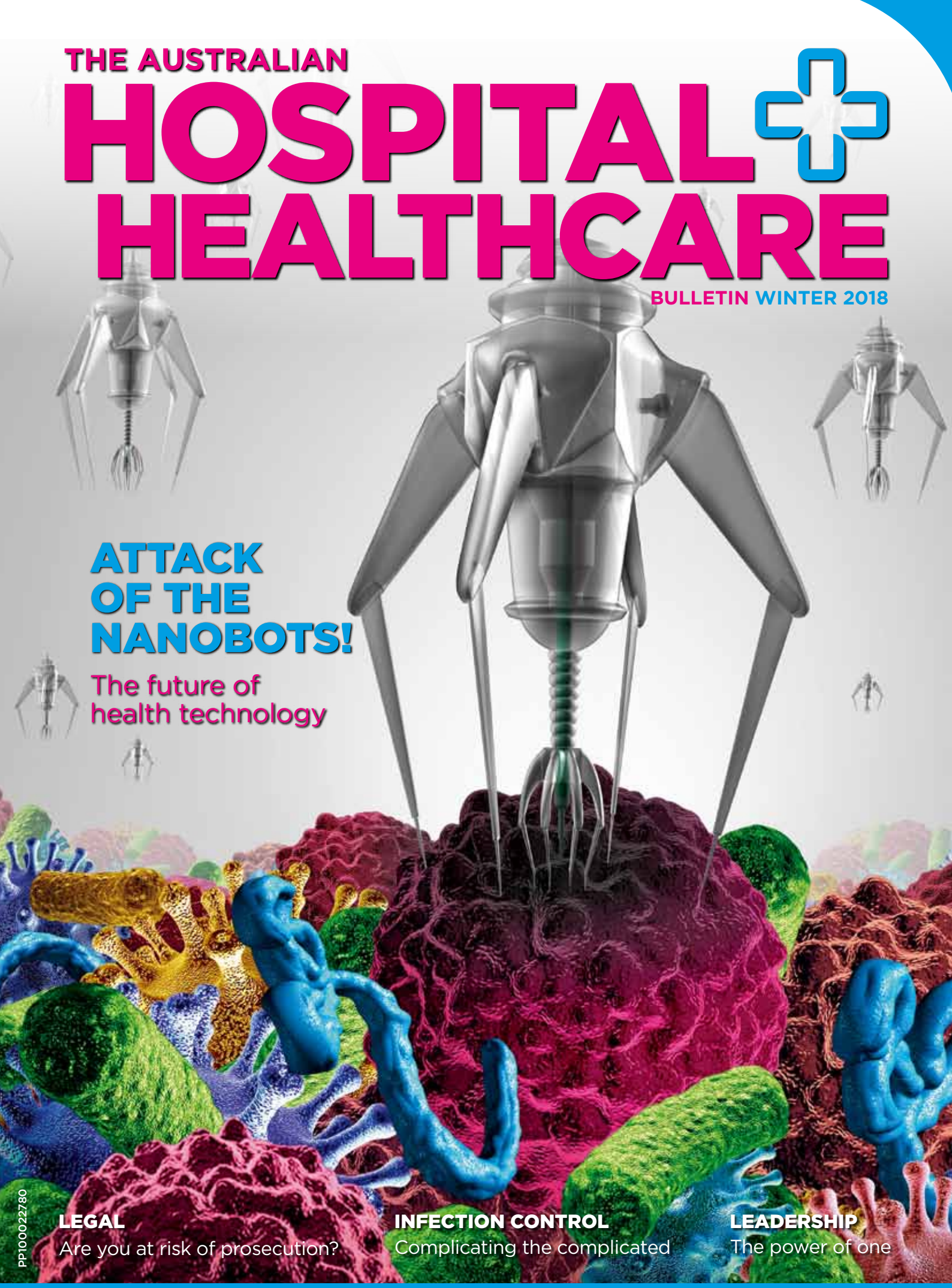
THE AUSTRALIAN

HOSPITAL HEALTHCARE

BULLETIN WINTER 2018



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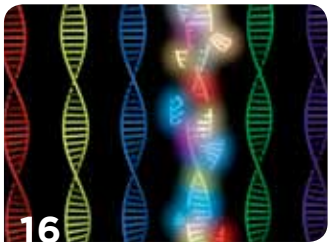
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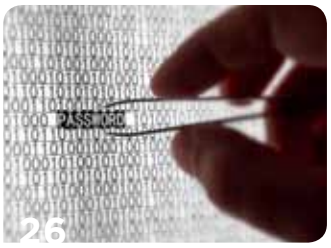
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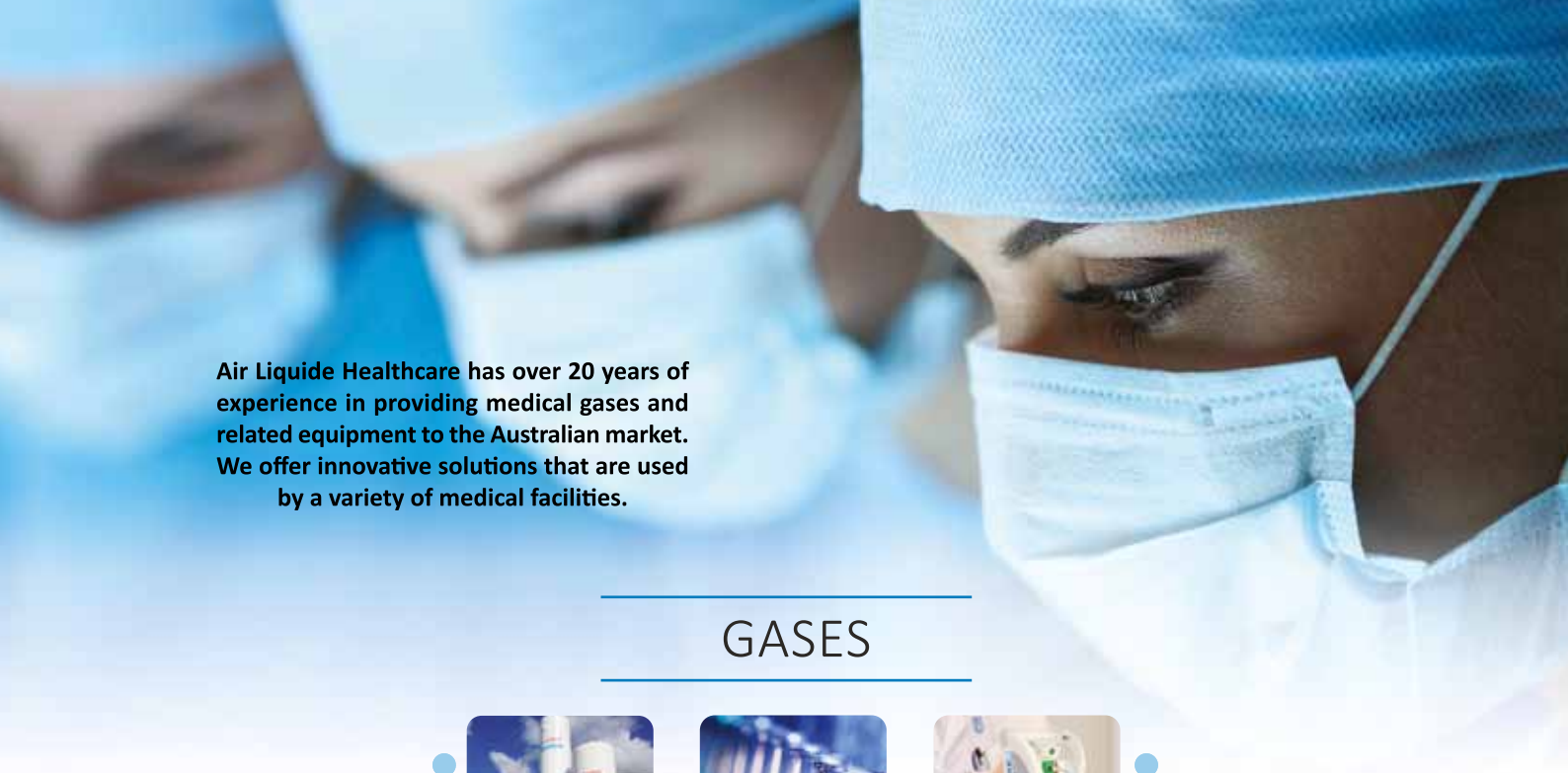

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THE FUTURE OF HEALTH

Welcome to your Winter edition

Imagine a swarm of nanobots, called 'motes', entering a patient's blood stream and attacking early cancer, or bringing pain relief to a wound. Sound like something out of a science fiction movie? In this case, the truth is more exciting than fiction — as nanobots are already a medical and and technological reality.

Intriguing technological developments in health care are explored in this issue, starting with 'The Future is at Hand', where trend forecaster Michael McQueen updates us on the latest disruptive health technology and envisages a near future where artificial intelligence has taken over half the workload of China's doctors. Certainly, genomics has been disrupted by CRISPR, so we are fortunate to have Dr Rebecca Laborde from Oracle explain the science behind CRISPR and its impact on medical discovery.

We also meet up-and-coming entrepreneurs creating innovative health technology businesses as part of the HCF Catalyst program; inspired by their own experiences, these medical professionals have used technology to positively impact health services.

Other health informatics-themed stories include:

- Australia's first digital public health service
- How vulnerability impacts the healthcare equation
- Falling down — children getting hurt while in hospital
- Digital transformation for quality and safety
- A day in the life of Chris Barakat, Business Development Director at Healthshare.

