



# PathWay

THE ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALASIA



Issue #004

JUNE 2011 | Published by RCPA

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- Coeliac disease: why pathology testing is important
- Pneumococcal vaccine protects young, old and vulnerable Australians
- Chlamydia and Gonorrhoea: Regular screening is easier than ever

## Interesting Facts

# 1 in 9

The risk of being diagnosed with breast cancer for women

## Welcome to the June edition of ePathWay

### ***The easy way for you to stay in touch with pathology***

*This month's articles include a behind-the-scenes look at breast cancer diagnosis, an expert's view on why it's better to be sure with coeliac disease, a round-up of chlamydia and gonorrhoea testing, and the latest news on the pneumococcal vaccine.*

*Pathologists are medically qualified doctors who specialise in the diagnosis of disease. They do this by examining tissues, blood or body fluids. As the breast cancer diagnosis article highlights, all of this work happens in the background and is mostly 'invisible' to the public, yet it has such an impact on the diagnosis and treatment options for many diseases.*

*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.*

## Behind-the-scenes look at breast cancer diagnosis by pathologists

# 1 in 767

The risk of being diagnosed with breast cancer for men

# 12,700

The average number of new cases of breast cancer diagnosed in Australia each year



One in nine Australian women will be diagnosed with breast cancer before the age of 85. Many cases are detected through the national breast-screening program, which involves having a mammogram, while other women notice a lump or change in their breast and consult their doctor. However they presented, the final diagnosis of breast cancer for all of these women will be made by a pathologist.

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## Coeliac disease: why pathology testing is important

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## Pneumococcal vaccine protects young, old and vulnerable Australians



May's Federal budget announced \$40.7



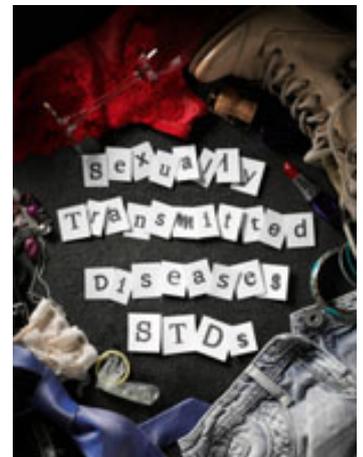
million over four years to fund a catch-up program to protect children aged up to three years-old against more strains of pneumococcal disease than were offered in the earlier childhood vaccine. This announcement followed government advice to doctors in April to suspend the second dose of a different type of

pneumococcal vaccine for the elderly due to an increased rate of adverse events. What does this all mean?

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## Chlamydia and Gonorrhoea: Regular screening is easier than ever

Chlamydia and gonorrhoea are 'delicate' subjects that don't make the cut as polite dinner conversation. But it's time to start talking because their incidence is rising, screening is simpler and less invasive than ever, and the long-term consequences of untreated infections can be very serious.



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## Behind-the-scenes look at breast cancer diagnosis by pathologists



One in nine Australian women will be diagnosed with breast cancer before the age of 85. Many cases are detected through the national breast-screening program, which involves having a mammogram, while other women notice a lump or change in their breast and consult their doctor. However they presented, the final diagnosis of breast cancer for all of these women will be made by a pathologist.

“Pathologists are involved in some way in the diagnosis of all cancer patients,” says Professor Sunil Lakhani, State Director of Anatomical Pathology in Pathology Queensland with a special interest in breast cancer. “They provide the core data on which treatment options are based.”

This core data includes the type of cancer, how big and aggressive it is and whether it has spread to other areas of the body. To make this diagnosis the pathologist needs some cells and tissue from the breast to examine on a slide under a microscope. These samples are usually collected through either a Fine Needle Aspirate (FNA) or a Needle Core Biopsy.

“The FNA involves inserting a thin needle through the skin and into the breast to suck out some cells that can be put on to a slide and examined under a microscope,” explains Professor Lakhani. “The examination takes expertise because the cells lose their orientation as to how they were arranged in the breast, so the pathologist has to interpret these cells out of their original context.”

A Needle Core Biopsy involves taking a thin core of tissue from the breast. This is examined by cutting a paper-thin section and staining this with a special dye. The cells are still arranged as they were in the breast making interpretation of any abnormality a little easier. Having tissue also allows the pathologists to carry out additional tests on difficult cases.

“Once the cells or tissue have been examined the pathologist will send a report to the doctor providing the diagnosis. This may be benign (non-cancerous), indeterminate (difficult to assess the significance of what is seen) or cancerous,” says Professor Lakhani. “If the findings are worrying or are definitely cancerous, the patient will then be referred to a surgeon.”

If the surgeon decides to operate, the excised tissue from the breast is always sent to a pathologist. They check if the margins are clear of cancer cells to ensure the whole abnormality has been excised, and will also provide a number of important pieces of information that will help the breast cancer team plan further treatment.

