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## Blood and pathology tests

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### Summary

- Pathology means the study of disease and its causes and progression.
  - Pathology tests cover blood tests, and tests on urine, stools (faeces) and bodily tissues.
  - If you're sick, many of the decisions about your care will be based on the results of your blood and pathology tests.
  - Some common tests in Australia include a full blood count, liver function tests, and urinalysis.
  - Your doctor or healthcare professional will nominate the location for your test.
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Blood and pathology tests leave many people squeamish, but they're an important part of detecting, diagnosing and treating disease. In fact, if you're sick, many decisions about your care will come down to the results of your blood and pathology tests.

Pathology means the study of disease and its causes and progression. Pathology tests cover blood tests, and tests on urine, stools (faeces) and bodily tissues.

A pathologist interprets the results of blood and pathology tests and looks for abnormalities that may point to disease, such as **cancer** and other **chronic illnesses**, or health risks, such as **pre-diabetes**.

There are nine specialisations in pathology:

- chemical pathology – looks at the chemicals in blood and other bodily fluids
- haematology – explores blood disorders
- anatomical pathology – looks at disease in human tissue – for the most part this is body tissue surgically removed from living patients. Cytopathology (the study of disease at a cellular level) is a subspecialty of anatomical pathology
- medical microbiology – investigates infection caused by bacteria, viruses, fungi and parasites
- immunopathology – looks at immune responses to disease
- genetic pathology – looks at genetic diseases
- forensic pathology – used to discover the cause of sudden or unexpected death, or in cases where the police suspect a death was not due to natural causes
- general pathology – concerned with all aspects of laboratory investigation of disease
- clinical pathology – the diagnosis of disease using laboratory testing.

### Reasons to have a blood or pathology test

Apart from detecting and diagnosing disease, blood and pathology tests are important for:

- treating disease
- monitoring disease progression
- preventing disease (for example, a Pap smear or mammogram may reduce the risk of some common women's cancers through early detection)
- determining future risk of disease (for example, looking at cholesterol levels or the risk of inherited conditions such as familial breast cancer)
- aiding research into new treatments, and safety of treatments and procedures.

If your doctor or specialist sends you for blood and pathology tests, it's because there's some concern about your health (or you're at an age where health risks may be more likely) and a test is an effective way of discovering whether there's a problem. You may be sent for blood and pathology tests to:

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- **screen for disease** – screening may pick up a disease in its early stages, sometimes even before you're aware you have it, or a genetic or inherited disorder
- **look for potential health risks** – many risks to your health, such as diabetes, heart disease, or rheumatoid arthritis, can be detected with blood and pathology tests. Your doctor will look at your health history (such as age, weight, lifestyle and family history of disease) and your test results to assess your health risk
- **diagnose an illness** – if you're sick, your doctor may need test results to pinpoint the cause, and make an accurate diagnosis and treatment plan
- **give a prognosis** – if you have a disease, blood and pathology tests can help your doctor determine your prognosis (likely health outcome or course of your disease). If you have cancer, your doctor would use tests to work out the stage your disease has reached
- **prepare for treatment** – your doctor may need to take a blood test to determine your blood type before surgery or transfusion, for example
- **monitor your illness or medications** – your doctor will order tests to work out whether your illness is getting better or worse or remaining stable. They may also want to assess medication levels in your blood and the effects of some medications on your organs, for example.

### Screening versus investigation – the reason for tests

Some blood and pathology tests are used for screening purposes, while others are used for investigation of disease. The difference between the two usually lies in whether or not you have symptoms.

Screening is when simple tests are used in a healthy population to identify people who have disease, but do not yet have symptoms (early detection). Good examples are the promotion of regular bowel cancer screening for people over 50 years of age, and regular Pap smears for all women to detect cervical cancer. Some early antenatal tests are also an example of screening for risks to the unborn baby or its mother.

Screening is usually a national program, and government funded or sponsored. The idea is to pick up disease in its early stages.

If your tests are for investigation rather than screening, it means you or your doctor have concerns about your health or some symptoms, and tests will help to explore the problem further. Investigative tests are for an individual who presents with symptoms or concerns, not a general population.

### Common blood and pathology tests

In Australia, there are some common blood and pathology tests that you may be sent for if your doctor is investigating a possible health risk or illness. Your doctor will usually use the test results alongside other information such as your age, lifestyle and gender.

#### Full blood count

A **full blood count** is a common test that's used to diagnose a wide range of illnesses, infections and diseases. This test gives your doctor information about the numbers and development of cells in your blood (red cells, white cells, and platelets).

