



PathWay

THE ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALASIA



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Issue #050

In This Issue

- Coning rule makes pathologists pro-bono champs
- Proteomics billed as a major-micro-revolution
- Age becomes a principal risk factor for cardiovascular events after 75 years
- Haemolytic anaemia has some memorable causes

Interesting Facts

3

The maximum number of pathology tests paid for by the Medicare Benefits Schedule (MBS) in Australia under an episode cone, no matter how many tests are requested.

Welcome to the August edition of ePathWay

'Coning' is a Medicare payment rule introduced in Australia in 1992 to limit health care spending on pathology. It has passed its used-by date. We spoke to Dr Michael Harrison, CEO of Sullivan Nicolaides Pathology, about coning and its impact on pathology testing.

You may not have heard of proteomics (yet!) but it's the new kid on the block and shaping up to rival the genetics juggernaut in its impact on medicine. We explain why.

On the [Choosing Wisely Australia](#) website, our College included routinely testing and treating hyperlipidaemia in people with a limited life expectancy as a test that clinicians and consumers should question. We asked an expert why.

We also look at the curious causes of haemolytic anaemia, which include bongo drumming!

Make sure you keep checking in to our [Facebook](#) page. You can follow our CEO Dr Debra Graves ([@DebraJGraves](#)) or the College ([@PathologyRCPA](#)) on Twitter to keep up to date with pathology news.

Coning rule makes pathologists pro-bono champs

1992

The year coning was introduced in Australia.

More than 20%

The estimated number of rebateable tests provided free of charge by Australian pathology labs under coning regulations.

Source: RCPA

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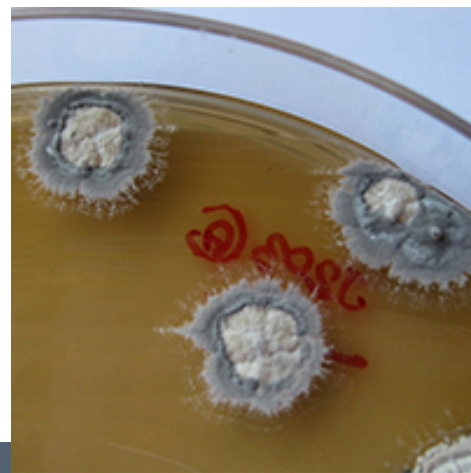


Thousands of pathology tests are performed free-of-charge every day in Australia courtesy of a Medicare payment rule called 'coning'. Introduced in 1992 by the Australian Government, coning means Medicare only pays for the three most expensive test items requested in one pathology collection episode, and the rest are 'coned out' or receive no payment. But the changing health healthcare landscape means the coning payment rule has passed its use-by date.

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Proteomics billed as a major-micro-revolution

Have you heard of proteomics or had a sample sent to a pathology lab recently for microbiological testing? Then the chances are you've benefited from this new technique for diagnosis and treatment. It's viewed as the link between genes, proteins and disease, and is poised to transform medicine – again!



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Age becomes a principal risk factor for cardiovascular events after 75 years

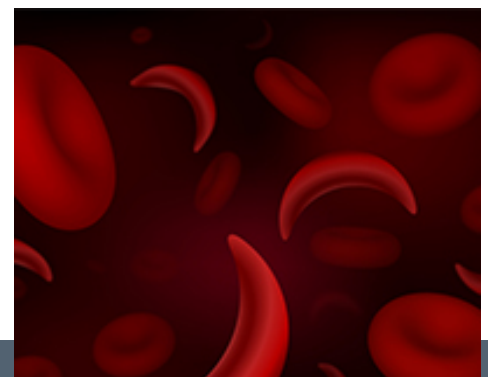
High levels of lipids (fats) in the blood (hyperlipidaemia) increase a person's risk of developing cardiovascular disease. But there comes an age when measuring a person's lipid levels with a view to preventing premature cardiovascular disease no longer makes clinical sense. Associate Professor David Sullivan, chemical pathologist and physician at the Royal Prince Alfred Hospital in Sydney, explains why.



