



# PathWay

THE ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALASIA



AUGUST 2014 | Published by RCPA

Issue #039

## In This Issue

- Pathologists add value to cancer diagnosis, prevention, treatment and research
- Why settle for second best with HIV-testing?
- Haemochromatosis highlights a notable design fault in our body
- Mesothelioma is a progressive and incurable asbestos-related disease

## Welcome to the August edition of ePathway

Education about and continual awareness of different diseases are important so we've highlighted two this month to coincide with their respective national campaigns. August 11-17 was Haemochromatosis Awareness Week in Australia, and August 22 was Daffodil Day which shines the spotlight on cancer, so we've looked at them both including the role of pathology in diagnosing cancer.

The incidence of human immunodeficiency virus (HIV) is also on the rise in Australia and, along with it, different methods of diagnosis. We've looked at the pros and cons of these methods compared to laboratory testing.

Asbestos and mesothelioma are also making headlines on both sides of the Tasman Sea, so our final article outlines how this cancer comes about and how it is diagnosed.

Don't forget to check our [Facebook](#) page regularly and keep up-to-date with what's happening in pathology by following our CEO Dr Debra Graves (@DebraJGraves) or the College (@PathologyRCPA) on Twitter. While you're online, check out the [Know Pathology Know Healthcare Facebook](#) page as well.

## Interesting Facts

100%

The proportion of cancers in which pathology is integral to the diagnosis

1 for every  
13,215  
people

The ratio of pathologists to population of Australia

## Vale Drs Roger and Jill Guard

It was with immense sadness that we learned a Fellow of the Royal College of Pathologists of Australasia (RCPA), Dr Roger Guard, and his wife Dr Jill Guard were onboard MH17. Dr Guard was a well-respected pathologist in Queensland, and a valued member of the medical community and wider community in Toowoomba.

Our thoughts are with their family members, including their son David Guard who is a trainee at our College, their colleagues, and all of the loved ones affected by this inconceivable tragedy.

Pathologists add value to cancer diagnosis, prevention, treatment and research

1 for every  
19,731  
people

The ratio of pathologists to population of  
New Zealand

Source: Peter MacCallum Cancer Centre, RCPA

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August shines the spotlight on cancer through the Cancer Council's annual Daffodil Day. This day represents hope for a cancer-free future and raises vital funds for cancer research, patient support and prevention programs. It's therefore a good time to also reflect on the value pathology adds to cancer prevention, diagnosis, treatment and research.

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## Why settle for second best with HIV-testing?

The current resurgence of Human Immunodeficiency Virus (HIV)<sup>[1]</sup> in Australia has prompted a number of strategies to attempt to diagnose people currently at risk of HIV infection who remain untested and/or undiagnosed. Two strategies, Point of Care Tests (PoCT) for HIV and HIV self-testing kits<sup>[2]</sup>, might seem like great ideas, but they are far from perfect solutions.



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## Haemochromatosis highlights a notable design fault in our body

Our bodies are engineering masterpieces, but there is one notable design fault. We can't get rid of excess stores of iron, which is a problem for people with haemochromatosis<sup>[1]</sup>. This inherited disorder is believed to have developed in Ireland about 40,000 years ago in response to the lack of iron in the diet during famine. Vikings then spread the haemochromatosis gene during their 'visits' to other countries.



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## Mesothelioma is a progressive and incurable asbestos-related disease

Asbestos is making headlines on both sides of the Tasman Sea in terms of finding and removing asbestos containing material (ACM) from homes and offices because exposure to asbestos continues to be a major health hazard. While there are a number of asbestos-related diseases, mesothelioma is the most lethal so we've asked an expert about what it is and how it's diagnosed.



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JUNE 2014 | PUBLISHED BY RCPA ISSUE #037

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- HPV test may renew Australia's National Cervical Screening Program
- Quality assurance processes are finally

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## Pathologists add value to cancer diagnosis, prevention, treatment and research



August shines the spotlight on cancer through the Cancer Council's annual Daffodil Day. This day represents hope for a cancer-free future and raises vital funds for cancer research, patient support and prevention programs. It's therefore a good time to also reflect on the value pathology adds to cancer prevention, diagnosis, treatment and research.

Dr Michael Dray, Consultant Histopathologist at Waikato Hospital in Hamilton, New Zealand, says pathologists diagnose almost all cancers.

"When a person has a cancer removed from any part of their body, it is sent to a pathologist for analysis and diagnosis," he explains.

"Pathologists examine the specimen and report to the surgeon if the person does or doesn't have cancer. If they have cancer, the pathologist lets the surgeon know if they removed it all from the patient, informs them if it is a primary or secondary cancer, provides prognostic information such as how the tumour will behave, and gives predictive advice in terms of treatment options for that particular type of cancer and how likely it is to respond."