If you're in management, or seeking to move into management, then it's worth reading about the 10 leadership attributes we can learn from HESTA CEO Debby Blakey, in 'The power of one'.

While every clinician and health entity wants to do the right thing by their patients, sometimes things go wrong. 'Are you at risk of criminal prosecution?' explores the legal risk of doctors and facilities facing prosecution in Australia. Another hot topic, for hospitals in particular, is explored in 'Complicating the complicated', which outlines the risk of being incorrectly financially penalised due to Hospital Acquired Complications data on UTIs being unreliable.

This issue, we also debut our new 'Rural Health' section, with a feature on Central Queensland's ambitious plan to save 10,000 lives. I would love to hear from readers in Rural Health who have stories they want to share.

As you can see, there's a wealth of great stories in this issue, so settle in for an engaging and informative read.

Laini Bennett
Editor, AHHB
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WANT TO CONTRIBUTE?

We welcome articles and research reports from health professionals across Australia for review for the quarterly print publication and our daily web page. If you have a story you think would be of interest, please send an email to **ahhb@wfmedia.com.au**.

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The Rounds
Updates in Healthcare

Australia tops world for avoidable sports injuries

Despite being largely preventable, Australia has the highest reported rates of anterior cruciate ligament (ACL) sporting injuries and reconstructions in the world.

ACL is a sporting injury that typically leads to lifelong repercussions, including osteoarthritis. Over the past 15 years, the rate of reconstruction in Australians under 25 years of age has risen more than 70%, with the greatest increase among children under 14, according to research published in the *Medical Journal of Australia*.

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Between July 2000 and June 2015, 197,557 primary ACL reconstructions were performed, according to research leader Associate Professor Christopher Vertullo, director of Knee Research Australia and chair of the Australian Orthopaedic Association Youth Sports Injury Prevention Initiative.

"Direct hospital costs of ACL reconstruction surgery in 2014–15 were estimated to be $142 million," he said.

"The rise of ACL injury in young people has been attributed to earlier specialisation by younger athletes, longer sporting seasons, more intense training, higher level of competition and a lack of free play."

The authors emphasise that "prevention is much more cost-effective than either ACL reconstruction or rehabilitation. Establishing a national ACL injury prevention program has been reported as a cost-effective strategy for improving sporting health outcomes for young Australians.

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Some vitamin supplements unhealthy

A new study has found that some vitamin and mineral supplements may be detrimental to health, and recommends that patients adopt a balanced diet rather than rely on supplements.

Published in the *Journal of the American College of Cardiology*, the study reviewed 179 randomised controlled trials published from January 2012 to October 2017, testing the impact of supplements on developing and treating heart disease and on all-cause mortality. With the exception of folic acid for reducing stroke risk, the research found little evidence that vitamin or mineral supplements were beneficial for preventing or treating heart disease, and that some supplements could worsen health outcomes.

Researchers found that data on the four most commonly used supplements — multivitamins, vitamin D, calcium and vitamin C — showed no consistent benefit for the prevention of cardiovascular disease, myocardial infarction or stroke, nor for all-cause mortality. Folic acid alone, and B-complex vitamins in which folic acid was a component, did show a reduction in stroke; but niacin (vitamin B3) and antioxidants were associated with an increased risk of all-cause mortality.

However, Professor John Funder AC, Department of Medicine, Monash University, cautioned against "damning" Vitamin B3 entirely as it is known for its neonatal benefits.

The study has some limitations, including: the researchers did not consider data from cohort studies, which are longer and more representative of the general population than randomised clinical trials. Also, grouping many types of antioxidants may have been suboptimal since their mechanisms of action may also be very different.

No more Oakden-style 'disasters'

A new Aged Care Quality and Safety Commission is being established by the federal government to tackle failures in the aged-care industry.

The commission is a response to the Carnell-Paterson review into failures at South Australia's Oakden Older Persons Mental Health Service. The review, commissioned by the Turnbull government, found the current aged-care regulatory framework is fragmented and does not adequately provide the assurance the community expects.

Launching 1 January 2019, the commission will bring together the functions of the Australian Aged Care Quality Agency, the Aged Care Complaints Commissioner and the aged-care regulatory functions of the Department of Health.

A new Chief Clinical Advisor will provide advice to the commission, particularly on complex clinical matters.

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Additional quality reforms announced by the federal government include:

- developing options, in consultation with the aged-care sector, for a Serious Incident Response Scheme (SIRS) to ensure the right systems are in place to identify an incident and prevent it from occurring again;
- a performance rating against quality standards;
- a user-friendly provider comparison tool on the My Aged Care website.

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Ambulance Victoria fined $400K following paramedic's death

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Following the investigation into the death of a paramedic, Ambulance Victoria has been convicted and fined $400,000.

The organisation was found to have inadequately recorded and stored stocks of morphine and fentanyl.

Ambulance Victoria pleaded guilty to two charges of breaching the Occupational Health and Safety Act: one charge of failing to provide a safe working environment and one charge of failing to ensure that volunteer officers were not exposed to risks.

It was fined $200,000 on each charge in the Warrnambool Magistrates' Court.

The paramedic was the team manager with 30 years' experience, and the only employee working at the station, when he was found dead in Heywood near Portland, in January 2015.

The Court heard that both fentanyl and morphine were found in his system, and that the cause of death was mixed drug toxicity.

The Court heard that Ambulance Victoria had exposed the paramedic and volunteer officers at the station to risks to their health and safety by failing to minimise the potential for illicit access to morphine and fentanyl.

The Court was told that as a result of the incident, Ambulance Victoria had made a number of changes to the management of its drug stocks, including the implementation of a regular check of records to identify unusual ordering or administration patterns for morphine and fentanyl.

Man dies after fax to doctor goes astray

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A cancer patient may still be alive if his clinicians had not relied on 'antiquated and unreliable' fax machines to communicate his test results.

A New Zealand resident, 58-year-old Mettaloka Malinda Halwala, in Victoria for work, was found to have died from complications of the chemotherapy he was receiving for Hodgkin's lymphoma.

In an inquest into his death, Victorian Coroner Rosemary Carlin found that "prompt and effective communication of his abnormal test results may have prevented his death from this cause", and called for national communication standards.

Treatment should not have occurred

On 11 November 2015, a positron emission tomography (PET) scan suggested that Halwala may be suffering from toxicity to his chemotherapy. Despite this, two days later Halwala received another dose of chemotherapy. This occurred because the haematologist who had ordered the scan was unaware of the results.

On 16 November 2015, Halwala called the haematologist to report feeling unwell and was told to go to hospital. However, the next morning Halwala was found dead in his hotel room, fully dressed and lying on his bed.

Miscommunication

Coroner Rosemary Carlin found that the haematologist did not have a fax machine in his office, and that the nearest fax machine was shared with other offices. Further, she believed that the information was too important to have been communicated solely by fax; that the nuclear medicine physician who sent it should have confirmed that the haemotologist had received it. In fact, both doctors relied on the other to follow up if required, and neither did.

She said that while electronic distribution was a vastly superior method of communication compared to faxes, it would never be a substitute for direct, spoken communication of medical results in appropriate cases.

"It's hard to understand why such an antiquated and unreliable means of communication [such as a fax machine] persists at all in the medical profession," she wrote.

New drug tames violent patients

Queensland paramedics have identified a significantly faster and safer method of sedating violent patients, and it is attracting interest from other countries.

Following a study, Queensland paramedics have introduced a new drug, droperidol, to quickly and safely calm violent patients fuelled by alcohol and drugs.

With backing from the Emergency Medicine Foundation (EMF) Australasia, the Queensland Ambulance Service (QAS) compared the standard sedative, midazolam, with droperidol in a prehospital setting. QAS found droperidol sedated patients nearly 70% faster, was three times safer and significantly fewer patients needed additional sedation either in the ambulance or once in hospital in comparison to midazolam.

Within a week of the data being published, QAS had received requests for further information from ambulance services in the United Kingdom and New Zealand, according to QAS Executive Manager Clinical Policy Development Lachlan Parker ASM.

"Midazolam is the accepted standard internationally, but it can have significant side effects so there's been a huge gap in paramedics' ability to safely sedate violent patients," said Parker.

"Our paramedics and emergency department staff welcome the impact droperidol is having and there are some amazing stories of how quickly it works to calm really aggressive and violent patients.

"It's also simple to administer, there are much fewer side effects, it rarely over-sedates and patients wake up much nicer. We're so happy to finally have a safe drug to use."

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THE FUTURE OF HEALTH

The future is at hand

They say that the best way to predict the future is to create it. Which is exactly what is happening in the medical devices industry. Michael McQueen* explores the extraordinary technological developments in the healthcare sector.

With recent talk of driverless cars, robotic parcel delivery and AI-powered real-time language translation, it's hard even for us in the present day to conceive the impact that automation will have over the coming years. As Amara's Law tells us, while we humans can often overestimate the impact of technology in the short term, we tend to wildly underestimate its impact in the long term.

Of all the sectors that automation is set to transform in the coming years, medicine is perhaps the most exciting.

For instance, Google has recently developed a contact lens that contains a tiny glucose detector and wireless chip. These lenses can continuously monitor glucose levels in real time, making the maintenance and treatment of diabetes significantly less invasive and painful than current alternatives.

In a similar vein, Proteus Biomedical and Novartis have recently developed smart pills that monitor how the body is interacting with medications and transmit that data to your phone in real time.

