Patient-oriented pathology reporting – time to move it forward

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The long-touted removal of the seven-day delay for patients to be able to access pathology results through My Health Record has finally occurred – with the exceptions of histopathology, cytopathology and genetic pathology tests, for which there will be a five-day delay. There have been some valid arguments against this change, including from the AMA and the Royal College of Pathologists of Australasia.

Whilst it is right that patients can access their own health information, the framing and contextualisation of results on their first presentation to the patient is generally best done by the treating doctor or clinical team. A numeric (such as a plasma concentration or cell count) or text-based (e.g. cytopathology or histopathology) report will rarely be accurately interpretable by the patient in isolation from the clinical information known by the requesting doctor.

As we all know, a result within a "normal range" does not necessarily mean there is no physiological abnormality; and a result outside that range does not necessarily indicate disease.

Nonetheless, the change has occurred; and now patients can access their pathology results in real time. The sky will not fall in, but our profession does need to consider its implications. And those of us in the specialty of pathology must think about how it affects our relationships and responsibilities with patients and clinicians.

Like all doctors, our primary responsibility has always been to patients. But unlike our clinical colleagues, most of our communication on a day-to-day basis is with our requesting doctors, rather than our patients. This will not change.

However, we now know that our patients are receiving our reports at the same time as their requesting doctors, and we know that our reports have the potential to mislead or even cause harm if read out of context. Therefore, we should consider whether there has been a change in our responsibilities.

Therefore, we should seriously consider whether a more patient-oriented style of reporting is required. This would entail patient-oriented information in a pathology report that is additional to, rather than substituting, our existing clinically oriented interpretation.

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The rationale for the removal of the seven-day delay is to empower patients to be in charge of their own information and care. This is an even stronger reason to consider patient-oriented pathology reporting, which would enable us to inform and arm patients with appropriate, accurate and relevant information to consider before their review with their clinician a few days later.

The alternative is to leave the patient to plug the clinician-oriented report into ChatGPT, and we all know how unreliable this can be. There are some reliable sources of patient information online (e.g. the non-profit Pathology Tests Explained, or PTEx, website) but they are limited by being generalised. Patient-oriented pathology reporting would fill the gap between general information and contextual clinical review.

The generation of patient-oriented reports in addition to the clinician-oriented report could be done efficiently, safely, and add real value to patient care by harnessing existing tools, including properly supervised artificial intelligence. The clinical need, patient demand and systems are all there – so the time is now. ■

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Resistance isn't useless, but antibiotic reform required

Dr Jonathan Chambers
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In November, I attended the 20th Asia Pacific Congress of Clinical Microbiology and Infection (APCCMI) in Bangkok, drawn by its focus on multidrug-resistant organisms. From lectures and discussions with colleagues from Singapore, Hong Kong, mainland China, Taiwan and Thailand, it was clear these regions face a major and escalating problem with highly resistant pathogens.

Coliforms such as *E. coli*, common causes of urinary and abdominal infections, are now resistant to all but one or two last-resort antibiotics in around half of serious infections. Treatment options exist, but are prohibitively expensive.

Traditionally, we have looked to the United States and Europe for guidance in infectious-disease management. Yet, sitting among experts from across Southeast Asia – clinicians who deal with these infections daily, and routinely use drugs that I have prescribed only once or twice – it was clear we should now be learning from them. It marks a remarkable shift: we once looked down on their health systems; now we look up to them for leadership.

Antibiotic resistance is spreading globally. Australia remains largely protected by geography and strong infection-control programs, but incursions are inevitable. I'm proud of the infection-control frameworks we've developed across Western Australian hospitals, but even the best systems can only delay – not prevent – the inevitable. Within a decade, our resistance rates may resemble those of our neighbours.

Singapore and Japan provide a preview. Both have advanced health systems, yet face substantial resistance burdens. In Singapore, about one-third of Gram-negative blood culture isolates produce Extended-Spectrum Beta-Lactamases (ESBLs), making them resistant to standard antibiotics. In Hong Kong, almost half of Gram-negative bloodstream isolates show the same trait. It's only a matter of time before we reach similar levels.

The financial implications are profound. A 35-year-old with appendicitis and a post-operative infection currently receives effective IV antibiotics costing a few hundred dollars. In 10 years, the same infection might require newer agents costing tens of thousands of dollars.

Antifungal therapy costs are equally alarming. Liposomal amphotericin, used for invasive mould infections in transplant or immunosuppressed patients, costs $2,000–$3,000 a day for up to 28 days – over $60,000 per course. These drugs are not listed on the PBS, so public-hospital patients receive them free, while private patients pay out of pocket – an obvious inequity.

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Availability adds another challenge. These infections remain relatively uncommon, so a private hospital might need drugs like ceftazidime-avibactam or cefiderocol only once every two or three months. Private pharmacies are reluctant to stock them, because they must pay upfront and discard them once expired – a major disincentive.

"Australia must rethink how it funds and stocks these indispensable medicines. The current market-based model fails both equity and preparedness. Reform is essential to ensure all Australians have access to the drugs they need, when they need them.