If the mass is a cancer, the pathologist will record the ‘type’ of cancer (even in one organ like the breast, there are many types and it is not one disease), its ‘grade’ (which depends on how closely it resembles normal tissue from the same organ) and the ‘stage’ of the cancer (the size and whether or not it has spread to the lymph nodes).

“The surgeon may also remove one or more lymph nodes from the axilla which are also examined by a pathologist to determine if the cancer cells have spread to this area,” explains Professor Lakhani. “If these nodes are involved there is an increased risk of spread to other parts of the body which will also affect the choice of further treatment. All of this information is reported back to the breast cancer team who then meet with the pathologist to discuss the future care of the patient.”

Overall, pathologists provide data that informs the long-term outlook (prognosis) for women with breast cancer, and whether the tumour is likely to respond to certain therapies. Pathology reports also provide the roadmap that determines the best treatment. Examining tissues containing cancer, and reporting on them, requires many years of training and great expertise. And since pathologists undergo at least five years of specialist training after qualifying as doctors, and continue to develop expertise in different sub-specialty areas for many more years, you could say this process is in safe hands.

[Breast Cancer Pathology Fact File](#)

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## Coeliac disease: why pathology testing is important



While the explosion of gluten free food on supermarket shelves and café menus highlights an increasing awareness of coeliac disease, there is another side to this story. It's increasingly common for people to attribute their gastrointestinal symptoms to wheat and self-diagnose coeliac disease, while many true coeliacs remain undiagnosed.

"A lot of people think they are gluten sensitive when they are not," says Dr Ian Brown, Anatomical Pathologist at Envoi Pathology and the Royal Brisbane and Women's Hospital. "They often have Irritable Bowel Syndrome or other reasons for their symptoms, but they stop eating wheat products and probably do feel better because of it. But that doesn't mean they have coeliac disease which is an autoimmune disorder that affects about one percent of the population."

There is more to diagnosing coeliac disease than just feeling better from avoiding wheat products. While there may be obvious symptoms such as feelings of discomfort, diarrhoea, abdominal pain,

bloating and (eventually) weight loss, there are also symptoms that require medical expertise to link them to coeliac disease.

“There may be neurological symptoms, osteoporosis at a young age, dermatitis, anaemia or iron deficiency,” explains Dr Brown. “In fact, more people are now being picked up with atypical presentations and unusual manifestations than just gastrointestinal symptoms. This is why it is important to get a definitive diagnosis, and that happens through pathology tests.”

Dr Brown says the gold standard test is a small bowel biopsy, while serology (blood) tests are also very accurate.

“In some cases we also need to look for a particular genetic marker,” says Dr Brown. “But, most people have the serology and biopsy to confirm if they have coeliac disease, and about 20 percent of new diagnoses are in people over 60 years of age.”

This brings us to the question of whether people are born with coeliac disease or simply develop a reaction to gluten at some point down the track. The answer is both, and once you do develop coeliac disease it's there for life.

“You need to have a genetic predisposition to coeliac disease and then an environmental influence to trigger it,” explains Dr Brown. “This influence is not clearly defined at present, but it might be a bowel infection which lets gluten into a part of the bowel it would not normally get in to. This then sets up the immune reaction.”

This immune reaction takes place in the small intestine because gluten contains big proteins that are not broken down in the stomach. It is also rich in a particular amino acid with an electro specific charge that binds very tightly to a surface receptor of special cells in the small intestine in people with a genetic predisposition to coeliac disease. This sets off an inflammatory reaction as the body reacts to this receptor-bound protein and calls in other cells to help with this process. This battle rages every time gluten is eaten.

Based on this reaction, avoiding gluten is obviously an essential part of controlling coeliac disease and a life-long dietary commitment. It therefore makes sense to have the required pathology tests to absolutely rule it in or out before such a commitment is made.

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## Pneumococcal vaccine protects young, old and vulnerable Australians



May's Federal budget announced \$40.7 million over four years to fund a catch-up program to protect children aged up to three years-old against more strains of pneumococcal disease than were offered in the earlier childhood vaccine. This announcement followed government advice to doctors in April to suspend the second dose of a different type of pneumococcal vaccine for the elderly due to an increased rate of adverse events. What does this all mean?

"Some of the serotypes not in the earlier vaccine for children have become more common and some of them are relatively antibiotic resistant," explains Professor Lyn Gilbert, Director of Public Health

Laboratory Research at the Centre for Infectious Diseases and Microbiology in Sydney. "The initial vaccine did cover the most common strains when it was first released in 2003, but pneumococcus is a very adaptable organism."

Professor Gilbert says the new vaccine, which is given to children at two, four and six months of age, has increased the number of strains it protects against from seven to 13.