New AI-powered diagnostic tools are revolutionising the detection of skin and cervical cancers in some exciting ways too. While examining Pap smear results can be time-consuming and costly, new automated imaging systems can scan samples rapidly and detect more than a hundred visual signs of cell abnormality. The computer then ranks the tests based on the likelihood of disease and, if risk factors are deemed high, passes the tests on to human pathologists to investigate further. This technology is achieving significantly more accurate results than human pathologists alone and roughly doubles the speed of processing tests.

On the treatment side, doctors have recently begun treating certain cancers with tiny robots that are temporarily inserted into the human body to release radiation.

Nanotechnology, the branch of technology that deals with the manipulation of individual atoms and molecules, is also having a significant impact on product design and functionality, with an estimated three to four nanotech products hitting the market every week. In the field of medicine, 'Smart Dust', an array of microscopic computers that can organise themselves inside the human body, can perform a wide range of functions. The applications of Smart Dust are almost unfathomable. Imagine swarms of these nanodevices, called 'motes', attacking early cancer or bringing pain relief to a wound. In the coming years, Smart Dust will enable doctors to essentially get inside your body without traditional surgical procedures at all.

*Michael McQueen is a 5-time author, trends forecaster and keynote speaker. His latest book, *How to Prepare Now for What's Next* (Wiley), examines the key disruptions that will shape the coming decade and outlines a game plan for staying one step ahead of change. For more information, visit www.michaelmcqueen.net.

The disruptive impact of medical automation

Despite all the medical possibilities that AI and nanotechnology present, there are a number of ways in which wide-scale automation will significantly disrupt the medical profession.

For instance, the primary role of medical doctors and their expertise is coming into question with the advent of IBM's Watson supercomputer. Using AI, Watson is able to give accurate medical diagnoses without human help by drawing on its encyclopaedic brain.

A new player in the space, Alibaba Health, also recently unveiled an AI service for disease diagnosis called 'Doctor You'. As an example of the power of this revolutionary technology, Doctor You can be used for medical image diagnosis of CT scans to identify early indicators of cancer.

According to Vice President of Ali Health Ke Yan, "Within the coming decade, AI will be capable of taking over half of the workload from doctors in China."

In surgical wards, automation is proving to be a game changer too. A full 40% of robots currently sold worldwide are designed for surgical purposes. Every year the number of robotic surgeries is increasing by 30% and at the time of writing more than 1 million Americans have undergone robotic surgery.

The da Vinci robot is proving to be an enduring success story in automated surgery. When I was working with a key player in the medical device sector recently, they told me that as many as 80% of prostate surgeries today are done using some form of intervention by a robotic technology such as the da Vinci.

While some in the medical fraternity caution against a reliance on robots in the operating room, the reality is that many surgical robots are able to perform procedures with greater proficiency than humans. In New Zealand, a team of surgeons recently trialled the use of a robot to carry out a procedure to remove a throat tumour. This technology resulted in a far more accurate procedure that was less invasive and therefore led to faster recovery times for patients.

It's pretty clear that medical progress is on the verge of significant change in the coming years due to AI-powered automation and robotics. Whether in a traditional operating theatre or at the most microscopic scale, these innovations will forever change the paradigm and profit models of traditional medicine. Some businesses, products and professionals will fall prey to the disruptive impact of these changes but we the patients will undoubtedly be the big winners.

THE FUTURE OF HEALTH

At the cutting edge

Since the discovery of CRISPR technology, research into genomic science and novel therapy development has exploded. Dr Rebecca Laborde* explains the science behind CRISPR and how it is encouraging research innovation.

Rapidly developing genomic technologies have become a cornerstone of modern medicine and novel therapy development. In the past two decades, they have moved from obscure research laboratories into the mainstream, making DNA testing accessible to the public.

Media coverage surrounding the genome editing technology called CRISPR (clusters of regularly interspaced short palindromic repeats — pronounced crisper) has led to strong interest from both experts and interested lay-people in its medical application and use in developing innovative technologies.

The natural origins of CRISPR

CRISPR is the popular name for a genome editing technique that has been adapted from a naturally occurring function of single-celled bacteria. Bacteria are frequently invaded by viruses that enter the bacterial cell and cause a variety of negative effects. To protect themselves, the bacteria employ an immune defence system capable of cutting the viral genome into sections and rendering it inactive.

This is possible because of a naturally occurring defence mechanism in bacteria called CRISPR and an enzyme called Cas9. The basic mechanism involves these clusters of repeated patterns within the bacterial DNA being used as a template to produce a small tag of complementary genomic material (RNA). This tag guides the bacterial Cas9 enzyme to the complementary tag on the viral genome, causing the viral DNA to be cut apart and neutralising the negative impact of the virus.

CRISPR as a genome editing technology

While researchers have been aware of CRISPR repeat regions for over 30 years, it was not until a 2007 study by Barrangou et al that their potential became clearer[1]. This group was working with *Streptococcus thermophilus*, a bacterial species commonly associated with dairy products. These experiments involved exposing the bacterial cultures to various types of viruses and then monitoring the formation of new palindromic repeat regions (CRISPR regions) into the bacterial genome.

They identified that subsequent exposure to the same virus resulted in viral genome cleavage and inactivation of the virus. Further, they demonstrated that if they removed the viral specific CRISPR region and replaced it with a different viral specific sequence, they could alter the immunity of the bacteria. This important study opened the possibility of converting this bacterial immune component into a tool for genome science.

A variety of groups began working to adapt this bacterial defence mechanism into a technology that could be applied for directed genome manipulation. A 2012 study by Jinek et al described the ability to produce an RNA molecule in the lab that complements a desired genomic sequence[2]. This custom crRNA molecule was fused to a component called a tracerRNA to produce a "guide RNA". This guide RNA allowed scientists to specifically designate the region of a genome (such as human, plant or animal DNA) that will be cleaved by the Cas9 enzyme.

Additional steps in the process for introducing DNA sequence back into the genome rely on the normal DNA repair mechanisms of the cell. This allows scientists to supply a small piece of template DNA to be copied into the area that is being repaired, resulting in the inclusion of that sequence into the genome at the location targeted.

Where is CRISPR being applied?

If you perform a web search today for "CRISPR applications" you will find more than three million results spanning wide varieties of medical treatment approaches, research applications on every species of organism imaginable and products including agricultural and genome-edited foods. The relative simplicity of the technology and reasonable cost for application has rendered this one of the most exciting developments in genome

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science. Productised solutions for applying CRISPR technology are widely available through an array of commercial providers. This is driving a rapid adoption of this technology into most genomic science programs.

The future of CRISPR technology in medicine

The benefits of targeting genome editing technology in medical research are evident both in the ability to create mutations for research purposes and the ability to remove destructive mutations or replace mutations with normal sections of genes for the clinical treatment or cure of disease. A recent review provides an overview of the areas of medical research already targeting the treatment of genetically based human diseases including cystic fibrosis, Fanoni anemia and cataract retinitis pigmentosa (RP), a genetic disorder causing retinal degradation and blindness[3].

Other areas in medicine likely to significantly benefit from CRISPR technology include cancer immunology and stem cell research and many others. Additional diseases may be targeted by preventing disease transmission such as vector control via modification of the genome for mosquito populations that harbour malaria. The options for application of CRISPR technology are diverse and we are only at the beginning of what may be possible for the future of genome science.

A bit of caution for CRISPR

We are clearly standing at the edge of a period of great discovery and advancement in medical genome science. It is expected that an increasing percentage of newly initiated clinical trials for genomics diseases in late 2018 and beyond will include a component of CRISPR derived therapy. This rapid pace of discovery and development fuelled by CRISPR merits a healthy level of caution in developing new applications. Despite recent advances to further improve the specificity of CRISPR technology[4], this technology is not guaranteed to be 100% efficient in all cases.

Variability is a key component of natural genomes and leads to the possibility of CRISPR applications having off-target effects and impacting the patient in unexpected ways. While the technology continues to improve, we must be diligent to use best practices in its application to human medicine. Additional concerns for future generations include ensuring we develop science-based standards on the logical and ethical use of this technology to treat patients and produce products.

There is a great responsibility placed on the medical and scientific community to apply these powerful tools responsibly. The public also plays an important role in having an educated understanding of the risks and potential benefits of these applications so that we may all work together to move medicine forward in this era of genomic medicine.

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*Dr Rebecca Laborde is Lead Product Strategist for Healthcare and Master Principal Scientist for Precision Medicine at Oracle Healthcare.

Exciting innovation in healthtech

THE FUTURE OF HEALTH

The next generation of healthtech entrepreneurs is developing unique and innovative products. We meet three of the finalists from this year's HCF Catalyst program.

Dr Jawahar Thomas demonstrates MEKSI.

Images: ©katrollings.com.au/lifestyle/

Left: Dr Julia Rhode and Dr Rebecca Saunderson from Consentic. Right: Dr Nish Krishnananthan explains how Vantari uses virtual reality to bring medical imagery alive.

Vantari VR

Vantari VR has developed a proprietary imaging tool that utilises virtual reality (VR) to enable new ways to visualise, interpret and understand medical images. It achieves this by pulling together cutting-edge rendering technology to take medical imaging into VR.

Vantari VR delivers value to three key groups across the healthcare value chain, including surgical planning, patient decision-making and medical education.

Inspiration for founders Dr Nishanth Krishnananthan and Dr Vijay Paul came from a deep-seated desire to make an impact, not just on individual patient lives but also on medicine and healthcare delivery as a whole.

