



# PathWay

THE ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALASIA



NOVEMBER 2012 | Published by RCPA

Issue #020

## In This Issue

- Early diagnosis equals better prognosis for testicular cancer
- The placenta may hold the key to problems in pregnancies
- Infection to death in two days means the Hendra virus doesn't horse around
- Increasing liver cancer rates depend on the domino effect

## Interesting Facts

# 35 years

The average age at testicular cancer diagnosis in 2007

## Welcome to the November edition of ePathWay

November brings forth two annual events - Movember and Spring Racing Carnivals.

Movember is responsible for sprouting moustaches on thousands of men's faces to raise vital funds and awareness for men's health. Our contribution to this great initiative is a round up of testicular cancer.

While those moustaches are growing, thousands of horses are also being transported around Australia for the Spring Racing Carnivals. With so many horses stabled together, it's a good chance to catch up on the Hendra virus which almost stopped the race that stops the nation – the Melbourne Cup.

Our pregnancy series is also continuing, this time looking at the incredible placenta thanks to our resident world expert in this field – our College President. And finally, we've looked at why liver cancer rates are rising.

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.

## Early diagnosis equals better prognosis for testicular cancer

696

The number of cases of testicular cancer diagnosed in Australia in 2008

47

The number of cases of testicular cancer diagnosed in New Zealand in 2007

Sources: Cancer Australia, Testicular Cancer website sponsored by the Prostate Cancer Foundation of NZ

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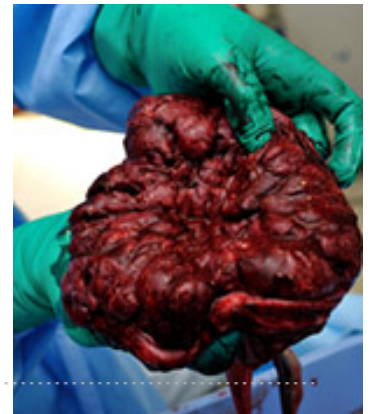
Testicular cancer probably rates very highly as an uncomfortable topic for men. But we should discuss it because it's Movember and men's health is front and centre. To get the ball rolling we've gone to an expert for the facts on this serious form of cancer.

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## The placenta may hold the key to problems in pregnancies

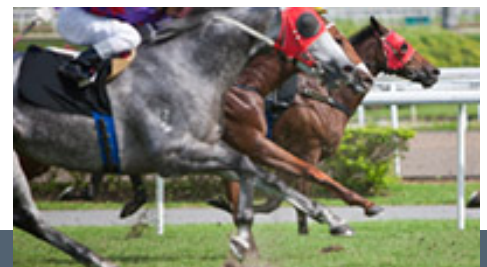
When a baby is delivered he or she is the star of the show and all eyes are focused on this small miracle of birth. Well, almost all eyes. The medical team are also interested in the placenta which comes out after the bub (since its job is over). If it doesn't look normal, or there was a medical problem with the baby or the mother, they will often send the placenta to a Pathologist for further investigation.

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## Infection to death in two days means the Hendra virus doesn't horse around

The Melbourne Cup might be the race that stops the nation, but the Hendra virus is the disease that stops the horses. An outbreak threatened to stop this famous event in 1994, so it's time to find out what has happened since then.



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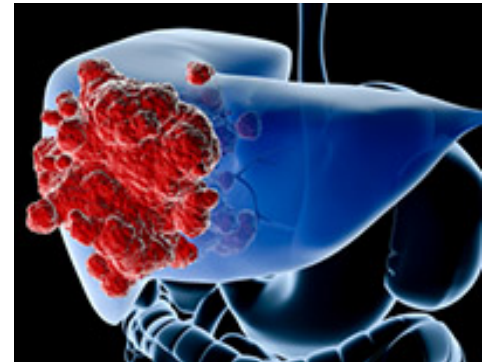
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## Increasing liver cancer rates depend on the domino effect

The incidence of liver cancer is rising and expected to double by 2020, with the increasing prevalence of viral hepatitis infections<sup>[1]</sup> nailed as the main culprit. Infection with hepatitis B and C virus is the most important risk factor for liver cancer, which means understanding how and why this happens is important.