The UK's National Health Service has pioneered a 'Netflix-style' subscription model for antibiotics. The government pays a fixed annual fee to a pharmaceutical company for guaranteed access to high-cost anti-infectives, allowing hospitals to stock them without financial risk.[1]

Notably, Australia actually led the world in adopting a subscription-style approach: our 2015 national risk-sharing agreement for Hepatitis C antivirals provided universal access and became a global model for funding essential, high-cost medicines.[2]

New Zealand follows a similar public model: its Pharmac agency identifies essential drugs, tenders for supply, and funds them for all patients. Australia's Pharmaceutical Benefits Scheme (PBS), however, relies on pharmaceutical companies to sponsor and fund their own submissions for listing. The process is expensive, discouraging applications for low-volume or orphan drugs such as advanced antibiotics. Our strong antimicrobial-stewardship programs, while vital, further limit usage and commercial incentive. Consequently, many critical antimicrobials remain unlisted, leaving states or private patients to bear the cost.

Australia must rethink how it funds and stocks these indispensable medicines. Life-saving anti-infectives should not be treated like perishable commodities. The current market-based model – where hospitals pay per unit and carry expiry risk – fails both equity and preparedness. Reform is essential to ensure all Australians have access to the drugs they need, when they need them. ■

References available on request.

Mainstreaming of genomic testing increasing patient options

Dr Dimitar Azmanov
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There's a lot of talk right now about mainstreaming, in which all or part of the clinical genome testing process is handled by non-genetics health professionals, and there's some seminal international research being done on developing various models of delivery.

The concept is not new. Mainstreaming was originally coined in the context of cancer genomics testing in the last decade, when gene panels for breast cancer and other inherited cancer genes became available to ordering and to being integrated into clinical practice through oncology services, not necessarily through the standard of care of clinical genetic services.

Prior to the availability of mainstreaming of genomic testing, the standard of care for many years has been to have the clinical genetics team primarily responsible for the management of patients and families with heritable conditions. The involvement of the clinical genetics service has included the continuum from assessment, through decision on appropriate testing, pre-test genetic counselling, test ordering and result disclosure, to patient and family management based on the available genetic information. In the standard of care, genetic pathology laboratories have provided testing services for patients referred exclusively by the clinical genetics team.

However, two factors have changed this equation.

Number one: disruptive genomics technologies which have brought mainstreaming closer to the patients and their families, because they provide more opportunities to do genomic testing at scale or at large to bigger populations, to bigger numbers of people.

The other factor contributing to mainstreaming is that the genomics clinical workforce has been relatively steady over the years. So, the greater demand for genomic services requires the involvement of other health professionals who help and facilitate the integration of genomic testing into patient management.

This year, there have been a few seminal papers in the medical literature, mainly from Canada and the UK, on proposed frameworks for how mainstreaming could be truly integrated into practice. The Canadians, for instance, determined four different models depending on how much or how little each of the non-genetic clinicians gets involved in this whole process.

In the traditional model, they don't get involved at all. The only thing the non-genetic clinicians do is refer the patient; and everything else is managed through the genetics clinic.

The mainstreaming models have non-genetic clinicians involved, either partially or entirely, in the whole process of care delivery surrounding genomic testing performed by the genetic pathology laboratories.

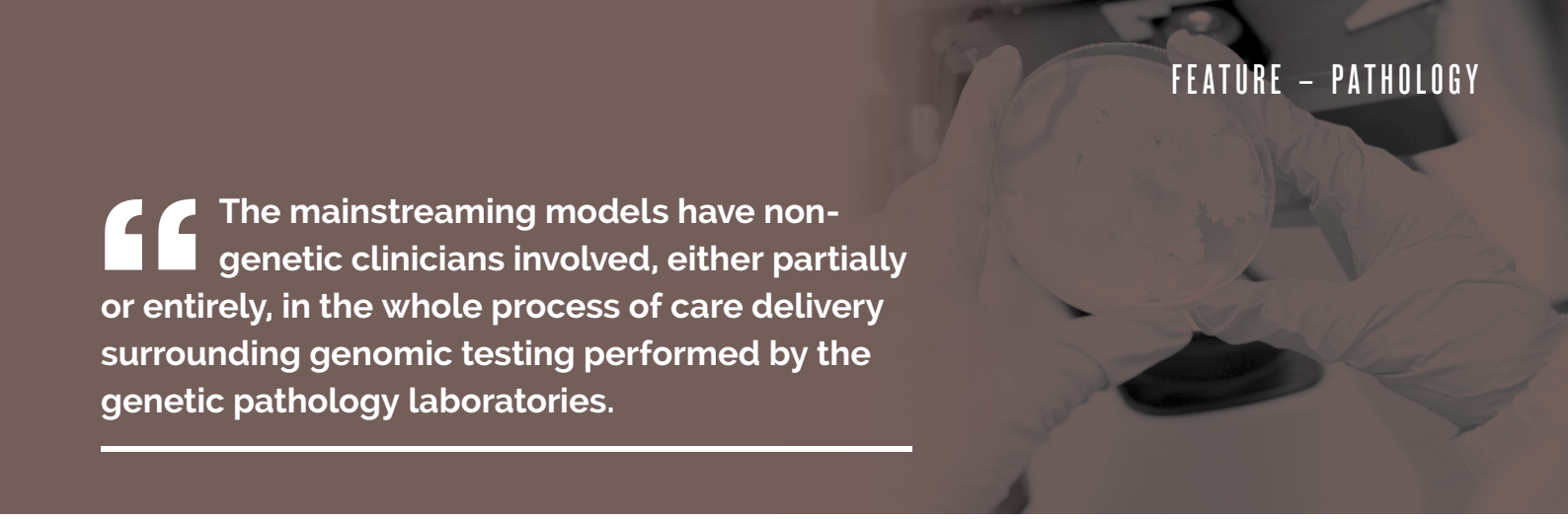
One model has the non-genetics clinician taking all the history, understanding what type of testing is required for the patient, and ordering the test – but then the involvement stops there. Everything else is maintained by the clinical genetic service.