Abnormalities may indicate **anaemia**, **infection** or some blood cancers, such as **leukaemia**.

#### Liver function tests

If your doctor needs a close look at your **liver**, you may have some **liver function tests**, which measure enzymes, proteins, and substances produced or excreted by the liver. If your tests show liver damage, it may mean you have one of the many diseases or infections that affect the liver. These tests can be essential to early diagnosis and treatment.

#### Iron studies

A **check of your iron levels** will tell your doctor whether you have too little or too much **iron**, which is essential to normal red blood cell function. If your levels are low, you may have **anaemia** (symptoms may include fatigue and lack of energy) which may point to underlying disease.

**Too much iron** (iron overload or haemochromatosis) may increase your risk of serious conditions, such as liver disease, heart failure, arthritis or diabetes.

## Thyroid stimulating hormone (TSH) quantification

The **TSH test** looks for or monitors thyroid disorders such as **hypothyroidism** (insufficient thyroid hormone), **hyperthyroidism** (excess thyroid hormone), some cancers, and autoimmune conditions.

TSH tells the thyroid to make hormones that are essential to many bodily functions, including breathing, heart rate, body weight, temperature and energy levels, so it's important to check it's working properly.

## Urinalysis

A **urinalysis** is a set of tests on a sample of urine that look for a range of diseases, including liver or kidney disease, diabetes, and other outcomes such as pregnancy. Urinary tract infections may also be diagnosed with this test or what's known as a rapid urine test.

## INR (International Normalised Ratio)

An **INR** is an example of one type of test that looks at a medication's effectiveness. The INR investigates how well a patient's blood clots. It's an especially important regular test for people on the anti-clotting medication warfarin, which is used to prevent stroke, or clotting after surgery, for example.

## Typical pathology test procedures

Having a blood or pathology test is usually a relatively simple, standard procedure following these steps.

### Blood test

- You attend your appointment at the location of your test.
- You may be asked to sit or lie down for the blood collection.
- The person collecting your blood (technically called a phlebotomist, but it may be a nurse or other healthcare professional) will put a tourniquet around your arm (above the elbow) and tighten it to increase blood volume in your veins. You may be asked to clench and unclench your first a few times to help get sufficient blood into your veins.
- The phlebotomist will wipe clean the site of the injection to reduce risk of infection, then insert a needle into your vein and draw the blood.
- The blood will flow into a syringe or vial.
- You may experience a little discomfort during the procedure. Tell the phlebotomist if you have any concerns or feel unwell.
- The phlebotomist will ask you to press a cotton wool ball against the injection site for a few moments, and will then place some adhesive dressing over the site. You may have minor bruising at the site afterwards.

### Urine sample

- You may be asked to collect a sample of your urine at your doctor's office or in your own home.
- You will be given a small collection bottle in which to collect the urine.
- Often, your doctor will ask for 'midstream' urine, which isn't the urine that you pass first or last, but the urine about midway through your urination.
- Wash your hands thoroughly after collecting your sample.
- If you're at your doctor's office, your doctor may do a 'rapid urine test' in which they put a test strip into the urine sample to give quick results of pregnancy or a reason for acute symptoms like pain.
- If you're asked to collect urine samples at home, you may have to package up your collection bottles and mail or deliver them to a test laboratory.

### Stool sample

- Stool samples are usually collected in your own home.
- You may be given a test kit with gloves and a small container in which to collect your faeces.
- It's usually better to urinate before taking the sample so urine doesn't go in with the faeces. Also be careful not to collect toilet water in with the sample.

- Collect the faeces into a clean container (or place some newspaper or plastic over the toilet bowl to collect it), and then use the small spoon or scoop that comes with your collection kit to place a sample of the faeces into the collection container. Place as much faeces into the container as instructed, usually around a third full.
- Don't let the stool sample touch the inside of the toilet bowl.
- Screw on the lid to the collection container.
- If you're instructed to, write your name, date of birth, and the collection date on to the container.
- Follow instructions for handing in the sample to your doctor or the test lab.
- Discard items you've used to collect the sample, and wash your hands thoroughly.

### Where to go for blood and pathology tests

Your doctor or healthcare professional will nominate the location for your test.

Pathology tests are usually conducted at an approved or accredited hospital, medical centre, collection centre or pathology laboratory.

In Australia, the National Association of Testing Authorities (NATA) and the Royal College of Pathologists of Australasia (RCPA) jointly accredit approved pathology laboratories. You can check a location's accreditation on the [NATA website](#).

### Remember...

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### Where to get help

- Your doctor
- Medical centre
- Hospital
- Pathology service

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