Vantari VR can be used by surgeons for diagnostic and surgical planning purposes, allowing them to make informed and strategic decisions based on in-depth understanding and interpretation of medical imaging. Patients benefit from Vantari VR, because its ability to help clinicians decipher often complex medical diagnostic imagery assists them in making empowered decisions about their health, in conjunction with their doctor.

The app also has practical applications in medical education.

Consentic

Developed by Dr Rebecca Saunderson and Dr Julia Rhodes, Consentic's main aim is to effectively and ethically gain patient consent, which is essential for operations and other invasive procedures.

Both patients and physicians are affected by failures in the medical consent process, and issues pertaining to medical consent are one of the most common legal matters in claims against doctors. Current methods of obtaining informed patient consent have repeatedly been demonstrated to be inconsistent, inadequate and time-consuming. Assessment of patient understanding is rarely formally evaluated, and even when it is, comprehension and retention of the consent process is less than 40%.

Overwhelmingly, the medical literature supports the use of video animations when undertaking informed consent, and Consentic provides this with an interactive step-by-step guide. Consentic believes it is also the first in Australia to capture the consent process electronically, uniquely identifying the patient and linking this information electronically to their consent record.

MEKSI (Medical Knowledge Simulator)

Designed to fortify students' diagnostic skills, MEKSI was founded by Dr Jawahar Thomas and is a simulation-based online learning portal for medical students and health professionals; MEKSI facilitates consistent, high-quality medical education, giving students the opportunity to develop their skills using simulation-based learning.

Inspired by his experience working as a doctor, Dr Thomas saw a need for sound and effective patient consultation to deliver correct diagnostics and improving patient outcomes, resulting in Thomas developing and patenting the MEKSI Program.

The program allows doctors and students to participate in consultations with simulated patients to create hypothetical scenarios for students to work through in a safe environment. The patient presents with an illness and the student is tasked with providing a diagnosis and treatment plan using the knowledge they have been taught in the classroom in a practical way, helping students to develop their patient consultation skills, knowledge and attitudes, while ensuring patients aren't put in any genuine risk or harm.

Supporting start-ups

Now in its third year, the 12-week HCF Catalyst program provides finalists with mentoring, marketing advice and seed funding. Ultimately the HCF program, run in partnership with corporate start-up accelerator Slingshot, teaches finalists how to demonstrate the value of their e-health solution and make their business investor and customer ready. This year's Catalyst program culminated with a 'Demo Day', where participants showcased their business models and progress in the hope of driving interest from investors and partners.

For further information, visit hcf.com.au/catalyst.

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General Manager Compliance and Risk
The Whiddon Group

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Malcolm Passmore,
NSW Regional Operations Manager
Ramsay Health Care

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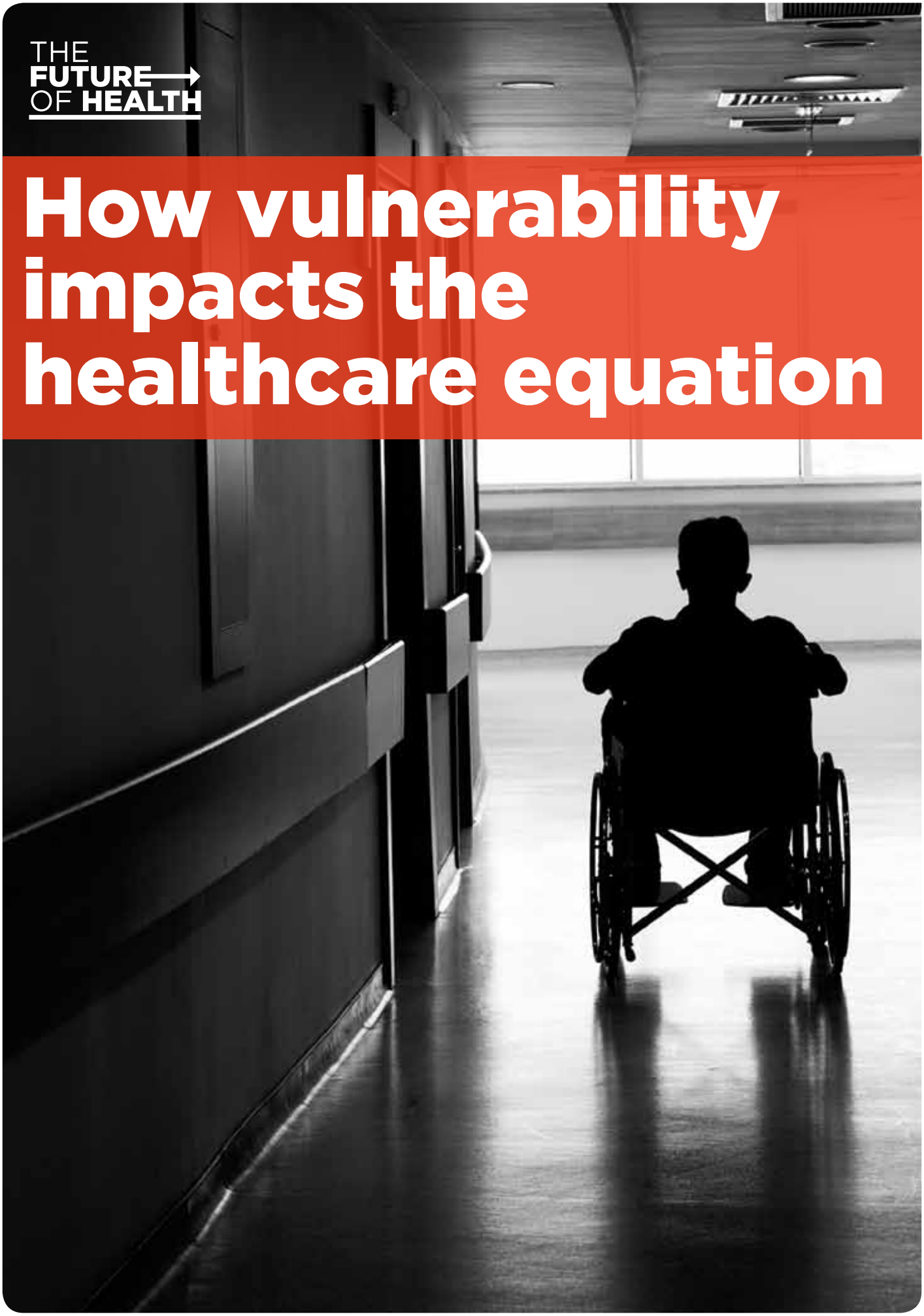
THE FUTURE OF HEALTH

How vulnerability impacts the healthcare equation



Most people are potentially vulnerable and especially so in acute healthcare environments. So who is more likely to exhibit vulnerability, and how and when does that complicate treatment and care interventions?

Defining vulnerability starts with the question: who exactly are the vulnerable in healthcare environments when, logically, almost anyone is potentially vulnerable, from families to patients to staff?

The reality is that everyone is vulnerable at some point in their lives. Understanding, and addressing, vulnerability requires a more sophisticated approach than, for example, simply labelling everyone who is elderly as 'vulnerable'.

The vulnerability research undertaken by the team at the University of Technology Sydney (UTS) takes a more dynamic approach and suggests that while everyone may be vulnerable in particular circumstances (eg, under anaesthesia), some people become vulnerable as a consequence of interactions between their own situations and the various environmental and systemic factors they encounter. This vulnerable status may also be fluid, depending on the interplay of personal and systemic factors.

This type of situation can be readily observed in patients with not only high acuity but long length of stay, or who are frequent presenters to emergency departments. But the list goes on because complexity and vulnerability often go together. The same factors apply in both, for example, in paediatrics and mental health.

The key issues are: How do we build an understanding of how situational vulnerabilities emerge in healthcare settings? What are the implications for treatment and care? How do they impact patients' (carers, families, groups, communities) access, utilisation, quality and safety, and outcomes of care, and equally importantly, how can we prevent, ameliorate or respond to these vulnerabilities?

What characterises those groups as vulnerable?

Individuals and groups who are vulnerable are usually those who exhibit complexity beyond their more obvious clinical indictors. This typically covers people whose situations might be described by 'categories' such as the frail aged, people with disabilities, those who are incarcerated, people who are homeless (to name only a few).

These categories are usually a shorthand for a wide array of events and circumstances that, while generally similar, can produce as many unique scenarios as there are individual patients. It is this kind of complexity that services have problems in accommodating and managing effectively in health and social care environments.

In other words, vulnerable patients may possess a variety of social characteristics and situations that increase their vulnerability on exposure to certain types of systems or encounters.

How do health providers identify someone who is vulnerable?

This might seem like a complicated question and on one level it is: how in amongst all of the potential and actual acuities that can happen in healthcare do we separate out and refine down those individuals most likely to become vulnerable?

This question is, in part, one of separating out probabilities. Most people are potentially vulnerable and especially so in acute healthcare environments. So who is more likely to exhibit vulnerability and how and when does that complicate treatment and care interventions?

The input side of this equation is already being identified by our research partners — largely healthcare providers — because they have been thinking about these issues for years. Most providers are clearly able to identify vulnerable groups and the characteristics which make them vulnerable. But the issue remains, how to address the vulnerabilities themselves, as well as the characteristics associated with them?

One way is to consider how descriptions of social groupings then translate to vulnerable status within the healthcare environment. This is often due to the intersection of social and clinical factors: older people are prone to falls, fractures or pneumonia; people with particular disabilities can require extra attention in case of complications arising from their conditions and their treatment; people who are homeless and/or mentally ill are frequently at risk following discharge.