"There has been an overall decrease in the rate of infections due to pneumococcus in young children but the proportion belonging to strains not covered by the earlier vaccine has increased," says Professor Gilbert. "Overall the number of cases of pneumococcus has dropped enormously, but we are now getting different strains and we hope this new vaccine will cut rates even further."

Pneumococcal disease refers to a range of illnesses that are caused by infection with the bacterium *Streptococcus pneumoniae*. Many young children carry this bacterium in their nose and throat and it can be transferred to other people through droplets of saliva or mucous when a 'carrier' spreads it by actions such as coughing, sneezing, sharing toys or kissing. When this happens it's usually only the elderly or people with weakened immune systems, or the very young, who then develop pneumococcal disease. It is also more prevalent in winter and spring.

"The number of cases is decreasing in children under five, and until the vaccine began to be used routinely in 2005 pneumococcus was the commonest cause of childhood meningitis," says Professor Gilbert. "Now it's very uncommon, which is great as it had a relatively high incidence of death and brain damage associated with it."

Professor Gilbert says there has been a positive flow-on effect of the childhood vaccination program for the elderly. She says the decreased rates of pneumococcus now seen in older people is partly due to the effectiveness of the childhood vaccine because the children are not passing it on to elderly people, such as grandparents, who they have close contact with. The elderly also have their own vaccine which has been available for many years.

Pneumovax 23 is recommended for people 65 years and over and for people with health issues such as respiratory or autoimmune diseases. It is also recommended for Aboriginal and Torres Strait Islander people from age 55. Only a limited number of doses of the vaccine are required, and they are normally given five years apart.

"This vaccine covers more strains than the one for children and was traditionally only given once, but it doesn't have the same responsiveness as the childhood vaccine so a second dose was recommended," says Professor Gilbert. "The recent report of an increase in local reactions means that the need for the second dose is being reassessed."

In the meantime, it's good to know these vaccines have had a positive impact on reducing the effects of pneumococcus now that winter has set in. Especially because the associated coughs and runny noses increase the risk of serious pneumococcal infection in those at risk, unless they are protected by vaccination.

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## Chlamydia and Gonorrhoea: Regular screening is easier than ever



Chlamydia and gonorrhoea are 'delicate' subjects that don't make the cut as polite dinner conversation. But it's time to start talking because their incidence is rising, screening is simpler and less invasive than ever, and the long-term consequences of untreated infections can be very serious.

Reports of gonorrhoea continue to rise across Australia with more than 10,000 notifications in 2010 compared to around 8000 in the previous five years. The rates of chlamydia are approximately seven times those of gonorrhoea, and notifications are also increasing. And it's not a case of 'checking for symptoms' because there are often none until the infection becomes serious. That's why regular screening is important.

"The introduction of urine-based tests and self-collected vaginal swabs has increased the acceptance of STI screening among patients and providers since it allows for routine specimen collection without a pelvic examination or penile swab," says Dr Jenny Robson, microbiologist and physician at Sullivan

Nicolaides Pathology in Brisbane. "Urine screening has also led to an increased screening of men. Almost all male collections and 60 percent of female collections are through urine tests."

The risk factors for these STIs are slightly different and often depend on the sexual history of the person. There is also a good case for testing chlamydia and gonorrhoea at the same time because they often exist as co-infections.

"Sexual health and STI clinics are able to get a very good sexual history and determine what to screen for," explains Dr Robson. "However, a GP may not be able to obtain the same in-depth history and therefore requesting both makes sense. Newer automated methods include testing for both pathogens on a single specimen and we pick up about two extra cases of gonorrhoea a week when we are conducting routine testing for chlamydia."

The consequences of these STIs remaining untreated can be very serious. In males they can both lead to inflammation near the testes, which can be very painful, while females are at risk of pelvic inflammatory disease and potential infertility. Both STIs are usually treatable by a course of antibiotics.

Dr Robson says screening for these STIs should be yearly for sexually active young adults, especially if they have multiple sexual partners, engage in sex work or drug use and have a history of repeated episodes of STIs. And since testing is now so simple and non-invasive, regular screening should be a normal part of life and banished from the list of 'do not discuss' subjects.

### ***Chlamydia is making headlines – again!***

Variants of chlamydia have reemerged worldwide in recent years, including in Australia, which cause invasive inflammatory changes of the anus and rectum, particularly in men who have sex with men. Dr Robson says these strains, including the recently detected lymphogranuloma venereum serovars, can be diagnosed through routine chlamydia testing with the collection of a rectal swab.

"Another problem pathologists face in the war against both these infections is their remarkable ability to mutate and slightly change their gene sequence so that they become invisible to 'normal' testing," says Dr Robson. "It remains a challenge to be able to detect these changes and adapt our tests so that these tricky critters don't go undetected."

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