Dr Dray says the clinical interpretation of the pathology result is important, especially when a definitive diagnosis can't be provided at first.

"We always try to give a sense of certainty, but sometimes pathologists can't provide a definitive diagnosis because of many factors such as the amount or integrity of the tissue sent to us for analysis, or because of confounding clinical factors associated with a particular case," he says. "When this happens further investigations are usually required, and these are often guided by pathologists."

Pathologists are also actively involved in cancer research and the early detection of many types of cancers through screening programs. One example is the discovery of pre-cancerous changes in routine pap smears. Pathologists are also the force behind the genetic revolution which has significant implications for cancer prevention, diagnosis and treatment.

Since we are pausing to think the value pathologists bring to the cancer journey, including diagnosing almost all cancers, it's a good time to also reflect on what life would be like without pathologists via this [video](#). Which would you prefer if you had a suspected cancer? A tickleoscopy, or a pathologist who is a specialist doctor with a minimum of 13 years training, determining your diagnosis?

Daffodil Day was on August 22 this year. More information about this event is available on the [Cancer Council's](#) website.

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The current resurgence of Human Immunodeficiency Virus (HIV)<sup>[1]</sup> in Australia has prompted a number of strategies to attempt to diagnose people currently at risk of HIV infection who remain untested and/or undiagnosed. Two strategies, Point of Care Tests (PoCT) for HIV and HIV self-testing kits<sup>[2]</sup>, might seem like great ideas, but they are far from perfect solutions.

Dr Lyn Waring, Director of Microbiology and Immunoserology at Melbourne Pathology and a member of the Microbiology Advisory Committee for the Royal College of Pathologists of Australasia (RCPA), says people in Australia have easy access to high quality health care, including world-class pathology laboratories, so why settle for second best?

“The concern about PoCT for HIV and HIV self-tests is there are too many associated issues including quality control, the prevalence of false positive and false negative results, insufficient counseling about the result, traceability of the result including where it is recorded, and the lack of follow up or clinical advice about associated conditions and when to test for these.”

Dr Waring says there are also increased rates of syphilis and other preventable sexually transmitted infections (STIs) in Australia at present which haven't received the same attention as HIV.

“When a person is tested through a pathology laboratory, the pathologist will contact the referring doctor and discuss the patient's clinical history to advise them of other tests that might be appropriate, such as testing for other STIs,” she says. “There is also a need to educate the public again that HIV and other STIs are preventable diseases through using condoms and other preventive measures.”

Dr Waring says while PoCT and self-testing may be seen as decreasing barriers to testing, positive results still need a confirmatory laboratory-based pathology test and negative results might not actually be negative.

“A negative result can falsely reassure people. There is a window of time where the viral load is still too small for PoCT and



self-tests to pick it up. The consequence of falsely negative tests is the risk of falsely reassuring a patient that they are not infected when they actually are, and they can spread the infection unknowingly by having unprotected sex. For example, if a 'day after' test is negative then that person may think they are fine when they are not."

Another reason PoCT and self-tests may be viewed as more desirable is their timely results. But Dr Waring points out laboratory test results are also available relatively fast – and deliver certainty as well.

"A reliable negative test result can be obtained very quickly from a pathology laboratory. For example, a needle stick injury marked urgent can have a result in two hours. For other samples it is 24 hours or less for a quality controlled test in a world-class laboratory system. Slower turn around times occur for positive results, but it is still within hours. A confirmatory laboratory test still needs to happen for a positive result no matter which system is used, including self testing. Why not use the best and most reliable system in the first place?"

Dr Waring says she can see the sense in using HIV PoCT and self-tests in high-prevalence countries that also have poor medical infrastructure. But she argues Australia has a low prevalence of HIV, even with the current resurgence, and has a world-class pathology system – so why not use it to ensure the result is reliable every time? The stakes are certainly high enough to not settle for second best.

[1] HIV is covered in the [July 2011](#) edition of ePathWay

[2] Rapid HIV is covered in the [February 2013](#) edition of ePathWay

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## Haemochromatosis highlights a notable design fault in our body



Our bodies are engineering masterpieces, but there is one notable design fault. We can't get rid of excess stores of iron, which is a problem for people with haemochromatosis<sup>[1]</sup>. This inherited disorder is believed to have developed in Ireland about 40,000 years ago in response to the lack of iron in the diet during famine. Vikings then spread the haemochromatosis gene during their 'visits' to other countries.

Haemochromatosis is a metabolic condition that causes increased absorption of dietary iron. It is usually inherited, but a similar situation (haemosiderosis) can also occur from multiple blood transfusions. Iron that is excess to the body's needs is stored as molecules such as ferritin in organs such as the liver, heart and pancreas, and can result in organ damage if it's not removed. Early diagnosis is important to avoid complications such as organ failure and death.