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Haemolytic anaemia has some memorable causes

You have probably heard of anaemia (low red blood cells in the blood stream), but did you know there are more than 400 causes of this condition? We would need several textbooks' worth of writing to explain them all, so we targeted one type called haemolytic anaemia. And when you find out about some of its causes, you may regard bongo drumming as an extreme sport!





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Previous Editions



2015

[044 - February 2015](#)[045 - March 2015](#)[046 - April 2015](#)[047 - May 2015](#)[048 - June 2015](#)[049 - July 2015](#)

2014

[033 - February 2014](#)[034 - March 2014](#)[035 - April 2014](#)[036 - May 2014](#)[037 - June 2014](#)[038 - July 2014](#)[039 - August 2014](#)[040 - September 2014](#)[041 - October 2014](#)[042 - November 2014](#)[043 - Dec 2014/Jan 2015](#)

2013

[022 - February 2013](#)[023 - March 2013](#)[024 - April 2013](#)[025 - May 2013](#)[026 - June 2013](#)[027 - July 2013](#)[028 - August 2013](#)[029 - September 2013](#)[030 - October 2013](#)[031 - November 2013](#)[032 - Dec 2013/Jan 2014](#)

2012

[010 - Dec 2011/Jan 2012](#)[011 - February 2012](#)[012 - March 2012](#)[013 - April 2012](#)[014 - May 2012](#)[015 - June 2012](#)[016 - July 2012](#)[017 - August 2012](#)[018 - September 2012](#)[019 - October 2012](#)[020 - November 2012](#)[021 - December 2012](#)

2011

[001 - March 2011](#)[002 - April 2011](#)[003 - May 2011](#)[004 - June 2011](#)[005 - July 2011](#)[006 - August 2011](#)[007 - September 2011](#)[008 - October 2011](#)[009 - November 2011](#)[« Back to Home Page](#)

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Thousands of pathology tests are performed free-of-charge every day in Australia courtesy of a Medicare payment rule called 'coning'. Introduced in 1992 by the Australian Government, coning means Medicare only pays for the three most expensive test items requested in one pathology collection episode, and the rest are 'coned out' or receive no payment. But the changing health healthcare landscape means the coning payment rule has passed its use-by date.

Coning is limited to tests ordered by general practitioners for out-of-hospital services, but its impact on pathology labs is substantial. Dr Michael Harrison, CEO of Sullivan Nicolaides Pathology in Brisbane, estimates that more than 20% of all potentially rebateable tests are performed for free in Australia.

"Coning was introduced as part of a financial package by the government of the day in response to concerns about increasing pathology expenditure. It was a way of limiting payment to pathologists when a lot of tests were requested at the same time, but a lot of water has flowed under the bridge since then."

Dr Harrison says one issue is the increasing number of people with several serious chronic diseases (multiple morbidities) that all need investigating and monitoring, leading to more tests being requested per episode.

“A person may have a complex illness such as obesity, high blood pressure, chronic heart disease, diabetes and chronic renal failure and will need a number of pathology tests at the one time. For example, they may have 10 groups of tests requested and performed but the pathologist will only be paid for three of them. This impacts on pathology labs, and also impacts on evidence-based decision making in terms of good health planning.”

Evidence-based decisions are critical in health, yet coning skews the data. When item numbers are coned out, they don't appear in the Medicare Benefits Schedule (MBS) data because they are not counted. It's like sweeping data under the carpet – if you can't see it you can't count it!

For example, Dr Harrison says lipid-lowering drugs are the single biggest item on the Pharmaceutical Benefits Scheme (PBS) costing taxpayers more than \$1billion per year. A blood test for Total and HDL/Cholesterol monitors the effects of these drugs yet less than 30% of these tests are recorded in the Medicare database. The rest are coned out and don't appear in the statistics. This means the overall picture of testing and monitoring practices for these drugs is skewed.