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**Pathology gives life's most important answers.**



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## Previous Editions



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ISSUE #019

### IN THIS ISSUE

- The A, B and C of hepatitis viruses
- You must compare apples with apples when looking at pathology test results
- Drug screening not just the domain of elite athletes
- Antenatal screening tests support women's greatest hopes

### Welcome to the October edition of ePathWay

Life is full of checks and balances and three articles this month are no exception. They include checking the units of measure - and all of the 'other bits' - when researching pathology test results, occupational drug checks that occur in workplaces everywhere, and the checks offered to women during a healthy pregnancy.

The fourth article gives a brief round up of three different hepatitis viruses, known simply as A, B and C, which are still causing grief around the world. One of these viruses has

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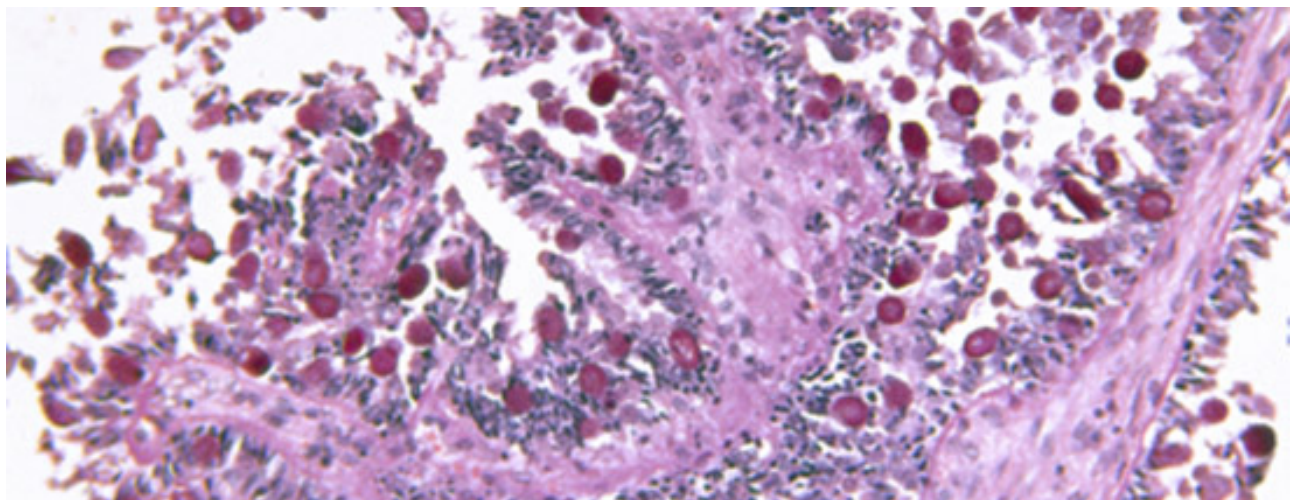
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## Early diagnosis equals better prognosis for testicular cancer



Testicular cancer probably rates very highly as an uncomfortable topic for men. But we should discuss it because it's Movember and men's health is front and centre. To get the ball rolling we've gone to an expert for the facts on this serious form of cancer.

Professor Warick Delprado, Director of Anatomical Pathology at Douglass Hanly Moir Pathology in Sydney, says testicular cancer is not a common cancer, but it is not rare either. For example, it accounts for about 1.1 percent (696) of all cancers in men (in Australia in 2008) and was responsible for 26 deaths in Australia in 2007. So what are the warning signs?

"Most cases start as non-painful lesions or swelling, and occasionally men find blood in their semen or urine," explains Prof Delprado. "Having said that, they can experience pain or discomfort, and if men find a lump or mass they must have it investigated. Early diagnosis equals better prognosis."

