



# PathWay

THE ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALASIA



Issue #009

NOVEMBER 2011 | Published by RCPA

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- Australia and New Zealand still top skin cancer list
- The D factor can be dangerous to babies
- Pathology tests 101 – it's time to do some homework

## Interesting Facts

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The proportion of the world's population infected with the Tuberculosis (TB) bacillus

10 to 15

The number of people who become infected with TB each year by one person with untreated active TB disease

## Welcome to the November edition of ePathWay

*This month's articles include a summer update on skin cancer, the danger of Rhesus disease to babies, some tips on working out if tests are valid and the pathology perspective on handing over Tuberculosis (TB) management to Papua New Guinea (PNG).*

*TB is far from being an 'old time' disease and is still active in many countries including Australia and PNG. While antibiotics have been effective in treating this infection, TB notifications have stopped falling in Australia and New Zealand.<sup>1</sup> Incidences of multidrug-resistant TB (MDR-TB) are also rising in many regions of the world including PNG. One key way to help protect Australia from the rising spread of MDR-TB is to assist our poorer neighbours in their struggle to control the disease. As one doctor commented: "This is not philanthropy, it is just common sense."<sup>1</sup>*

*We welcome your feedback about the stories covered in ePathWay, and hope you find it an invaluable way of being kept up to date about pathology in Australasia.*

<sup>1</sup>Johnson PDR. Extensively resistant tuberculosis in the lands Down Under. MJA; 2011; 194 (11): 565-566.

[http://www.mja.com.au/public/issues/194\\_11\\_060611/joh10225\\_fm.html](http://www.mja.com.au/public/issues/194_11_060611/joh10225_fm.html)

## Mates don't set unrealistic expectations

# 1.7 million

The estimated number of people who died from TB in 2009

Source: WHO Fact sheet no 104, November 2010

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## Australia and New Zealand still top skin cancer list

Australia and New Zealand have the highest incidences of skin cancer in the world. In Australia, non-melanoma skin cancers (NMSC) are four times more common than all other cancers combined, while melanoma is the leading cause of cancer death among people aged 25 to 44 years in New Zealand. With statistics like these, who wouldn't want to slip, slop slap every time they ventured outside?



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## The D factor can be dangerous to babies



Haemolytic disease of the newborn (HDN) is like a sequence from a horror movie. The pregnant mother's body thinks her baby's blood is a threat, so it



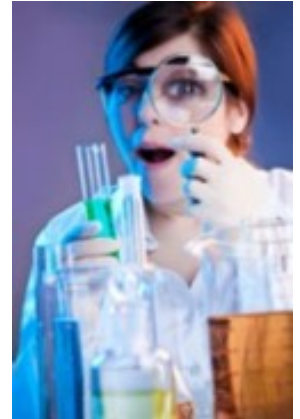
produces antibodies that cross the placenta and attack the unborn baby's red blood cells causing the potentially life-threatening HDN. Unfortunately this scenario is real and babies are still suffering this fate when HDN is preventable.

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## Pathology tests 101 – it's time to do some homework

Here's an interesting scenario. Pam had a melanoma removed by a surgeon, and instead of sending it to a pathology laboratory where a pathologist would examine the specimen and report what type of melanoma it was, she decided to take it home and work this out for herself. Pam bought a home-testing kit, and the manufacturers promised she would be 100 percent satisfied with the results or she could have her money back.



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## Mates don't set unrealistic expectations



Multidrug-resistant strains of tuberculosis (MDR-TB) active in the Western Province of Papua New Guinea (PNG) are spreading to the Torres Strait Islands and Australia. There are also cases of extensively drug-resistant tuberculosis (XDR-TB) in PNG, which are even more difficult to treat. This makes the Queensland and Federal governments' decision to close tuberculosis clinics on two Torres Strait islands a risk to public health not only in PNG, but in Australia as well.

The clinics, which have been providing treatment to PNG nationals, will be shutdown based on rolling handover dates and not on PNG's ability to manage TB. Queensland Health is closing the clinics because TB patients are not viewed as emergency cases. A staged handover process commenced on October 13 with 21 patients transferred from Queensland Health care to PNG care. There are two more planned handover clinics currently scheduled for December 2011 and February 2012.

TB is caused by various strains of mycobacteria, usually *Mycobacterium tuberculosis* (MTB). It typically attacks the lungs but can also affect other parts of the body. TB is spread through the air when people who have an active MTB infection cough, sneeze, talk, spit or otherwise transmit their saliva through the air. Just a few TB germs, known as bacilli, need to be inhaled by a person to become infected. A normal TB infection takes about six to nine months of drug therapy to treat, while managing MDR-TB and XDR-TB is more expensive, the treatment is longer and the drugs are toxic.

