ePathWay
THE ROYAL COLLEGE OF PATHOLOGISTS OF AUSTRALASIA

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INTERESTING FACTS

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when pneumonia occurs in individuals who are not in hospital or have been in hospital for less than 48 hours, it is referred to as Community Acquired Pneumonia.

33,794

the number of people infected with Campylobacter in Australia this year[1]

10-20 minutes

the time it takes to process a frozen section during surgery[2]

Welcome to the December issue of ePathWay

ePathway is an e-magazine designed for anyone interested in their health and wellbeing and the integral role pathology plays in the diagnosis, treatment and management of diseases.

This month's issue of *ePathway* looks at the following:

- Sending your DNA in the post – is it safe?
- What lies beneath your Christmas dinner
- Who guides the surgeon's hand
- The risks of over-diagnosing Community Acquired Pneumonia

Remember to follow us on Facebook (@TheRoyalCollegeofPathologistsofAustralasia), Twitter (@PathologyRCPA) or on Instagram (@the_rcpa). CEO, Dr Debra Graves can be followed on Twitter too (@DebraJGraves).

Sending your DNA in the post – is it safe?

100%

the percentage of interoperative consultations that should have some influence over the ongoing management of a patient.

Source:

[1] http://www9.health.gov.au/cda/source/rpt_2.cfm

[2] https://www.labtestsonline.org.au/inside-the-lab/anatomical-pathology-in-detail/frozen-sections

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PREVIOUS EDITIONS

Did you miss something from last month? You can view our previous editions at any time.

Often considered as the ideal Christmas gift, at-home DNA kits can be easily bought online, offering people the chance find out more about themselves and their ancestry by going beyond information provided by relatives or from historical documentation. We spoke to Doctor Melanie Galea to find out what these tests can tell us and if there are any risks to consider.

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What lies beneath your Christmas dinner?

Whilst it may be tempting to enjoy the Christmas dinner leftovers after returning from an afternoon down at the beach, a hidden danger lurks. Clinical Microbiologist, Dr Sally Appleton advises that precautions against food-borne illnesses should start long before even sitting down at the table, especially as summer temperatures start to rise.

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Who guides the surgeon's hand?

We speak to new RCPA president, Doctor Michael Dray, Anatomical Pathologist and Clinical Director of Laboratory Services, Waikato District Health Board, who explains the important relationship between a pathologist and a surgeon. We can't often see that behind the scenes, pathologists work away to help surgeons while they operate to provide a specific diagnosis or advise the surgeon whether or not they have removed all of a tumour.

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The risks of over diagnosing Community Acquired Pneumonia

When pneumonia occurs in individuals who are not in hospital or have been in hospital for less than 48 hours, it is referred to as Community Acquired Pneumonia. We speak to Dr Jenny Robson, Pathologist-in-Charge of Sullivan Nicolaides Pathology's Department of Microbiology and Molecular Pathology to understand more about this important cause of mortality and morbidity worldwide.

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Sending your DNA in the post – is it safe?

It's that time of year again, and many people are hitting the shops to try to find that perfect Christmas gift for friends and family. Increasingly, at-home DNA test kits are being advertised as the perfect gift idea, playing on people's natural curiosity about themselves and offering the chance to go beyond information provided by relatives or from historical documentation. We spoke to Genetic Pathologist, Doctor Melanie Galea, to understand more about what these tests can actually tell us, and what we should be aware of.

"At-home DNA tests are best described as recreational genetic tests; they are not in the diagnostic realm whatsoever. They work by looking for those variations across a patient's genome which are consistent with a particular ethnic origin. By using a specific algorithm, and by looking at combinations of variants across the entire genome, it is possible to work out what ethnic background a person has.

"Whilst the tests can deduce what ethnic origins are present in you, they cannot tell you anything about the chronology of when that happened, and they cannot tell you who your parents are. The tests will also not tell you any information about your predispositions to any conditions or be able to diagnose any conditions. They have no diagnostic implications at all," said Doctor Galea

At-home DNA kits can be easily bought online and require a small saliva sample to be sent off in the post for analysis. Within a relatively short space of time, participants will receive a link to their online test results. Whilst the tests themselves do not reveal specific relatives, some companies offer the option to search for other people in their databases who share the same DNA.