“Coning impacts on some tests more than others, so that's another way the data is skewed. For example, the HbA1C test, which is critical for monitoring diabetes, is coned out half of the time. Full blood counts and a number of chemistry tests, which are all high volume tests, are coned out at about the same rate. Coning therefore provides a lop-sided picture of the testing landscape.”

Apart from the financial impact of coning on pathology labs, 23 years of lost testing data doesn't align with evidence-based decision-making. Dr Harrison says coning in its current form has passed its use-by date and it's time to look at a funding model based on current health care requirements.

“Pathologists will probably still be the pro-bono champions, but accurate data is needed for good health planning.”

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Proteomics billed as a major-micro-revolution



Have you heard of proteomics or had a sample sent to a pathology lab recently for microbiological testing? Then the chances are you've benefited from this new technique for diagnosis and treatment. It's viewed as the link between genes, proteins and disease, and is poised to transform medicine – again!

Sydney Children's Hospital microbiologist and paediatric infectious diseases physician Dr Brendan McMullan describes proteomics as a way of looking at proteins in cells. He says proteins are crucial to the structure and function of cells, and proteomics looks at the proteins (or proteome) produced by an organism at a particular time.

"Genetics looks at what genes are present that could lead to disease, while proteomics looks at the proteins which do the job of actually causing a disease. You could say they are being caught in the act of expressing themselves in a particular way at a particular point in time."

Dr McMullan says proteomics has revolutionised microbiology where some techniques for identifying pathogens hadn't changed much for 50 years.

"Pathogens were cultured on a plate then tested to see what they were through a series of biochemical tests, and this whole process could take days, especially for less common bugs," he explains.

“With proteomics, we grow the bacteria on a plate, take a bit of the colony, fire a laser at it on a MALDI-TOF MS analyser and get a result in minutes. It really is a major microbiology revolution in terms of making this type of testing faster and more accurate.”

MALDI-TOF MS stands for matrix-assisted laser desorption/ionisation-time of flight mass spectrometry, and these machines are popping up in labs everywhere doing routine diagnostic work. They have already had a positive impact on testing for bacterial infections that require a rapid turn-around time.

RCPA President Professor Peter Stewart says the proteomics revolution isn't limited to microbiology.

“Other areas where protein characterisation is making an impact includes the direct measurement of protein and peptide hormones, paraproteins and fragments in immunology and tumour markers,” he explains.

“Even now in the research environment it's possible to profile the protein patterns of individual cells and characterise the differences between normal and cancer cells. This will eventually lead to early detection of disease using proteomic patterns of body fluid samples.”

Prof Stewart says histology will also benefit from proteomics.

“Diagnosis based on proteomic signatures will complement the use of microscopes (microscopy) to look at a specimen, and will most likely help to assess therapeutic efficacy and toxicity through protein pattern changes, particularly in cancer therapy.”

While it's still early days, the genetic juggernaut gives us some insight into how far proteomics may advance diagnosing and treating disease. Dr McMullan says a future goal is to look at proteins in a sample where there may be many different organisms to diagnose disease, rather than identifying just one organism from a culture, but we're not there yet.

All we can say is watch this space as the proteomic revolution gains momentum and helps transform medicine - again.

Did you know?

The word “proteome” comes from the proteins expressed by a genome. It refers to all of the proteins produced by an organism in the same way the genome refers to the entire set of genes of an organism.

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Age becomes a principal risk factor for cardiovascular events after 75 years



High levels of lipids (fats) in the blood (hyperlipidaemia) increase a person's risk of developing cardiovascular disease. But there comes an age when measuring a person's lipid levels with a view to preventing premature cardiovascular disease no longer makes clinical sense. Associate Professor David Sullivan, chemical pathologist and physician at the Royal Prince Alfred Hospital in Sydney, explains why.

"The RCPA included routinely testing and treating hyperlipidaemia in people with a limited life expectancy as a test that clinicians and consumers should question on the [Choosing Wisely Australia](#) website," he explains.

