine, weakness, tiredness, confusion and hallucinations. Eventually urination stops, the kidneys fail and the body can’t remove toxic waste products. In extreme cases, this may result in death. Causes of dehydration include:
• Increased sweating due to hot weather, humidity, exercise or fever.
• Not drinking enough water.
• Insufficient signalling mechanisms in the elderly; sometimes they do not feel thirsty even though they may be dehydrated.
• Increased output of urine due to a hormone deficiency, diabetes, kidney disease or medications.
• Diarrhoea or vomiting.
• Recovering from burns.

When you need to increase fluids
If you regularly don’t drink enough water there is some increased risk of kidney stones and, in women, urinary tract infections. There is also limited evidence to suggest an increased risk for some cancers including bladder cancer and colon cancer. It can also lower your physical and mental performance and salivary gland function.

People who need more water in their diet include those who:
• Are on a high protein diet
• Are on a high fibre diet, as fluids help prevent constipation
• Are children
• Have an illness that causes vomiting or diarrhoea
• Are physically active
• Are exposed to warm or hot conditions.

Dehydration in elderly
Elderly people are often at risk of dehydration. This is due to:
• Changes to kidney function, which declines with age
• Hormonal changes
• Not feeling thirsty (because the mechanisms in the body that trigger thirst don’t work as well as we age)
• Medication (for example, diuretics and laxatives)
• Chronic illness
• Limited mobility.

Dehydration in babies and children
Children are susceptible to dehydration, particularly if they are ill. Vomiting, fever and diarrhoea can quickly dehydrate a baby. This can be a life-threatening condition. If you suspect dehydration, take the child immediately to the nearest hospital emergency department. Some of the symptoms of dehydration in a child include:
• Cold skin
• Lethargy
• Dry mouth
• Depressed fontanelle on the skull
• A blue tinge to the skin as the circulation slows.

Water intoxication (or hyponatremia)
Drinking too much water can also damage the body and cause hyponatremia. This is when sodium in the blood drops to a dangerously low level. Sodium is needed in muscle contraction and for sending nerve impulses. If too much water is consumed, the kidneys cannot excrete enough fluid. Water intoxication can lead to headaches, blurred vision, cramps (and eventually convulsions), swelling of the brain, coma and possibly death.

For water to reach toxic levels, you would have to consume many litres a day. Water intoxication is most common in people with particular diseases or mental illnesses (for
example, in some cases of schizophrenia) and in infants who are fed infant formula that is too diluted.

**Water and sports performance**
Athletes should drink 500ml of water two hours before an event, and then 300–500ml every 30 minutes during the event. For smaller athletes exercising in mild conditions, less fluid may be needed. Well-trained athletes competing at high intensity in warm conditions may need more fluid.

**Fluid retention**
Many people believe that drinking water causes fluid retention. In fact, the opposite is true. Drinking water helps the body rid itself of excess sodium, which results in less fluid retention. The body will retain fluid if there is too little water in the cells. If the body receives enough water on a regular basis, there will be no need for it to conserve water and this will reduce fluid retention.

**Recommended daily fluids**
Approximately six to eight glasses (at least 150ml each) of a variety of fluids can be consumed each day. More than eight glasses may be needed for physically active people, children, people in hot or humid environments, and breastfeeding women (who need an extra 750–1,000ml per day). Less water may be needed for sedentary people, older people, people in a cold environment or people who eat a lot of high water content foods.

**Sources of fluid**
Fluids include fresh water and all other liquids like juice, soft drinks, coffee, tea, milk and soup. Fresh water is the best drink because it does not contain kilojoules and has fluoride that is good for the teeth. Milk is important (especially for children) and tea can be a source of antioxidants, which appear to protect against heart disease and cancer. Fresh fruit is preferable to fruit juice because it has more fibre and nutrients and less sugar; sweet drinks should be limited because they add calories without nutrient value.

**Mineral water contains salt**
Commercially bottled mineral water contains salt, which can lead to fluid retention and swelling and even increased blood pressure in susceptible people. Limit the amount of mineral water or choose low sodium varieties (less than 30mg sodium per 100ml).

**Things to remember**
- Water is essential to most bodily functions.
- The body has no way to store water and needs fresh supplies every day.
- Dehydration is life threatening to a baby and requires urgent medical attention.
- It is recommended that you consume around eight glasses of water a day to prevent dehydration.
Unit 19

Weight loss and carbohydrates
Carbohydrates are the only fuel source for many vital organs, including the brain, central nervous system and kidneys. The digestive system breaks down carbohydrates into glucose and the pancreas secretes a hormone called insulin to help the glucose move from the blood into the cells.