Prof Delprado says not all lumps are malignancies and can be due to inflammation or benign tumours. There are also two specific age brackets where testicular cancer strikes.

"It has a bimodal pattern where it peaks in the 20s to 30s age bracket and then again in the 70s," he explains. "There are also different types of testicular cancer which are related to age."

The most common testicular cancers in the younger age bracket are germ cell malignancies. These arise in the cells that make sperm and can lead to about six different types of cancer. Prof Delprado says they are often very nasty types of

cancers but respond well to radiotherapy and chemotherapy. Men in their 70s usually present with lymphoma of the testes.

Diagnosing testicular cancer takes expertise. There are blood tests for specific tumour markers for some types of cancers, but biopsies are rare. This is because they carry the risk of spreading tumour cells throughout the scrotum. The preferred method of diagnosis is therefore an ultrasound of the testes, and if that reveals a suspicious mass then the testis is removed in an operation called an orchidectomy. In other words, mass equals removal!

“Once the testis is removed they are sent to an Anatomical Pathologist to examine the tissue and advise the Urologist and Oncologist what the actual classification of the tumour is for targeted therapy,” explains Prof Delprado. “Pathologists basically perform the diagnosis, advise the prognosis and guide the therapy.”

While men's health issues are particularly highlighted this Movember, they should be front and centre all year round. Cancers don't follow social marketing campaigns, and the more discussions that happen about all cancers, even the embarrassing ones, the better the outcome will be for everyone.

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## The placenta may hold the key to problems in pregnancies



When a baby is delivered he or she is the star of the show and all eyes are focused on this small miracle of birth. Well, almost all eyes. The medical team are also interested in the placenta which comes out after the bub (since its job is over). If it doesn't look normal, or there was a medical problem with the baby or the mother, they will often send the placenta to a Pathologist for further investigation.

The placenta is an organ that connects the developing fetus to the wall of the uterus via the umbilical cord. Its job is to provide nutrients and oxygen to the fetus so it can grow, and to also remove its waste products. It is usually about 22cms long, 2-2.5cms thick and weighs about 500 grams.

While most pregnancies result in healthy babies <sup>[1]</sup>, Professor Yee Khong, Anatomical Pathologist with South Australia Pathology at the Women's and Children's Hospital, Adelaide, and President of the Royal College of Pathologists of Australasia (RCPA), says the placenta is usually examined if there are any problems with the pregnancy or the baby.

"There are three broad reasons for examining the placenta: maternal reasons such as high blood pressure or preeclampsia, fetal indications such as a small baby, and placental reasons such as a placenta that looks abnormal on delivery."

He says Pathologists examine the placenta for a number of reasons including:

- \* to explain an adverse outcome in pregnancy such as a stillbirth
- \* to provide a prognosis for the next pregnancy such as possible complications
- \* to provide information in case of any medico legal issues that may arise.

Prof Khong says the most common problems with the placenta include placental insufficiency, inflammation and vascular diseases of the fetal circulation.

“Placental insufficiency occurs when there is an impaired blood supply to the fetus which can lead to problems such as intrauterine growth restriction (IUGR),” explains Prof Khong. “Inflammation may be due to an infectious process such as acute chorioamnionitis, or due to an unknown process such as chronic villitis. It can also be due to an immunological phenomenon where the mother’s and fetus’ immune cells basically attack each other.”

Vascular diseases of the fetal circulation means something has interfered with the fetus’ blood supply. For example, the fetus may inherit thrombophilia genes from both parents which increases the risk of developing a blood clot in the placenta. This clot can block the blood supply to the fetus causing problems such as cerebral palsy.

While problems with the placenta can have devastating consequences, Prof Khong says it is also a very interesting organ.

“It is made up of half of the mother’s and half of the father’s genetic material so it is basically a tissue graft inside the mother’s body. This makes it very interesting for immunological research.”