“It is important to note that pathologists are not involved in this process. The tests are provided by direct to consumer companies, and therefore are subject to different regulations than diagnostic testing. One thing to be aware of is what these companies will do with your information. Some may involve signing an agreement which says that the information gained from your DNA can be used for other purposes. This means that the company owns a copy of that information which may then be used to generate profits or can be sold onto third parties,” said Doctor Galea.

Whist at-home DNA kits like these should be used only as a light-hearted conversation starter, it is important to note that family health history is important to an individual’s personal health. Complex disorders such as heart disease, high blood pressure or certain cancers are all influenced by a combination of genetic factors, environmental conditions, and lifestyle choices. A family medical history can therefore identify people with a higher-than-usual chance of having a number of common disorders, however, should be overseen by an experienced and independent medical practitioner.

“If you are concerned about a particular genetic diagnosis in your family, then this is definitely not the test for that. The best first port of call is your medical practitioner who can refer you to a specialist in that area,” said Doctor Galea.

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What lies beneath your Christmas dinner?

Christmas dinner is often considered one of the best meals of the year, and something that many people are looking forward to. However, whilst it may be tempting to enjoy the leftovers after returning from an afternoon down at the beach, a hidden danger lurks. We speak to Dr Sally Appleton, Clinical Microbiologist at QML Pathology to find out why we need to be careful this festive season.

“Precautions should start long before even sitting down at the table, especially as summer temperatures start to rise. Most importantly, people need to ensure they wash their hands often when preparing food, and to make sure that they separate any items they are planning to cook, such as raw meats and eggs, from foods that will not be cooked such as salads and fresh fruit.

“The most common food-borne illnesses we see in Australia are infections from bacteria including Campylobacter and Salmonella, as well as viral infections such as Norovirus. Less commonly we see people become ill with Shigella, Listeria, and Shiga-Toxigenic E. coli, which are all bacterial infections, or hepatitis A viral infection. People may become unwell with gastro, when they have vomiting or diarrhoea, although some people may have more vague symptoms such as fever, headaches and lethargy. Not all people exposed to a pathogen will develop symptoms,” said Dr Appleton.

Campylobacter is most commonly found in raw chicken whilst Salmonella infections are often associated with raw eggs and raw chicken. Both can be transmitted if these raw foods are not cooked properly, or if they come into contact with items which are not then cooked, such as salad or fruit. Foods which have been left out for a long time at room temperature, particularly in an Australian summer, may also not be safe for eating. It is essential that any leftovers are refrigerated within 2 hours of cooking.

Many pathogens associated with food-borne illnesses are "notifiable", meaning that a laboratory is required to tell the public health units when an infection has been detected. Due to this, we know that there have been more than 33,000 people infected with Campylobacter in Australia this year, and more than 13,000 people who had Salmonella infections. These numbers, however, only include people who were tested in a laboratory able to identify the cause of their gastroenteritis, so the number of people affected would be higher. [1]

“Whilst many foodborne illnesses are quite unpleasant, most people will recover quickly. In some cases, however, people can become very unwell and may need to be admitted to hospital to receive fluids to rehydrate them. If the infection is severe, they may need antibiotics. This is particularly seen in very young children, in the elderly or in immunosuppressed people whose bodies are less able to cope with illness. Pregnancy can additionally place women, their unborn children, and their newborns at increased risk of complications from foodborne illness, as organisms such as Listeria can spread to the baby through the placenta,” said Dr Appleton.

“If you feel very unwell then it is always good to seek medical attention. Children and the elderly should seek help early, especially if they have been unable to drink any fluids, as they can become very unwell quickly. If someone has a high fever and is very confused or very sleepy then they need to seek urgent medical help,” said Dr Appleton.