Dr Robert Norton, Director of Pathology at Townsville Hospital, says a significant number of complicated TB patients originate in PNG, with many seen and managed in either the Torres Strait Island clinics or at Cairns Base Hospital. The Townsville Hospital receives complex cases, such as those with cerebral and spinal TB or MDR-TB. If the handover is enforced, these patients – including children - may not be diagnosed early or treated appropriately. Diagnostic ability is therefore critically important in managing this complex disease.

“PNG does not have access to the full facilities or the staff to deal with TB,” says Dr Rob Baird, Director of Pathology at Royal Darwin Hospital. “You require up-to-date laboratory facilities which can reduce the confirmation of TB and drug resistance from eight weeks to two hours. This enables more informed treatment to start earlier.”

The Australian government has provided some funding towards helping PNG cope with TB, and the World Health Organization (WHO) is working with the PNG government on this issue. It remains to be seen exactly how the impoverished Western Province of PNG, where the hospital has problems accessing clean water, medication and qualified staff combined with inadequate laboratory facilities, will cope with managing something as complex and expensive as TB in the near future?

Then there is the confounding Human Immunodeficiency Virus (HIV) factor.

“In terms of public health, TB rates increase along with HIV rates because HIV is a virus that destroys the immune system, and TB surfaces in people with compromised immune systems,” Dr Baird explains. “Unfortunately both of these diseases are increasing in PNG and we are therefore anticipating more TB cases which is a public health problem. The WHO also identified TB as being in the top 10 infectious diseases and a priority for the world to address along with HIV and malaria.”

Dr Norton says the clinical reason not to close these clinics is that there are a number of cases of MDR-TB in PNG.

“Doctors are concerned that if we’re not careful MDR-TB will enter mainstream Australia because there will still be movement of people across borders,” he says. “Detecting and treating TB on our doorstep is the best approach.”

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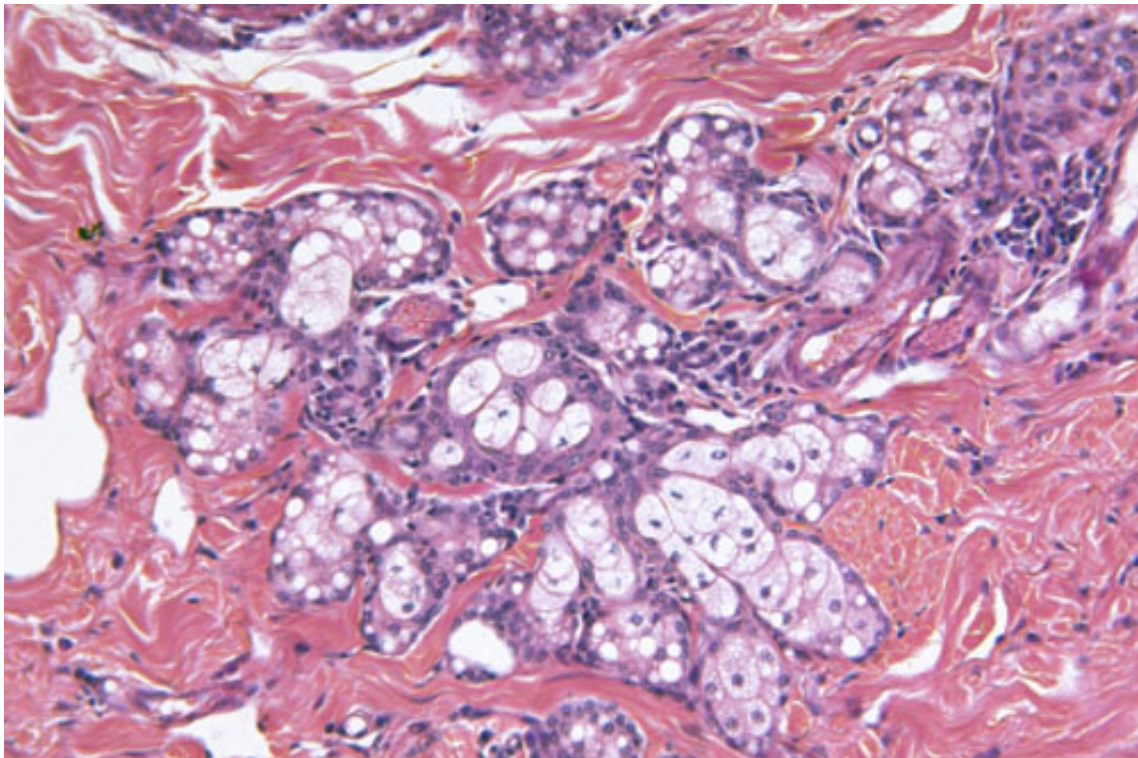
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## Australia and New Zealand still top skin cancer list



Australia and New Zealand have the highest incidences of skin cancer in the world. In Australia, non-melanoma skin cancers (NMSC) are four times more common than all other cancers combined, while melanoma is the leading cause of cancer death among people aged 25 to 44 years in New Zealand. With statistics like these, who wouldn't want to slip, slop slap every time they ventured outside?