Complicated patients may prove just as vulnerable, or even more so, at discharge as they were at admission. All of this tells us that context is extremely important.

Many of these groups may exhibit higher than average complication and readmission rates. This in turn has implications for their continuity of care and the associated costs to the healthcare system. Our research partners are even asking questions such as "Is it better to extend their admission now rather than risk readmitting them in a week or two?"

One of the more obvious questions is: How do we join the vulnerability dots once someone reaches the healthcare system? Can we do this in highly pressured acute care environments and, if we can do it there, can we extend the concept to the community or residential aged-care environments?

In the Spring edition of *AHHB*, we will explore how healthcare providers are identifying and mitigating complexities associated with multiple vulnerabilities. We will look at the benefits to both patients and the providers themselves.

*Hamish Robertson is a health and medical geographer with the University of Technology (UTS). He is one of a team of researchers at the Centre for Health Services Management (CHSM) at UTS examining the way intersectional vulnerabilities contribute to service provision complexities encountered on a daily basis. The project, Visualising Vulnerabilities, involves partners from several states and multiple service providers across Australia. The project team includes Professors Joanne Travaglia and Tracy Levitt-Jones, Drs Deborah Debono and Hamish Robertson, and Mr Nick Nicholas. For more information, visit www.visualisingvulnerabilities.com.

THE FUTURE OF HEALTH

Australia has a profound shortage of practising clinical informaticians, required to help transform siloed digital healthcare systems into system-wide networks.

Digital transformation for quality and safety

Dr Clair Sullivan, Amy Barnett, Michelle Winning, Lynne Wall, Dr Andrew Staib*

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Australia has a world-class health system that delivers excellent outcomes. However, traditional methods for delivering healthcare are not sustainable; demand is exceeding the capability of our system, and issues with quality and safety inflict avoidable harm and unnecessary cost.

Improving the system involves a clear articulation of the Institute for Healthcare Improvement's quadruple aim for modern health care: to improve the quality of care, the efficiency of care, population health and the experience of our patients and their carers. Achieving such complex aims is nearly impossible with traditional healthcare delivery.

Historically, health care is based on paper-based systems or siloed digital systems. These systems were deployed with the aim of delivering discrete episodes of care for individual patients and are not fit for the purpose of tackling system-wide quality improvement initiatives.

A healthcare delivery platform should be fit for the purpose of enabling data-driven decision-making to improve care at scale, and not just the delivery of discrete episodes of care to individual patients. It forms the foundation for:

- benchmarking of performance and patient outcomes using standardised digital data points collected by clinical staff as part of routine care;
- linkage of the data for each patient across the continuum of care in different healthcare settings;
- an ability to present meaningful clinical data to frontline staff and system managers in real time to enable immediate intervention to improve outcomes;
- a platform that enables new and innovative models of care, eg, virtual consults, patient portals.

These requirements can only be delivered by an integrated digital healthcare system spanning the continuum of patient care. This digital transformation of hospitals involves two components:

1. The technical rollout of an integrated electronic medical record, and integrated devices such as vital sign monitors and blood glucose monitors. This is achieved by projects heavily led by technical expertise, with clinical consultation.
2. The digital transformation of clinical care (workflows, culture and clinical governance) to leverage the digital system towards goals of quality and safety improvement of the whole system, rather than just digital delivery of individual episodes of patient care. This requires leadership by trained clinical informaticians with expertise in data-driven system improvement, digital workflow redesign, culture transformation, clinical governance and strong technical support.

Across the world, most efforts have focused on the first component; however, in order to deliver a return on investment, attention is now turning to digital transformation of clinical care rather than the simpler rollout of a software system.

Digital transformation is much more than a technical rollout and requires different skill sets for success. Technical rollout requires change management and technical expertise; however, digital transformation requires trained clinical informaticians with expertise in large-scale, system-wide quality and safety improvement and change leadership.

Australia has a profound shortage of practising clinical informaticians, particularly in digital quality and safety system improvement. National investment and development in this emerging workforce will be critical to ensure the healthcare system is futureproofed and continues to deliver evidence-based, sustainable, high-quality care for all Australians.

Co-authors*:

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*All the co-authors of this story are members of the Healthcare Innovation and Transformation Excellence Collaborative, Clinical Excellence Queensland Health.

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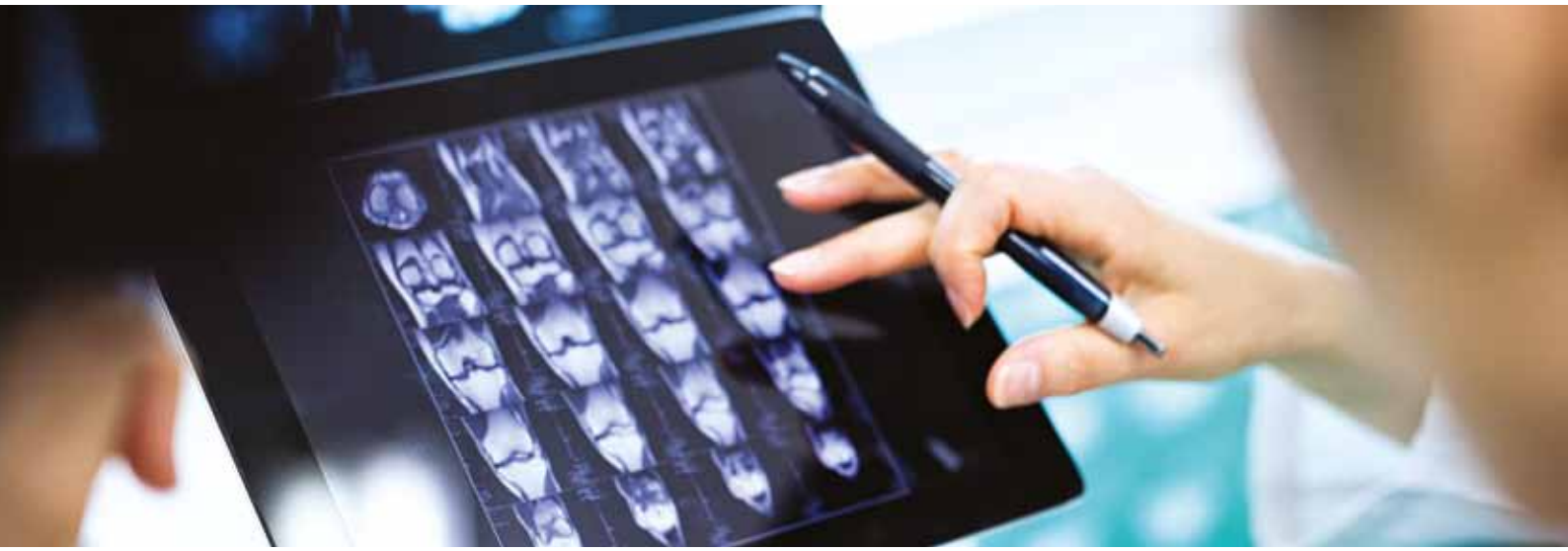

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THE FUTURE OF HEALTH

A Day in the Life

Chris Barakat is the Director of Business Development at Healthshare, a digital health company that develops products to enable greater efficiency for healthcare practitioners and tools to help patients manage their health. As part of his business development role, Barakat meets with healthcare practitioners, hospitals, health funds, pharma, medical device companies and corporates to help solve their health system issues through technology.

5:30 Wake up, check any emails that have come through overnight and head to the gym for a quick workout.

6:30 Back home to my wife and our 11-month-old son before it's time to get ready and head to work.

8:30 Meet with a specialist looking to become a customer to explain the benefits of Healthshare Referrals, our directory product that features detailed profiles of Australian specialists. The product is embedded into GP clinical software and helps generate GP referrals.

10:00 On a call with a government agency to discuss the 2017 Productivity Commission's report to confirm patients do not require a new referral letter if they want to find an alternative specialist. The agency confirms the specialist can still charge Medicare as usual.

11:00 Off to a meeting with Healthshare's CEO Rami Weiss to discuss where we're at with our new proprietary software, BetterConsult. This platform captures patient history and symptoms before they see their GP. The information is sent straight to the GP so they can spend more time diagnosing and talking to the patient about the best treatment options.

13:00 Next meeting is lunch with the Head of our Practitioners Solutions team, Rhys Staley. We discuss the latest customer feedback to ensure we're delivering what's really important to them, and note what's working well, what we can improve and the possibilities for future features.

05:30 8:00 10:00 12:00 14:00

Barakat at work on customer solutions.

Left: Barakat meeting with Rhys Staley, Head of Practitioner Solutions. Above: Barakat working with the Development team.

14:00 A sit-down with a private hospital group. We discuss how partnering with Healthshare can increase the number of GP referrals to their specialists and demonstrate how easy it is to create a profile for each of their specialists within GP software.

17:00 On the phone with a health insurer discussing solutions to help their privately insured customers find specialists that can see them quickly.

20:00 A last email check for the day and then it's time to switch off.

16:00 18:00 20:00

16:00 Time to check in with our Development team. We recently added patient ratings functionality to the specialist profiles in the referrals directory, and it's going well. We do a test search on a random specialist's name to make sure their Healthshare rating is appearing on their Google Search result.

18:00 Head home to spend some quality family time with my wife and son before we put him to bed.