Another model has the non-genetics clinician ordering the test, receiving the results, providing all the counselling, pre-test and post-test. However, if testing of other family members is required, then the patient is referred to the clinical genetic service for that follow-up.

I would say from my experience over the last decade or so that various degrees of these models have been integrated into practice here. However, it all depends on various other factors.

To start off with, it depends on the characteristics of the patient and the disease. If the disorder or the family history or context is complex, then the non-genetics clinicians are less likely to engage in mainstreaming of genetic/genomic testing.

If, for instance, a patient has a well-defined genetically determined kidney disease, a nephrologist may be comfortable with ordering the genetic test and not engaging clinical genetic services. Whereas, if the disorder is more complex or syndromic involving other systems (let's say eye, brain, in addition to the kidney), then they may decide it's beyond their scope and refer the patient to clinical genetic services which – by default – are well versed in complex genomic disorders.



“The mainstreaming models have non-genetic clinicians involved, either partially or entirely, in the whole process of care delivery surrounding genomic testing performed by the genetic pathology laboratories.

If a disorder has a relatively high prevalence in the general population, the likelihood of getting into mainstreaming is higher. Take *HFE*-related hemochromatosis testing, as an example. It's been around for ages, and it can be ordered by non-genetics clinicians, and the disorder has been managed well outside of the clinical genetics services.

Chromosomal testing has also been standard of care for reproductive physicians and fertility clinics, given the prevalence of chromosomal disorders.

Chromosomal microarray also became a first-line test in the context of developmental disorders and autism. And since the Medicare Benefits Schedule (MBS) update in 2013, paediatricians have been able to order the test and manage the patients based on the information from that testing. Of course, once they have received, for example, an abnormal result, those non-genetics clinicians have been referring patients to genetics clinics for further management.

Now, this leads us to the test characteristics. If a test is really complex, let's say the whole genome, then that complexity makes it less amenable to mainstreaming.

If the result is relatively straightforward – a binary result, something present or absent – then it's more likely to be understood from the broader clinical audience. However, if the result brings nuances and some uncertainty, whether it has clear implications for management or not, then mainstream clinicians may not necessarily be comfortable with engaging into integrating that type of genomic healthcare into their process.

Given that I'm a genetic pathologist, how can our specialty help this process of enabling integration of genomic testing into mainstreaming?

Education, obviously, is an integral part of our job. We're more than happy to provide advice to other health professionals, on-site or by telephone consults, regarding genomic test characteristics, the utility of a particular test, or interpreting results if there are some queries. Many of us also get involved in undergraduate or postgraduate teaching, providing the latest information on technologies and genomic testing utility.

Something very important to increase the likelihood of adopting genomic testing into mainstreaming is the accessibility of the report language. Genomics reports could be very complex, so simplifying the language is a longstanding aim; and we're striving continuously to improve our reporting to make it easily understood.

Another important factor for non-genetic colleagues for adopting genomic testing into their daily practice is how well the follow-up is reflected in the report. What recommendations are made? Are they clear? In a busy clinic, practitioners would like to have a very clear statement about what's required next.

Something else that would help other fellow practitioners is a test directory where everything about the genetic test, the indications, the referral pathway and the follow-up is available online – then everyone can access it and act accordingly.

The Federal Government is actively thinking about mainstreaming. There were at least two items directly related to mainstreaming in the MBS for November 2025. One of those is very close to my heart – because I was directly involved in the introduction of Rhesus D non-invasive prenatal testing into WA, and there are two MBS item numbers (73420 and 73421) for this testing that now allow midwives to request those item numbers. In other words, extending this test quite widely into mainstreaming, recognising the important involvement of midwives into management of Rhesus D-negative pregnant women.

Another recognition is that from 1 November 2025, MBS added DPYD (dihydropyrimidine dehydrogenase) genotyping to predict fluoropyrimidine-induced toxicity in specific cancers. Over the years, this test has been only available through private testing and prescribed mostly through oncologists. Now Medicare is fully funding this test.

Mainstreaming of genomic testing is clearly becoming a serious part of the healthcare landscape, and it is great to see more opportunities for access to genomic healthcare becoming available to patients and families with heritable conditions. ■