References:

[1] http://www9.health.gov.au/cda/source/rpt_1.cfm

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Who guides the surgeon's hand?

Have you ever wondered what happens during surgery? Who guides the surgeon's hand when removing a tumour from a patient? Behind the scenes, pathologists work away to help surgeons while they operate to provide a specific diagnosis or advise the surgeon whether or not they have removed all of a tumour. We speak to new RCPA president, Doctor Michael Dray, Anatomical Pathologist and Clinical Director of Laboratory Services, Waikato District Health Board, who explains the important relationship between a pathologist and a surgeon.

"An intraoperative consultation (IC) takes place during an operation when a surgeon requests an opinion in order to guide immediate surgical management. A tissue sample will be taken from the patient, and the pathologist will need to process it, examine it under a microscope, formulate an opinion and discuss that with the surgeon, all whilst the patient is still under anaesthetic. The surgeon will then use this information to decide how best to proceed. "An IC could be unexpected or could be planned. For example, if the surgeon comes across something unexpected during surgery, then tissue will be sent off for examination. In planned circumstances, a surgeon may want to know the status of an axillary lymph node prior to considering whether to proceed with an axillary dissection, or may require the margins of a piece of skin on an area which is technically demanding to operate on, such as around the eye, a nose, or the face," said Dr Dray.

A frozen section refers to the examination of tissue which is taken intra-operatively to give the surgeon a preliminary diagnosis. Once removed, the surgical specimen is sent to the lab immediately and will be examined by a pathologist upon arrival. Instead of the usual method which involves leaving the tissue in formalin to fix for a number of hours before cutting and staining it, it will be frozen using a cryostat or liquid nitrogen. The sections then are cut, mounted and stained by the medical scientist or anatomical

pathologist. This reduces processing time from a day or two to 10 to 20 minutes, and the whole process takes place whilst the surgery is still in progress.[1]

Frozen sections performed during ICs can be used to establish the nature and extent of a lesion, to determine the status of surgical margins and to confirm that sampling of lesional tissue is sufficient for further investigations.[2] What the pathologist finds will determine whether to cut out the tumour, or to transfer the patient to a medical ward for antibiotics.

“It is technically demanding for our scientists and technicians to prepare something useful to look at. In practice, this whole process can sometimes take upwards of an hour, and that can depend on lots of different variables. For example, the tissue provided could be really difficult to process, for example fatty tissue does not freeze very well, or there may be multiple specimens to asses meaning it could take a while to process them all.

“Sometimes the pathologist has to express a degree of uncertainty about their findings so having a collegial relationship, where responsibility and authority is shared, makes it easier to say, ‘I am not sure’ and express your thoughts about being 100% certain. The relationship between the surgeon and the pathologist is therefore extremely important. Together they are a team, and 100% of those interoperative consultations should have some influence over the ongoing management of that patient,” said Dr Dray.

References:

[1] https://www.labtestsonline.org.au/inside-the-lab/anatomical-pathology-in-detail/frozen-sections

[2] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3672438/

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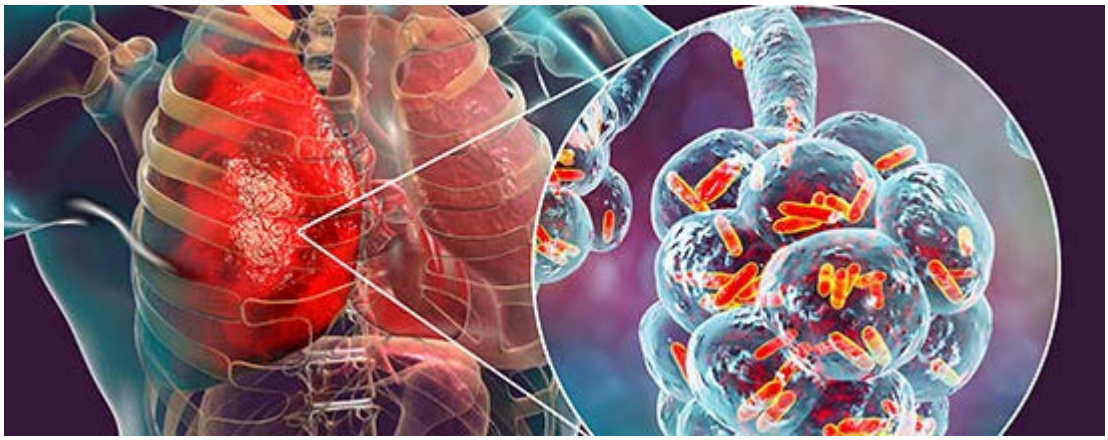
The risks of over diagnosing Community Acquired Pneumonia