Connecting the specialist dots

When it comes to finding a specialist, a Google search is not always enough. Patients want to be able to find a specialist who meets their needs, which may include their location, what language they speak, and whether they're affiliated with any hospitals. GPs face the same dilemma during consultations, and in addition may also need information about a specialist's expertise when it comes to specific subspecialties.

Healthshare's Referrals Directory is accessed by over half a million Australian patients and GPs per month. The directory lists thousands of specialist profiles, each containing:

- the specialist's name
- contact details
- medical qualifications
- practice locations
- special interests
- affiliated hospitals
- spoken languages
- pre-consultation forms.

For GPs, a benefit of this directory is that it's integrated into GP clinical software, MedicalDirector. GPs can search for a specialist from within the referral workflow and auto populate referral letters. Alternatively, they can access the directory through Healthshare's web platform.

Last year, Healthshare released a patient feedback platform enabling patients to leave feedback about their doctors' bedside manner, treatment communication and how well they felt their conditions were understood, ranking each one out of five stars. The overall rating comes up on a specialist's Google search result.

Healthshare is working with over 30 health insurers to develop solutions that help their private patients find specialists quickly to resolve their health concerns.

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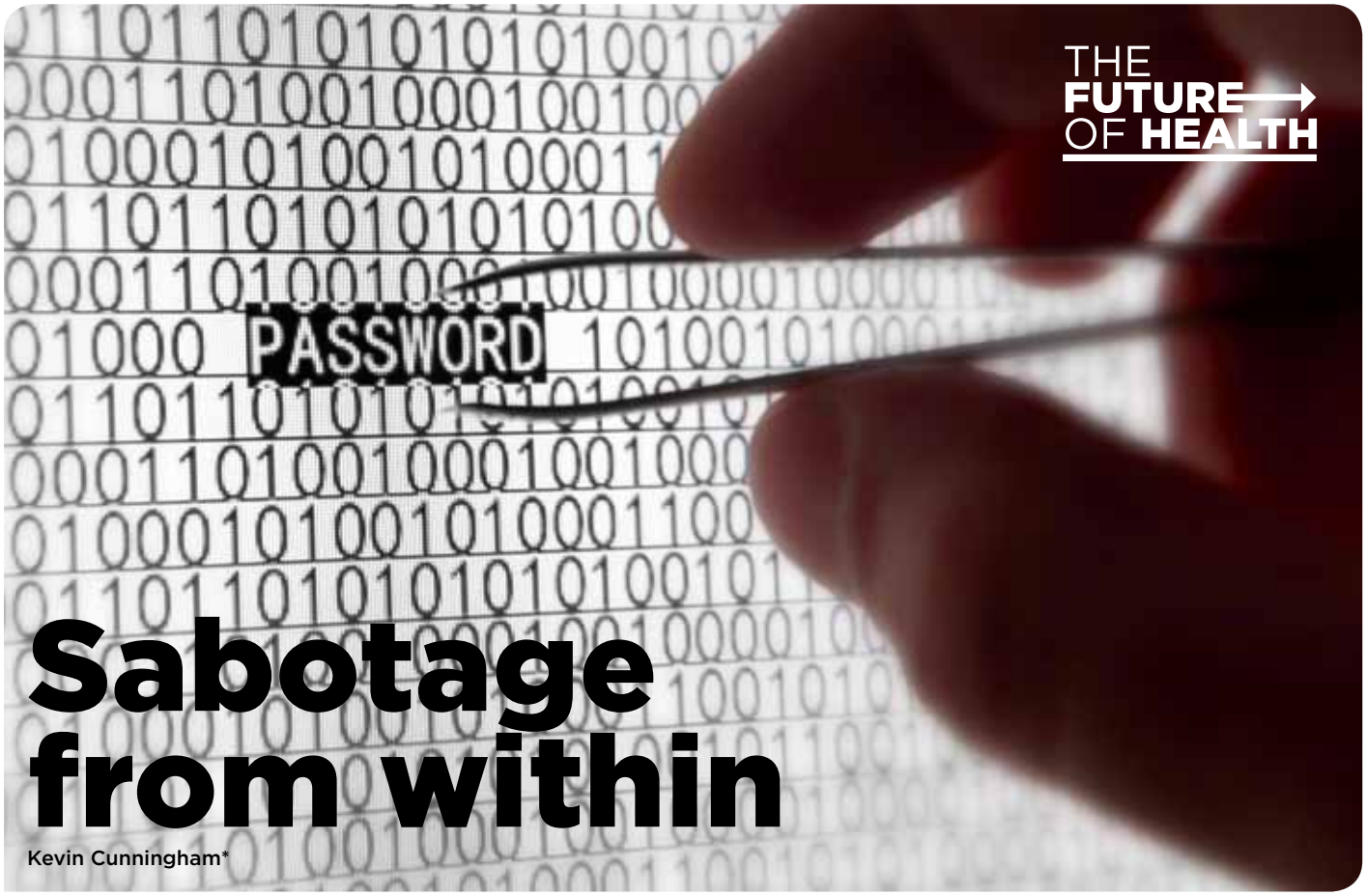
A Day in the Life is a regular column opening the door into the life of a person working in their field of healthcare. If you would like to share a day in your working life, please write to: **ahhb@wfmedia.com.au**.



Sabotage from within

Kevin Cunningham*

IT strategies that meet the bare minimum compliance regulations are not an option for healthcare organisations, or they may find themselves fending off attacks from within.

Our healthcare IT ecosystems are made up of many different and disparate technologies. On any given day, healthcare professionals use countless systems and applications that are essential to delivering patient care and safety. With sensitive patient information residing in and passing through these systems, continuity and consistency in delivering reasonable freedom of access to doctors, nurses and consultants, while avoiding the unintended exposure of patient information, is vital for the day-to-day running of any healthcare organisation.

As a result, identifying and enforcing strong access controls has become critical to healthcare organisations. Furthermore, having the right technology to execute and enforce those policies across a myriad of applications and systems residing across both on-premises and cloud IT infrastructures is paramount.

Managing disparate technologies

Healthcare organisations face a juggling act when it comes to IT and security — with compliance and regulations often a top priority. While ensuring compliance with industry regulation is vital, passing an audit does not necessarily guarantee a patient's information will be safe. This is why healthcare organisations need to address the larger security concern of employees' access to data and applications. As part of this, they must address the issues that can be encountered when using disparate IT systems. Three key considerations include:

1. Security gaps

Even small gaps in cybersecurity measures can lead to significant negative consequences. For instance, a worker's disgruntled separation from employment may have been properly reflected in the HR system. However, because the provider may utilise a number of disparate systems, the worker may not be adequately de-provisioned of access and entitlements to health data. This means that sensitive patient data is still accessible to the employee, potentially resulting in it being exposed.

2. Clinical workflow

From a workflow perspective, disparate systems and processes can also affect clinical care. For example, due to accidental oversight, a contracted doctor may be given access to the EHR, but not the enterprise content management system where scanned clinical media and photos are stored. This could be problematic, as the doctor's efforts to fully understand a patient's condition and provide timely care may be delayed.

3. Multiple authoritative sources

Many healthcare organisations have multiple authoritative data sources, such as HR and contractor management databases. These are systems and applications where user identity and access rights are most accurately defined and deemed by the organisation. However, having to manage multiple identity sources and their access rights makes it difficult to consistently execute policies and optimise resources.

Opting to meet the bare minimum compliance regulations is no longer a sufficient IT strategy for healthcare organisations. On its own, compliance cannot protect the security of sensitive patient information. It also cannot prevent interruptions to day-to-day hospital operations. A unified approach to healthcare provider identity management means incorporating all other applications and systems that are essential to provider operations — from billing to HR — to ensure that these issues don't arise.

Taking an identity governance-based approach to security allows healthcare organisations to use tools that can see into every part of the organisation, ensuring that decisions about users' entitlements are based on the right data. It serves as the 'connective tissue' that bridges these disparate systems together, giving providers a unified and centralised method to manage and enforce governing policies to ensure efficiency and drive efficacy across all systems and applications — which is essential to ongoing patient safety. It's time healthcare providers started eliminating security gaps and inefficiencies, and start talking about identity.

*Kevin Cunningham is Chief Strategy Officer and co-founder of SailPoint.

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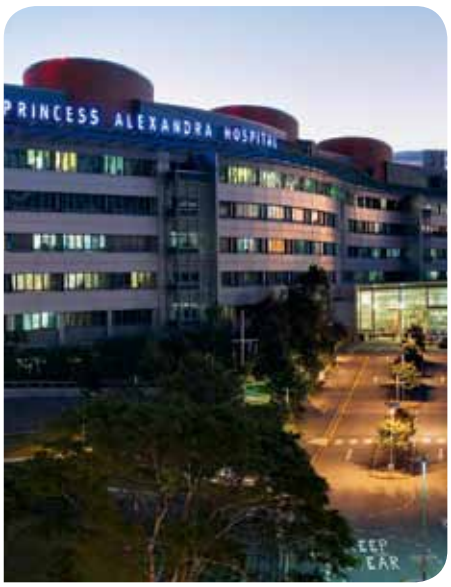
Australia's first digital public health service

Dr Stephen Ayre*

Queensland's Metro South Health recently completed an ambitious project to replace paper-based medical records with integrated electronic medical records across five facilities. Clinician input helped guarantee the project's success.



Images: ©Metro South Health

Health care is changing and so are our hospitals. Innovation and the introduction of digital platforms are shaping the way we build and plan our hospitals.