"Australia and New Zealand have large populations of Anglo Celtic descent who live close to the equator and who also enjoy an outdoor lifestyle," says Professor Richard Scolyer, skin pathologist at the Royal Prince Alfred Hospital (RPAH) and Melanoma Institute Australia. "Their skin is very susceptible to damage from the sun, especially the closer you live to the equator where there are higher levels of solar radiation."

Professor Scolyer says there are more than 20 types of skin cancer, but by far the most common are basal cell carcinoma (BCC) and squamous cell carcinoma (SCC), which are classified as non-melanoma skin cancers, and melanoma.

BCC is the most common form of skin cancer. It grows from cells in the lowest layer of the epidermis (the superficial part of the skin), called the basal cell layer, and is mostly associated with recreational and intermittent sun exposure. BCCs are also called rodent ulcers because they can burrow into the

skin.

“I have seen BCCs burrowed into the eye and the brain, but it is rare for them to spread,” says Professor Scolyer. “BCCs are also twice as common as SCCs.”

SCC is the second most common form of skin cancer and develops from squamous cells of the epidermis. SCCs are more aggressive than BCCs and have a significantly higher risk of spreading to other sites of the body. They are mostly associated with cumulative exposure to the sun.

Melanomas are the third most common form of skin cancer, as well as the fourth most common form of all cancers and the ninth most common cause of death due to cancer in Australia and New Zealand. Professor Scolyer says they are primarily caused by UV radiation and are particularly associated with intermittent exposure to the sun. There are different types of melanoma, and they have a high risk of spreading to other parts of the body if they are not identified and treated early.

“Pathologists play a vital role in the diagnosis of melanomas as well as non-melanoma skin cancers,” explains Professor Scolyer. “They determine the sub-type of the cancer, and document the pathological features that affect the prognosis and determine the appropriate treatment for that skin cancer.”

You can't beat skin cancer by getting a tan in a solarium either. Professor Scolyer says they increase the risk of melanoma, particularly in people younger than 35 years of age.

As with any disease, prevention is better than cure, and Professor Scolyer advises people to:

1. Avoid the sun at the most intense hours of the day (10am – 2pm).
2. Use physical barriers such as protective clothing and hats and stay in the shade where possible.
3. Wear broad spectrum 30+ or greater sunscreen.

“Of course, if there are any skin changes then people should see their GP as soon as possible,” he advises. “The earlier you detect and treat any type of skin cancer the better your chances of a good outcome.”

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Haemolytic disease of the newborn (HDN) is like a sequence from a horror movie. The pregnant mother's body thinks her baby's blood is a threat, so it produces antibodies that cross the placenta and attack the unborn baby's red blood cells causing the potentially life-threatening HDN. Unfortunately this scenario is real and babies are still suffering this fate when HDN is preventable.

HDN is also known as Rhesus (RH) disease because it can occur if there is RH factor incompatibility between the mother and her unborn child. While the RH factor includes several proteins, the most important is the D antigen (protein) that is either present or absent on the surface of a person's red blood cells. Those who have the D antigen are grouped as RH positive, and those without the D antigen are grouped as RH negative. The antigen's role is to help the body distinguish its own blood from the blood of another person.

"If the mum is RH negative and exposed to an RH positive antigen, she may make antibodies that can cross the placenta and attack the baby's red blood cells," explains Dr Ben Saxon, haematologist with the Australian Red Cross Blood Service. "It is just like you or I being exposed to a virus. Our bodies will



make antibodies to kill that virus because it sees it as a threat.”

Ms Fiona Hermann, midwife and midwifery lecturer at the Waikato Institute of Technology in New Zealand, says women should find out if they are RH negative or positive in case they have an event during pregnancy where their blood and the baby’s blood mix.

“The maternal and foetal blood can mix during miscarriage, abortion or haemorrhage during pregnancy, and during childbirth,” she says.

Finding out the RH factor involves a simple blood test, and if a pregnant woman is RH negative she is advised to have an anti-D injection. Anti-D is a plasma product produced from blood donations of selected RH D negative donors. It eventually breaks down in the body, so every new pregnancy needs a new dose of anti-D.