He says the process of creating a blood supply from the placenta to the mother means fetal cells are basically ‘invading’ the womb. This has similarities with invading cancer cells making this a process of interest to cancer researchers.

“The placenta also has a finite life clock. Some last for 30 weeks, others for 42, so people who study longevity are also interested in this amazing organ.”

Once you know how important this temporary organ is, it’s obvious why the medical team are interested in the placenta. It nourished the baby for the term of the pregnancy, and may hold the key if anything went wrong.

[1] Healthy pregnancies is covered in [ePathWay Issue #019](#)

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## Infection to death in two days means the Hendra virus doesn't horse around



The Melbourne Cup might be the race that stops the nation, but the Hendra virus is the disease that stops the horses. An outbreak threatened to stop this famous event in 1994, so it's time to find out what has happened since then.

Associate Professor Geoffrey Playford, a Clinical Microbiologist and the Director of Infectious Diseases at the Princess Alexandra Hospital, says there are four main species of bats that carry this virus, and their colonies are spread all along the east coast of Australia and across the top end.

"Bat colonies are usually about 40 to 50 percent infected with this virus, but they don't develop the disease and hence remain well during the infection," he explains.

"The virus spills over from bats to horses when they are grazing under trees where bats are present and are being exposed to infectious material such as bat faeces, urine, fruit covered with bat saliva and placental tissue that may have fallen onto the grass that the horses are grazing."

While the bats might feel well, horses infected with the Hendra virus rapidly progress from illness to death in about two days.

A/Prof Playford says the horses display signs of encephalitis (an infection in the brain) such as unsteadiness on their feet, respiratory symptoms such as shortness of breath and a high respiratory rate, and a frothy discharge from the nose and mouth.

The virus was first recognised in September 1994 when a prominent Queensland horse trainer, his stable hand and most of his horses suddenly became ill with a mysterious disease. Within days, the horse trainer and 14 horses were dead.

The mysterious disease was labeled the Hendra virus after the Brisbane suburb where this first outbreak occurred. It soon became clear that the virus spreads from horse to horse via the respiratory route, which made horses stabled together particularly vulnerable targets.

Since that first outbreak, A/Prof Playford says seven humans have become infected and four have died. The common element among these cases is close contact with an infected horse such as performing autopsies or giving them treatment without protective equipment such as a mask, gloves and gown.

"The Hendra virus is not easily transmitted and you need to have close contact without precautions with infected horses in order to become infected," says A/Prof Playford.

Diagnosis of this virus is with a special test called a PCR to detect the RNA of the virus. This can be performed on any biological material such as blood, urine or tissue. There is also a blood test to detect the virus' antibodies, and other developments are in the pipeline.

"A vaccine for horses was released this month, and we are working on a post exposure antibody therapy to prevent people exposed to this virus developing the infection."

These are welcome developments because the virus has killed 81 horses, with an unprecedented spike last year of 18 horses affected, and has the potential to spread to humans. So while race goers are protected in the stands, a safe bet during this spring carnival season is that the horses are being closely monitored behind the scenes - especially if they come from 'bat' territory.