In 2015, Brisbane's Princess Alexandra Hospital (PAH) became the first large-scale public hospital in Australia to replace paper-based medical records with integrated electronic medical records (ieMR). An ieMR means a patient's medical information is documented and accessed via a secure electronic medical record, across all services including emergency, acute medical, surgical, mental health, cancer, rehabilitation and allied health services. The ieMR automatically uploads observations and vital signs from patient monitoring devices; allows efficient electronic ordering of radiology and pathology tests; and provides decision support for clinicians in prescribing, verifying and administering medicines to our patients.

Following the implementation at PAH, Metro South Health — Queensland's largest public health service by population — embarked on an ambitious project to roll out the ieMR across all other hospitals and facilities within 13 months. Since last year, Logan, Beaudesert and Redland hospitals, as well as the Wynnum-Manly Community Health Centre, have joined PAH in becoming digital facilities. At the time of writing this article, the organisation is preparing to complete the rollout with a final 'go live' at QEII Jubilee Hospital (4 June 2018).

The uplift to a digital platform has required an enormous effort, from redesigning brownfield sites to remapping and redesigning wards and medication rooms, all while keeping up with the regular demands of a health service.

A clinical change project

The success of this project has depended largely on it being treated as a clinical change project — not just an IT system implementation. To engage clinicians in the project, the complex and technical nature of the IT components had to be transformed into a language and context which resonated with clinicians and staff who were not IT specialists. In addition, when delivering such a large-scale change, the safety of patients needed to remain the highest priority. The implementation was achieved with zero patient harm, demonstrating the success of clinically driven processes for tailoring the rollout.

As with any large-scale change in a healthcare organisation, the digital implementation necessitated changes to models of care. For clinicians, it changed the way they thought about healthcare systems; it changed the way care was provided, in particular the engagement between patient and clinician; and it changed multidisciplinary team interactions. For these reasons, there was no single 'one size fits all' model that could be applied throughout the transformation — changes had to be designed and delivered in close consultation with each unique clinical area.

Metro South Health also needed to ensure that patients understood the benefits of the

digital platform, such as better monitoring to alert clinicians faster to deterioration, while being reassured that the security of their personal data was safe.

Infrastructure and workplace redesign

As health care continues to change, so do the requirements of the infrastructure in which it is delivered. To support the digital hospital implementation, since 2014 all Metro South Health facilities have participated in extensive consultation with key infrastructure experts, clinicians and relevant stakeholders to redesign work environments.

Infrastructure works at Princess Alexandra, Logan, Beaudesert, Redland, Wynnum-Manly and QEII facilities are now complete. All wards and departments now have access to various medical devices and IT equipment, all connected to the ieMR.

Metro South Health's key principle when planning and delivering these infrastructure upgrades was to ensure quality patient care with minimal impacts and costs to the organisation and its staff. A key focus was to ensure the infrastructure works implemented today would be sustainable for future workflows. Each department was individually assessed to meet safety standards, to ensure ease of movement for clinicians and to determine whether future digital workflows would work with their current configuration.

All facilities received extensive electrical system upgrades to meet the demand for connectivity with the digital hospital devices. The infrastructure works were completed with immense speed, while maintaining patient safety and comfort, infection control and the highest building standards. A team of device experts was deployed to integrate the new technology following the electrical works. This was not without some challenges in maintaining services while upgrades were undertaken.

Now leading to the final infrastructure uplift and digital implementation, QEII Hospital will benefit from lessons learnt from all other Metro South Health facility go live experiences.

Lessons learnt

The implementation has provided Metro South Health and its staff with opportunities for growth, innovation and continuous enhancements to the way the organisation provides patient care.

Crucial to the success of the project was the leadership role of clinicians. Having clinicians deeply embedded in the project ensured staff not only understood the role they played in the go live process, but also in realising the benefits to patient care through the ongoing use of the digital hospital system. While there was limited capability to change the functionality of the system, there was a significant opportunity to understand clinical workflows in each hospital and how they might be redesigned to be best supported by the ieMR.

This included a stringent, hospital-driven clinical governance framework that was essential to ensuring the safety of patients during the transition period and beyond. During each hospital's go live phase, daily clinician meetings were held to compile feedback from all levels of the hospital, to conduct a 'triage' on any issues which arose and to plan and deliver solutions to address those issues.

Critical also was the unswerving support of the board and senior executive in providing a successful outcome.

Metro South Health is looking forward to seeing the ongoing successes that the ieMR will bring to patients across the health service as we provide a connected information service between our facilities.

*Dr Stephen Ayre is the Chief Executive of Metro South Health in Brisbane. Dr Ayre has worked in senior management across health, including community health, medical services and executive leadership roles. Prior to his current appointment, Dr Ayre was the Executive Director of Princess Alexandra Hospital during its implementation of the Digital Hospital Program.

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Many people don't understand the importance of water filtration in their everyday environments. It is therefore up to professionals in the industry to educate others about the risks associated with prolonged consumption of these contaminants and the long-term effects they have on brain development and liver function.

'My results show that there is quite a significant concentration of lead and copper in the drinking water that is coming out of people's kitchen taps into their morning cup of tea,' says lead author of the study, PhD researcher Paul Harvey[1].

The team tested 212 'first drawn' samples from kitchen taps that were taken after the water had been sitting in a tap for a nine-hour stagnation period — similar to what happens when you run the tap in the morning to make your morning cuppa. All samples contained copper, while lead was present in 56 per cent of the dwellings tested.

Notably, 8 per cent of the lead samples contained higher than 10 micrograms of lead per litre, where Australian guidelines stipulate that drinking water should not contain any more than that.

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1. www.sbs.com.au/topics/science/humans/article/2016/08/11/widespread-lead-contamination-domestic-tap-water-found-nsw

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Images: ©John Gollings

Nurturing tomorrow's healthcare professionals

A luminous facade conceals state-of-the-art facilities where leading physicians and researchers share their expertise with Adelaide's aspiring healthcare professionals. For these future doctors, nurses and dentists — and their patients of tomorrow — the Adelaide Health and Medical Sciences building is a welcome addition to an expanding BioMed City.

The University of Adelaide's $246 million Adelaide Health and Medical Sciences (AHMS) building occupies prime real estate within the state's biomedical precinct, BioMed City. Notable neighbours include the new Royal Adelaide Hospital and the South Australian Health and Medical Research Institute (SAHMRI).

Home to more than 1600 students and 600 health researchers, the AHMS building integrates research and shared learning experiences spanning medicine, nursing and dentistry, along with health and medical sciences. Given its central location, students studying in the AHMS building are ideally located within easy access of industry experts and researchers from the nearby BioMed City.

State-of-the-art technology

Standout features of the AHMS building include the Adelaide Health Simulation centre, which includes 24 state-of-the-art simulation suites. Medical, nursing and health sciences students learn clinical skills in these learning spaces, which replicate the hospital environments they will likely encounter within a professional setting.

In addition to the advanced medical simulation suites, the AHMS building features:

- four floors of laboratories
- three lecture theatres
- study spaces
- staff and student hubs
- external balconies with Wi-Fi, heating and cooling
- a bicycle storeroom and end-of-trip facilities
- eateries and other amenities.

The top two floors of the facility house the Adelaide Dental Hospital, where the university's dentistry students undertake their clinical training.

Collaborating on campus

The AHMS building promotes collaboration between clinicians, staff and students, thanks to clever floor plans throughout the 13-storey building. Multimodal teaching areas provide flexibility for staff and students to vary how and where they interact. Meanwhile, a series of balcony terraces provide breakout spaces for informal gatherings.

A sense of community inside the building is palpable, but so too is the connection between the AHMS building and BioMed City. The design that helps facilitate this connection was the brainchild of architecture practice Lyons. Adrian Stanic, Lyons Director and project lead on the >

Adrian Stanic, Lyons Director and project lead on the AHMS building.

> **"We were determined to design a campus that responded to students' ambitions by empowering them to network easily — not only with their peers but also their mentors."**
> **Adrian Stanic**

AHMS building, was mindful of leveraging the site's location to help tighten the ties between today's medical professionals and tomorrow's healthcare providers.

"We were determined to design a campus that responded to students' ambitions by empowering them to network easily — not only with their peers but also their mentors," Stanic said. "Our objective for this building was for it to be a place of unique learning experiences and thus a place of inspiration."

Thoughtful design

The AHMS building is a warm and welcoming location for visiting clinicians and students alike. A network of indoor and outdoor breakout spaces are connected via a set of feature stairs that mark the ends of a three-storey colonnade facing the North Terrace pedestrian boulevard. It's a successful strategy that encourages interactions between people occupying or visiting the building.

Meanwhile, some of the outdoor vantage points boast spectacular city views spanning the River Torrens, St Peter's Cathedral and Adelaide Oval. Orientations that are predominantly outward-looking provide a sense of connection with Adelaide's CBD. Likewise, when viewed from outer-lying locations, the AHMS building serves as a beacon of both high-end design and higher learning.

"We now have the most high-tech healthcare teaching facility in Australasia with simulation suites that replicate the technology available in modern critical care hospitals, such as the new Royal Adelaide Hospital," said Alastair Burt, Executive Dean, Faculty of Health and Medical Sciences, University of Adelaide.

"By having access to the same technology, students are surrounded by the same visual cues and sounds, helping them to graduate work ready, reducing hospital costs and improving the delivery of quality and safe health care."

Location and logistics

Stanic describes the design as among the most challenging and rewarding of his career. "One of the early challenges actually provided us with a significant design opportunity in the form of a 20 m cantilever," Stanic said. "This was needed to negotiate the railway tunnel easement running through the east end of the site. Added to this was the fact that the site was hemmed in between the railway lines and a major road (North Terrace)."