Very low carbohydrate diets
Very low carbohydrate diets are becoming popular again. These diets often contain less than 60g of carbohydrate per day. Many health professionals do not support these diets because they have a high fat content (particularly saturated fat) and restrict fruit, vegetables and high fibre breads and cereals.

Low carb diets restrict healthy food choices
Advocates of very low carbohydrate diets advise people to consume kilojoules mainly from protein and fat sources. This means limiting cereals, some vegetables and fruit, while eating more meat, dairy foods and fat. Typical foods eaten on a low carbohydrate diet include beef, chicken, bacon, fish, eggs and non-starchy vegetables, as well as fats such as oils, butter and mayonnaise. Forbidden foods include fruit, bread, grains, starchy vegetables and dairy products other than cheese, cream or butter.

Very low carbohydrate diets do not meet your daily nutritional needs. To be healthy, your daily diet should include at least:
• Four serves of bread or cereals
• Two serves of fruit
• Five serves of vegetables
• Two cups of milk.

The long term safety of a diet very low in carbohydrates but high in saturated fat is still uncertain. Some experts believe it’s a recipe for a heart attack. Follow-up studies are needed over years to determine the safety of very low carbohydrate diets.

Weight gain comes from eating too many calories
The basic principle of any low carbohydrate diet is that carbohydrates cause weight gain. This is misleading. You gain weight if you consume too many kilojoules (or calories) - it doesn’t matter whether they are from carbohydrates, proteins or fats.

There’s nothing special about a low carbohydrate diet
Low carbohydrate diets cause you to lose weight because they restrict kilojoules or energy. This approach to eating starves the body of the nutrients it needs and can cause major metabolic disturbances to the body. There is nothing special about the proportions of protein to carbohydrate - there are just fewer kilojoules consumed in these diets, which causes the weight loss.

Low carb weight loss is mainly water in the short term
The body stores excess glucose as glycogen and converts glycogen back into glucose to use as fuel if there is not enough carbohydrate in the diet. Around 3g of water is needed to release one gram of glycogen, so the rapid initial weight loss on a low carbohydrate diet is mostly water, not body fat.
When a normal diet is resumed, some muscle tissue is rebuilt, water is restored and weight quickly returns, mostly as fat. This can contribute to the problem effect of dieting called the ‘yoyo’ effect.

**Weight loss needs a healthy approach**
A diet high in fruits and vegetables, wholegrains, legumes and low fat dairy products, and moderate in fat and kilojoules, is the best way to lose weight and keep it off. Vegetarians and people who consume predominantly plant-based diets are generally slimmer and have much lower rates of obesity, heart disease and cancer than people who eat meat-based diets. This supports current thinking that diets high in unrefined carbohydrates help to prevent overweight and obesity.

**Short term side effects of low carbohydrate diets**
Within a short period of time, the effects of a very low carbohydrate diet include:
- Nausea
- Dizziness
- Constipation
- Lethargy
- Dehydration
- Bad breath
- Loss of appetite.

**Potential long term effects of low carbohydrate diets**
The potential effects on health if a very low carbohydrate diet is consumed long term are unknown. However, these diets may be nutritionally inadequate because they contain few fruits and vegetables. They tend to be low in fibre, thiamin, folate, vitamins A, E and B6, calcium, magnesium, iron, potassium and antioxidant phytochemicals. Such a diet could increase a person’s risk of developing cancer by restricting intakes of antioxidants and fibre from fruits and vegetables.

Very low carbohydrate diets also tend to be high in saturated fat which can contribute to heart disease risk. Diets that are high in protein and fats are associated with abdominal obesity and obesity-related disorders including heart disease, diabetes and cancer.

If the body doesn’t receive enough carbohydrate, it breaks down muscle and other tissue to produce glucose. This causes a build-up of waste products called ‘ketones’. This state, known as ‘ketosis’, is commonly seen in people who are starving, suffering from anorexia nervosa or with untreated insulin-dependent diabetes. Ketones make the blood acidic. Ketosis can be fatal in severe conditions, particularly for pregnant women, their unborn babies and for people with diabetes. There is also evidence that the heart may not be able to function to its full capacity when ketone bodies are its main source of fuel.