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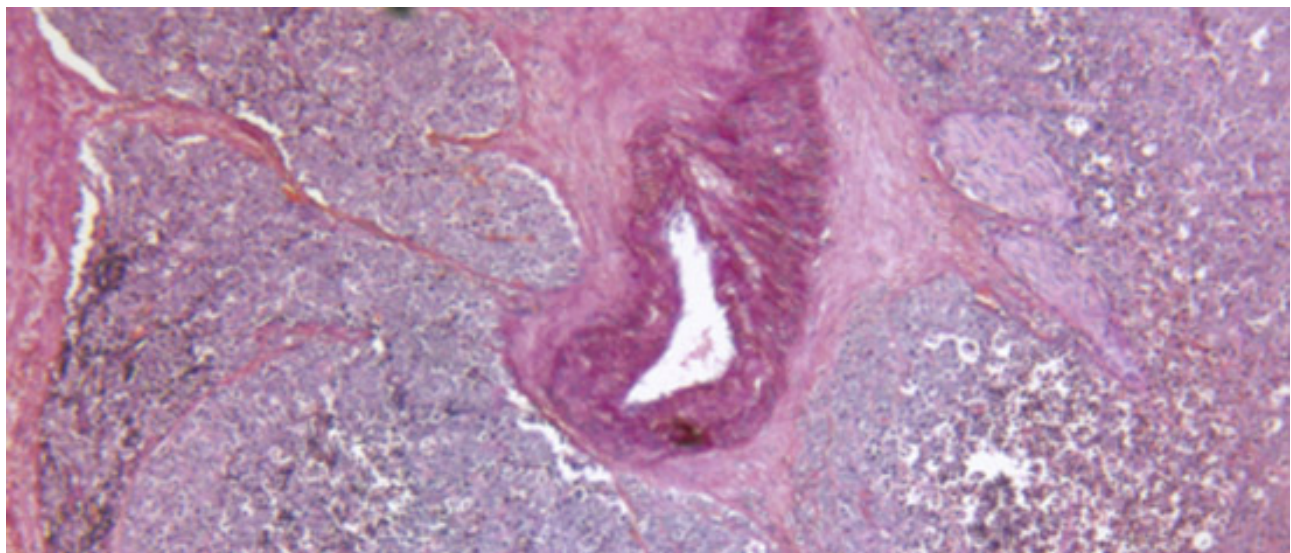
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## Increasing liver cancer rates depend on the domino effect



The incidence of liver cancer is rising and expected to double by 2020, with the increasing prevalence of viral hepatitis infections<sup>[1]</sup> nailed as the main culprit. Infection with hepatitis B and C virus is the most important risk factor for liver cancer, which means understanding how and why this happens is important.

Clinical Professor James Kench, Anatomical Pathologist at the Royal Prince Alfred Hospital in Sydney, says the rising incidence of liver cancer, or hepatocellular cancer (HCC) as it's known in medical terms, is probably in response to the increasing number of people with chronic hepatitis B (HBV) and C (HCV) viral infections.

"There was a large increase in the number of hepatitis C cases in the 1980s and 1990s and we are now seeing the effects of that," he explains. "The incidence of hepatitis B also increased in western countries up to the early 2000s."

Prof Kench says HBV and HCV infections are typically present for many years, or even decades, before HCC develops, and the infection can contribute to this either directly or indirectly.

The direct route is when the virus intrinsically causes genetic aberrations leading to cells becoming cancerous. The indirect route involves a number of steps, with cycles of cell injury, repair and regeneration leading to an increased risk of genetic changes.

"About 75 percent of people with acute hepatitis C infections, and five to 10 percent of people with hepatitis B infections, will develop chronic liver disease. This disease will grumble on for a number of years with 25 to 30 percent developing cirrhosis which is an irreversible scarring of the liver," explains Prof Kench.

"Once they develop cirrhosis there is increased cell turnover in the liver which means there are more chances for cancer cells to develop, potentially leading to HCC."

Diagnosing HCC is also a changing landscape. Prof Kench says in the past most of these cancers were clinically silent until they were at an advanced stage, with many only diagnosed during an autopsy. Now at risk people, especially those with cirrhosis, are monitored with blood tests for tumour markers, as well as ultrasound and radiology scans to check for suspicious liver nodules. Borderline cases usually have a fine needle aspirate or a core biopsy performed on their liver nodule and these samples are sent to a Pathologist.

"We put all of the information together from all of the tests and make the diagnosis which then guides the treatment," says Prof Kench.

Although the prediction that liver cancer rates will double by 2020 is sobering, it's not a done deal. If the tide of HBV and HCV infections can be curtailed, and at risk people checked regularly, then the domino effect of these viruses leading to HCC might also be derailed. Understanding how this process happens is the first part of this journey.

[1] Hepatitis infections are covered in [ePathWay Issue #019](#)

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