"Diagnosis of haemochromatosis happens in a number of ways," explains Associate Professor Merrole Cole-Sinclair, Head of Laboratory Haematology at St Vincent's Hospital in Melbourne.

"A doctor might be investigating an abnormal iron studies profile in the blood or disorders that might be complications of haemochromatosis, such as diabetes or liver disease, and will then back track to find out if there is a specific cause. Or a doctor might investigate a family member of a person known to have haemochromatosis to see if they have also inherited the condition."

A/Prof Cole-Sinclair says haemochromatosis can also be an incidental finding. She recently requested iron studies on a patient in his 30s for a reason unrelated to haemochromatosis, but the pathology results suggested a possible diagnosis of haemochromatosis. Her suspicion was correct, and the disease was subsequently discovered in a number of this patient's family members.

Treatment for haemochromatosis involves removing regulated amounts of blood (and therefore iron) at regular intervals through venesection. This process is similar to a routine blood donation.

“Venesections are often relatively frequent after the initial diagnosis, but then settle down to less frequent regular intervals once blood tests indicate that less iron is being stored in the body,” says A/Prof Cole-Sinclair.

Blood from donors with hereditary haemochromatosis can be used for clinical use through the Australian Red Cross Blood Service provided standard donor screening and other donation criteria are met.

Once the disease is under control, A/Prof Cole-Sinclair says regular blood tests are needed to monitor the disease including checking the patient’s iron status and markers of organ function.

“We can absorb iron, store it and move it around our bodies as needed, but we can’t successfully excrete large amounts from our system,” she says. “Iron is lost via blood in the menstrual cycle, cell turnover or through the skin via sweat, but not in the amounts required if you have haemochromatosis. Since iron in tissues is damaging to the cells, not being able to remove it from our bodies when it is in great excess could be seen as a human ‘design defect’, but one that can be managed.”

August 11-17 was Haemochromatosis Awareness Week in Australia. You can find out more about this disease by visiting the [Haemochromatosis Australia website](#).

[1] Haemochromatosis was also covered in the [August 2011](#) edition of ePathWay

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## Mesothelioma is a progressive and incurable asbestos-related disease



Asbestos is making headlines on both sides of the Tasman Sea in terms of finding and removing asbestos containing material (ACM) from homes and offices because exposure to asbestos continues to be a major health hazard. While there are a number of asbestos-related diseases, mesothelioma is the most lethal so we've asked an expert about what it is and how it's diagnosed.

Dr Jane Twin, Director of Cytopathology at Capital Pathology in Canberra, says mesothelioma is an unpredictable disease that takes between 10 to 50 years to appear after exposure to (usually) microscopic asbestos fibres.

"The type of asbestos that a person is exposed to is important. Some asbestos has long floppy fibres that can become trapped in the airways and coughed back up again. Other types have short, sharp fibres that make their way through the airways and into the alveolar sacs, and these are harder for the body to remove," explains Dr Twin.

Mesothelioma is a type of cancer that affects mesothelial cells. These cells cover the organs in the chest (where they form the pleura) and abdomen (where they form the peritoneum), although the most common type of mesothelioma occurs in the pleura.

The pleura is made up of two layers of thin membrane. The inner layer is attached to the lungs and the outer layer lines the chest wall and diaphragm. The space between these layers is called the pleural cavity. When asbestos fibres are breathed in they can find their way into the pleura, which is made up of mesothelial cells, causing it to thicken and form lumps.

"Diagnosing mesothelioma involves examining the patient and obtaining a detailed history, looking at radiological findings and sending specimens such as fluid and/or tissue from the person to a pathology laboratory for analysis," says Dr Twin. "For example, a patient may present to their doctor with one-sided chest pain and an x-ray might show they have fluid in their

pleural cavity. This fluid may be drained and a sample sent to a pathology laboratory for analysis.”

Dr Twin says if the cells from this fluid contain mesothelial cells that look ‘sick’, then the pathologist will be suspicious that it’s mesothelioma. But the diagnosis can only be confirmed after examining a specimen of tissue obtained from a biopsy.

“The cancer can be on the lung side or the chest side of the pleural cavity, or it can be large enough to join these two membranes together. It is different to lung cancer as lung cancer occurs inside the lungs while mesothelioma develops outside the lungs in the pleural cavity.”

Dr Twin says there is also a relationship between asbestos-related disease and smoking.

“The damage to lungs from smoking increases the risk of developing asbestos-related disease exponentially. The figure most commonly used is a fifty fold increased risk of lung cancer if you smoke and have also been exposed to asbestos.”

Mesothelioma is a progressive and incurable disease that is often diagnosed in its later stages. While it doesn’t usually have a happy ending, Dr Twin says there is a dose relationship associated with the development of asbestos-related disease, and genetic and other environmental influences also play a part.

“Not everyone who is exposed to asbestos dust develops disease,” she says.

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