**A very high protein diet can be dangerous**
High protein foods, such as meat, are usually high in saturated fats and cholesterol. Typically these high protein diets contain about 125g protein per day and moderate amounts of carbohydrate. The long term health risks of a diet high in protein include:
- High cholesterol, which is associated with a range of conditions including heart disease
- Increased risk of developing gout and gall bladder colic
- Kidney problems in people with impaired kidney function or diabetes
- Liver problems
- Loss of bone mineral content.
Select carbohydrates, proteins and fats carefully
If you do choose to follow a low carbohydrate diet, do not avoid carbohydrates completely - you need some in your diet to metabolise fat. Choose carbohydrate rich foods that are unrefined or unprocessed, including whole grains and fruit, rather than the more refined and energy-dense forms such as cakes, sweets and soft drinks. Have a variety of vegetables daily. Select a variety of protein rich foods that are also low in saturated fat, for example:
• Lean cuts of red meat
• Fish (including fatty fish)
• Lean chicken and pork.
You could also select protein rich foods that are plant-based, for example:
• Nuts
• Legumes such as beans and pulses
• Soy products, including tofu.
Choose fats from plant sources (such as olives, olive oil, canola oil, peanuts, peanut oil, soy or soy oil) rather than from animal sources (butter or meat fat).
Ultimately, to avoid weight gain, energy intake should not be more than energy output over a period of time. Avoiding large portion sizes will help keep energy intake in check. For long term weight management, the benefits of regular physical activity cannot be emphasised enough.

Things to remember
• Carbohydrates are essential for a healthy body and should not be removed from the diet.
• A very low carbohydrate diet combined with very high protein intake is not recommended.
• Very low carbohydrate diets tend not to lead to long term weight loss.
Unit 20

Yoga - health benefits
Yoga is an ancient Indian philosophy that dates back thousands of years. It was designed as a path to spiritual enlightenment, but in modern times the physical aspects of Hatha yoga have found huge popularity as a gentle form of exercise and stress management. There are many different varieties of Hatha yoga, but each one essentially relies on structured poses (asanas) practised with breath awareness. Researchers have discovered that the regular practice of yoga may produce many health benefits, including increased fitness and normalisation of blood pressure. Yoga is a renowned antidote to stress. Over time yoga practitioners report lower levels of stress and increased feelings of happiness and wellbeing. This is because concentrating on the postures and the breath acts as a powerful form of meditation.

The asanas
Each posture, or asana, is held for a period of time and synchronised with the breath. Generally, a yoga session begins with gentle asanas and works up to the more vigorous or challenging postures. A full yoga session should exercise every part of the body and should include pranayama (breath control practices), relaxation and meditation. The different postures or asanas include:
- Lying postures
- Sitting postures
- Standing postures
- Inverted, or upside down postures.

A range of benefits
The physical building blocks of yoga are the posture (asana) and the breath. A series of poses held over a period of time and synchronised with the breath exercises every part of the body. Benefits include:

- **Cardiovascular system** (heart and arteries) - asanas are isometric, which means they rely on holding muscle tension for a short period of time. This improves cardiovascular fitness and circulation. Studies show that regular yoga practise may help normalise blood pressure.
- **Digestive system** - improved blood circulation and the massaging effect of surrounding muscles speeds up a sluggish digestion.
- **Musculo-skeletal** - joints are moved through their full range of motion, which encourages mobility and eases pressure. The gentle stretching releases muscle tension and increases flexibility. Maintaining many of the asanas encourages strength and endurance. Weight bearing asanas may help prevent osteoporosis, and may also help those already diagnosed with osteoporosis, practised with care, under the supervision of a qualified Yoga teacher. Long term benefits include reduced back pain and improved posture.
- **Nervous system** - improved blood circulation, easing of muscle tension and the act of focusing the mind on the breath all combine to soothe the nervous system. Long term benefits include reduced stress and anxiety levels, and increased feelings of calm and wellbeing.

Anyone can practise yoga
Yoga is non-competitive and suitable for anyone, regardless of their age or fitness level. Your yoga teacher should carefully guide and observe you and modify postures when necessary. An asana should never cause pain. If it hurts, ease back on the stretch or don’t do it at all. It is important to keep within your physical limits. If you are over 40, haven’t exercised for a long
time or have a pre-existing medical condition, you should check with your doctor before starting any regular exercise routine.

**Different classes**
There are many different varieties of yoga, each one with a slightly different slant. Hatha yoga is one of the more popular forms in Australia. Yoga is taught in classes, catering for beginners through to advanced practitioners. Suggestions for getting the most out of your class include:
- Wear comfortable clothes and take a blanket, since many poses are performed sitting or lying down.
- Allow at least three or four hours since your last meal.
- Always tell your yoga teacher if you have a specific complaint, so they can advise against any asanas that may aggravate your problem.
- Always tell your yoga teacher if you are pregnant, have had a recent injury, illness, surgery, high blood pressure, heart problems, or osteoporosis.
- Don’t talk during the class because it will disturb your own quiet focus and that of others in the class.

**Things to remember**
- Yoga is an ancient science of living that incorporates gentle exercise, breath control (breathing practices called pranayama) and meditation.
- The physical foundation of yoga is a series of structured poses (asanas) performed with breath awareness.
- The health benefits of regular yoga practice may include alleviation of high blood pressure, improved posture and circulation, and a sense of wellbeing.