Community acquired pneumonia (CAP) is one of the most common infectious disease presentations and is an important cause of mortality and morbidity worldwide.[1] We spoke with Dr Jenny Robson Pathologist-in-Charge of Sullivan Nicolaides Pathology's Department of Microbiology and Molecular Pathology to understand more.

“The infections that cause pneumonia inflame the air sacs in one or both lungs. When pneumonia occurs in individuals who are not in hospital or have been in hospital for less than 48 hours, it is referred to as CAP. Patients with CAP usually present with acute respiratory symptoms such as a cough, shortness of breath, chest pain, fever and occasionally sputum production. In some patients, symptoms may also include diarrhoea and headache or, particularly in the elderly, clinical features may be nonspecific.

“CAP is more common in older adults, but it can affect people of any age and can be very serious, especially in older adults or people with other health problems. Risk factors include, increasing age, smoking and presence of chronic diseases, such as chronic lung disease, heart disease and diabetes,” said Dr Robson.

It is important to differentiate pneumonia from other respiratory infections such as bronchitis, pharyngitis, and viral type illnesses that don’t affect the lower airways. Acute bronchitis for example usually does not require antibiotic treatment. CAP is most commonly cause by bacteria, but can also be caused by viruses, fungi, or bacteria-like organisms. Worldwide, Streptococcus pneumoniae is the bacterium that is most often responsible for CAP in adults. Whilst CAP is a common condition, it appears to be over-diagnosed and it is argued that this may be adding to the problems of overuse of

antibiotics, leading to bacterial resistance in the community and greater costs and complications in individuals. Most cases of non-severe CAP can be treated for 5 to 7 days; even 3 days may be sufficient. However, most patients with CAP are receiving much longer courses of therapy. [2]

“In this time of great concern for widespread antimicrobial resistance, it’s important not to use unnecessary broad-spectrum antibiotics. Careful assessment is required to determine the severity in all patients in order to guide the need for inpatient management and the most appropriate course and duration of antibiotics. CAP is diagnosed by putting together the symptoms and signs which can include fever, rapid respiratory rate and high pulse rate. By listening to the chest, there are often signs that suggest there is consolidation of the alveoli or air sacs which become filled up with inflammatory cells and other secretions. CAP can then be confirmed on radiology either via an X-ray or a CT scan.

“Sputum cultures or direct detection of the pathogen using polymerase chain reaction (PCR) may shed light on the cause. The latter is particularly important to detect viruses such as influenza which then often obviate the need for antibiotics or atypical and difficult to culture bacteria such as Mycoplasma pneumonia, Chlamydia and Legionella species. For individuals who are really unwell, and may require hospitalisation, two sets of blood cultures might also be taken” said Dr Robson.

Annual influenza vaccination and five-yearly pneumococcal vaccination are recommended for people with risk factors and all those aged over 65 years. For Indigenous people, who have much higher rates of CAP than the non-Indigenous population, regular influenza and pneumococcal vaccination is recommended from the age of 50. [3]

References:

[1] https://emedicine.medscape.com/article/234240-overview

[2] https://www.mja.com.au/journal/2017/206/7/controversies-diagnosis-and-management-community-acquired-pneumonia

[3] https://www.mja.com.au/journal/2002/176/7/3-community-acquired-pneumonia

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