“Giving anti-D is passive immunisation. If any foetal blood cells get into the mother’s circulation then the anti-D will destroy them before her immune system knows they were there. This also means the mother’s body won’t make antibodies,” explains Dr Saxon. “It’s like putting a wall of protection between the mum and the foetus.”

HDN may not affect an uneventful first pregnancy if an RH negative mother decided not to have anti-D, but the situation worsens with every pregnancy.

“The blood in the placenta is foetal blood and some of this always finds its way into the mum’s circulation because the barrier between the mother and baby is not perfect,” says Dr Saxon. “This means she could make antibodies for the next pregnancy.”

If this sounds alarmist or interpreted as ‘medicalising’ pregnancy, then the consequences of HDN should temper this stance.

“If antibodies attack the foetal red blood cells then it is life threatening for the baby,” warns Dr Saxon. “They may be born profoundly anaemic or swollen due to heart failure, or they may be jaundiced which is a threat to the baby’s brain if it is not managed properly.”

In some cases babies with HDN who are less than 72 hours old require a blood transfusion. Serious cases require a complete exchange transfusion, while some babies need a blood transfusion before they are born.

“Women should find out what their blood group is, but it is done with their consent as a routine part of the first ante-natal blood test which includes screening for antibodies,” Ms Hermann says. “They are also screened for antibodies later in the pregnancy.”

Once the baby is safely delivered, a simple blood test can detect if there are any anti-D antibodies left in the mother’s system.

“HDN is not an old-time disease,” cautions Ms Hermann. “It should be treated with respect and carefully monitored to avoid the profound implications it can have on a baby’s health.”

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Here's an interesting scenario. Pam had a melanoma removed by a surgeon, and instead of sending it to a pathology laboratory where a pathologist would examine the specimen and report what type of melanoma it was, she decided to take it home and work this out for herself. Pam bought a home-testing kit, and the manufacturers promised she would be 100 percent satisfied with the results or she could have her money back.

In fact, there is no such thing as a melanoma home-testing kit, and Pam is also fictional, but this scenario is not as far-fetched as it appears. There is an emerging stream of self-testing kits for serious conditions such as stomach ulcers, cholesterol<sup>1</sup>, urinary tract infections and prostate cancer<sup>2</sup> that should be approached with care. But how do consumers work out which tests are valid and which are not?

Associate Professor Peter Stewart, Director of Pathology at Sydney South West Area Health Service (SSWAHS), says caution is needed when looking at tests offered outside of accredited laboratories.

“Consumers need to understand the strengths and weaknesses of the test, look at the clinical,

diagnostic and analytical validity and look at the principles behind how the test is assessed,” he advises. “Valid tests must have an established validity and be an analytical test with an established reference range.”

If this sounds complicated then there’s a good reason. It takes a minimum of 13 years to become a pathologist, and even then new medical discoveries and evolving technologies mean pathologists continue learning about the causes of diseases and the ways they affect our bodies. Furthermore, it’s not enough to view the ‘result’ as an isolated number. For example, a blood haemoglobin level of 104g/L in a 66 year-old male could mean bowel cancer, while the same result in a 57 year-old woman could indicate a vitamin B12 deficiency. That’s why the medical interpretation of a result is important.

It’s not only self-testing kits that require care when interpreting the results. Tests offered outside of accredited laboratories should also be approached with caution. One example is a live blood analysis.

“Live blood analysis is where the pattern of red cells under a microscope is used to diagnosis various conditions such as lupus or cancer. It should be approached cautiously because it doesn’t meet the criteria of established clinical, diagnostic and analytical scientific validity,” says A/Prof Stewart.

To help navigate the maze of tests that might be offered outside of an accredited laboratory, A/Prof Stewart suggests using this checklist:

- Is the test worth doing?
- Does it have a well-established reference range?
- Is there an analytical variation? (For example, a hair analysis result will be different based on where you live, what shampoo you use etc)
- Does it have a solid track record?
- Is the analytical side well established?

If the answers to these questions are not clear or overwhelmingly ‘no’, then it’s a case of buyer beware. And remember, it takes a great deal of training and specialist expertise to interpret pathology results, so it’s safer to stick to accredited laboratory tests and leave the interpretation of the results in the expert hands of pathologists.

## Further Information

The complex role of pathologists is explained in a range of brochures produced by the RCPA: <http://www.rcpa.edu.au/Publications/Educational/Brochures.htm>

A reliable source of information on pathology tests is Lab Tests Online: <http://www.labtestsonline.org.au>

<sup>1</sup>Cholesterol is covered in [ePathWay issue 006](#)

<sup>2</sup>Prostate cancer and the prostate specific antigen (PSA) test is covered in [ePathWay issue 006](#)

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