"This is a common sense recommendation based on the intent behind cardiovascular risk factor interventions."

A/Prof Sullivan says the intent of investigating and treating high lipid levels is to prolong a person's healthy years of life by removing this risk factor for cardiovascular disease. However, he says this approach should be weighed up according to the expected number of healthy life-years left to save for a person with a limited life expectancy.

“As a physician, I wouldn’t do lipid tests and start treatment for hyperlipidaemia for people from 75 years of age unless there was a clear benefit to them within their remaining life expectancy,” he says.

The calculators used to determine absolute cardiovascular disease risk fix 75 years as the maximum age that can be included in the calculation. Absolute cardiovascular disease risk is the numerical probability of a person having a cardiovascular event, such as a heart attack or stroke, within a five-year period. Age becomes an even more predominant risk factor for cardiovascular events after 75 years.

“While 75 years is recommended as the cut off age, the decision to assess and treat hyperlipidaemia should be at the discretion of the treating physician based on a person’s biological age as well,” explains A/Prof Sullivan.

You can read more about Choosing Wisely Australia [here](#).

Choosing Wisely Australia was also covered in the [April 2015](#) and [May 2015](#) and editions of ePathWay.

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Haemolytic anaemia has some memorable causes



You have probably heard of anaemia (low red blood cells in the blood stream), but did you know there are more than 400 causes of this condition? We would need several textbooks' worth of writing to explain them all, so we targeted one type called haemolytic anaemia. And when you find out about some of its causes, you may regard bongo drumming as an extreme sport!

Associate Professor Merrole Cole-Sinclair, Head of Laboratory Haematology at St Vincent's Hospital in Melbourne, says haemolytic anaemia occurs when our red blood cells are destroyed and removed from the bloodstream at a much faster rate than usual (haemolysis), and before their normal life span of about 120 days is over.

"The body's response is for the bone marrow to produce more red blood cells to replace those that have been destroyed," she explains.

"If the bone marrow can't produce enough to meet the body's needs then the patient can develop anaemia which is called haemolytic anaemia."

Causes of haemolytic anaemia are many and can be divided into three main areas:

1. Those affecting the haemoglobin (oxygen carrying molecule in the red blood cell) such as in

- thalassaemias.
- 2. Those affecting the biochemical pathways in red blood cells such as inherited enzyme deficiencies.
- 3. Those affecting the red blood cell membrane such as mechanical haemolytic anaemia.

“Mechanical haemolytic anaemia occurs when there is direct damage to the red blood cell. It can be caused by such things as extreme heat which causes the membrane to break down, fresh water drowning causing osmotic trauma to the cell membrane, or fragmentation of the red blood cells after blood is subjected to abnormal flow in the bloodstream such as with a leaky heart valve,” explains A/Prof Cole-Sinclair.

An unusual cause of mechanical trauma includes a type of haemolytic anaemia called march haemoglobinuria which was classically described in soldiers subjected to long marches.

“March haemoglobinuria can cause dark urine indicating a breakdown in circulating red blood cells from the repetitive mechanical action of marching which bursts the cell’s membrane,” says A/Prof Cole-Sinclair.

“Modern day causes have been reported and include karate where people repeatedly bash their hands and feet on something hard, long distance running on hard surfaces in shoes that are not well-cushioned, and even bongo drumming.”

Diagnosing haemolytic anaemia includes blood and urine tests and, depending on the symptoms, bone marrow aspiration and/or biopsy. It can be inherited or acquired, and treatment depends on the type and severity.

Now we know what haemolytic anaemia is and some causes, there is still one question to answer. What happens to the contents of damaged red blood cells?

“While some of the red blood cell’s components are excreted from the body, most are recycled back into the body’s biochemical system so it’s not all wasted,” explains A/Prof Cole-Sinclair.

That seems a fitting end for cells that meet a premature death from causes that are memorable because they are so unusual.

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