Importantly, Lyons' solution also had to accommodate large flexible floor plates for teaching, learning and research uses. "We were challenged to figure out how to claw back significant portions of what was already limited ground area for dedicated campus open-space amenity," Stanic said.

"We recognised early on that the site shape alone would result in an asymmetrical building, so we developed the design as a series of elements. The corner balcony terraces created a unique emphasis at the ends of the building."

Meanwhile, a 90 m-wide frontage to North Terrace with an expansive cantilever, at its east end, presides effortlessly over an integrated Urban Park and campus ground plane below.

Lyons Architecture
www.lyonsarch.com.au

Prefabricated construction could provide healthcare facilities with many opportunities for efficiency, quality and cost savings compared to constructing on-site. So why is this technique not more widespread in hospital construction than it already is?

Prefab-ulous flexibility

Harm Hollander*

Currently in Australian hospitals, the factory technique of production is only striking acceptance in remote locations where minimising construction disruption is a major driver, or situations where there are significant repeated elements (such as dropping finished bathrooms into an otherwise traditional construction site). There are signs of the premanufacture industry breaking out of these limitations and being more widespread in acceptance.

Developing hospital flexibility

An often-cited constraint of a premanufactured module system is its tendency to be delivered with non-flexible, load-bearing walls, or at least with added bracing inside the partitions to face the harshness of transit. Any such hindrance for future change to walls is certainly not flexible and does not allow the hospital to keep up with the health service. A health service nowadays is fast-developing and the building which accommodates it needs to be responsive to the accelerating need for change. In some projects, this first barrier to flexibility has been overcome by providing an independent structural frame, rather than load-bearing walls. The need for the additional bracing has also been overcome by making these elements redundant (or at least relocatable), once the building modules are assembled on-site. Designers must, of course, remember to clearly identify the expendability of the bracing so that it is clear to ongoing trades who open up walls in the future.

However, hospital flexibility is more than the ability to move the internal walls. Once the changeability of partitions has been tackled, there are many further adaptability opportunities in modular construction. These include:

- **Uniform presentation:** It is an advantage for hospital users to utilise repeated building elements. An example may be a uniform consulting room. The uniform presentation ensures familiarity and a universal procedure[1], reducing a risk of errors (in health care, a small lapse of attention can be significant). Prefabricated building units have a greater chance of keeping their elements similar because of their regular set-out and the factory technique embedded into the nature of production.
- **Universal rooms:** These are generic rooms which suit multiple functions. For instance, a bedroom may be structured to suit a regular patient, mother, child or obese patient. Each function can swing with little alteration. With the room being suited for multiple purposes at the outset, it is likely to be rounded to a size which suits the multipurpose function and this again coincides with modular construction where the regular manufactured component is also expediently rounded. The result of the premanufactured module technique is a planning layout which is more likely to serve multi-use universality.
- **Modular planning:** This technique allows zones to capture a number of varying suites or rooms. Examples may include a series of operating suites or imaging modalities. Unlike universal rooms, this technique is more an allocated floor allowance, requiring a level of construction to move from one state to another. The technique is significant because it allows evolving change to clinical needs. Again, premanufactured construction is more modulated by its nature and has a greater predisposition towards modulated planning allowances.

Conclusion

The flexibility offered by prefabricated modular building systems represents an opportunity.

Naturally, these advantages do not just fall into place automatically. Designers will need to develop planning priorities and awareness in order to gain these advantages. Each new design should strive to improve the last. This process will incrementally increase value, quality, clinical effectiveness and satisfaction, as well as the ability for hospitals to better face the future.

*Harm Hollander is a Principal Architect with Conrad Gargett architecture firm.

Images: Conrad Gargett.

Broken Hill Hospital Community Health Centre (architect Conrad Gargett). This premanufactured module technique was made viable by the remoteness of the site and utilised uniform presentation, modulation and reverse engineering.

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Specifications

Product code	202178 Gas Medical oxygen
Gas content	0.639 m^3 (-639 litres) at 15°C and 101kPa
Cylinder fill pressure	20 000 kPa at 15°C
Diameter	115 mm
Height	524 mm
Weight (empty)	3.5 kg
Weight (full)	4.4 kg
Outlets – Firtree	Tubing diameter: 6-8 mm
(Therapy tubing connection)	Flow rates: 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 15 lpm
– Diameter index outlet (D.I.O.)	Maximum outlet pressure (g): 400 kPa
Also referred to as sleeve index system (S.I.S)	Flow rates: up to 300 lpm as per AS 2902-2005

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Images: Central Queensland Hospital & Health Service

Above: Mayor of Livingstone Council Bill Ludwig blows green = non-smoker.

Left: CQHHS Chief Executive Steve Williamson with Caron Williams launching 10,000Lives.

Central Queensland's ambitious plan to save 10,000 lives

Central Queensland Hospital and Health Service has launched an ambitious plan as part of the Destination 2030: Great Care for Central Queenslanders strategy to save 10,000 lives from smoking-related deaths by the year 2030.

The population of CQ in 2016 was 235,471 with approximately 16.7% or 39,323 individuals reporting to be daily smokers, compared to the Qld average of 12%. The 10,000Lives movement was born from the desire to reduce the rate of smoking to 9.5% by 2030 — in effect, saving 10,000 lives from smoking-related death, with additional health and wellbeing benefits to the CQ community being immeasurably higher.

Director and Public Health Physician Doctor Gulam Khandaker is leading the project and explained: "The 10,000Lives movement has been initiated to increase social awareness of the dangers of smoking, the funded pathways and benefits of quitting, and to support local community preventative action."

A key selling point for 10,000lives is Quitline's ability to offer a free, personalised quit smoking program for those aged 12 and over, which includes three months of free nicotine replacement therapy posted to the home. A Facebook support group for CQ smokers is up and running and high-profile representative sports clubs are on board to promote smoke-free living via social media platforms.

With community tobacco summits being conducted in the five Central Queensland Hospital and Health locations, the 10,000Lives movement is gaining momentum. Senior Project Officer Caron Williams has been recruited to build community capacity both within the hospital and health service system and externally through partnerships with GPs, sports and community organisations: influencers, who understand the importance of their contribution.

"We are excited by the recent data provided by Quitline indicating that since the announcement of the 10,000Lives movement in September 2017, calls and referrals to Quitline for Central Queensland have increased from an average of 140 per month to 278 per month," said Williams.

Aboriginal and Torres Strait Islander people living in Central Queensland and pregnant women who smoke are a key priority and the newly released Quitline data indicates 11% of calls to Quitline were from this cohort since September 2017.

GPs and clinicians are very influential in motivating their patients to taking action. Williams explained: "We encourage all health professionals to take every opportunity to start the conversation about smoking with their clients. People expect it to be discussed and they listen to what the expert says."

To ensure health professionals are up to date on the latest in smoking cessation, telehealth masterclasses conducted by experts in Brisbane are regularly streamed to CQ, as well as brief intervention training sessions. "We are implementing the 'smokerlyzer' (a breath testing device that measures carbon monoxide levels in smokers) for hospitals as well as at community health events. The smokerlyzer is effective in evoking an emotional response in smokers when they see the indicator go from green to red indicating the amount of poisonous gas replacing oxygen in the body.

CQ Hospital and Health Chief Executive Steve Williamson said saving 10,000 lives from smoking deaths by the year 2030 is a very ambitious target. "We realise we can't achieve this on our own, that's why we're enlisting the support of our health partners, businesses and influential community groups," he said.

Top healthcare printing solutions and why you need them

Hospitals, retirement villages, medical practices, GP surgeries and aged-care facilities are busy, people-centric places. Many provide 24-hour care, meaning they never stop operating. Effective care depends on smooth and efficient processes, and robust, reliable and secure communication and information sharing is mission-critical.

This is especially important for healthcare workers who rely on ready access to important and potentially life-saving patient data. That's why healthcare facilities will always need high-quality printers and print services they can rely on day-to-day.

Leaving a paper trail

Healthcare establishments see patients enter and leave all the time, which makes information management important. Every new patient needs to have their information entered and stored securely, with medical and other data added to records as their treatment continues.

And even though we've come a long way with electronic health records, certain documents and information still need to be physically printed, especially if the patient in question is undergoing specialist treatment.

There are also more mundane printing requirements, such as labels, wrist tags and prescription forms. The keys here are speed and reliability: staff just want to press 'print' on their computer, tablet or phone, and then collect their documents from a local printer.

In addition to regular document printers, scanners and multi-function devices, healthcare practices can also benefit from special-function devices such as mobile printers, labellers, label printers and special media printers that can produce documents and tags tailored for specific purposes and physical formats (such as patient wrist tags).

These save already-busy teams the hassle and wastage involved in, for example, printing out documents on an A4 sheet and then cutting them down to the required size.

There are other, less tangible benefits to acquiring the right in-house print solutions, including improved legibility (jokes about doctors' handwriting aside, this can be a real concern), consistency of communications and the simple convenience of a printed-out document that's truly 'platform neutral', can be dropped, folded and notated without harm, and which doesn't require a power source or battery charge to read.

Convenience means consistent care

Like almost every other part of our 21st century life, healthcare is becoming more mobile, more personalised and more responsive. Cloud services are the key to keeping data consistent and available across devices and locations, and the good news is that cloud-based printing services are secure and affordable.

So whether you're a GP who makes house calls or a major healthcare provider with teams in multiple locations, all you need to access speedy, secure printing is an internet connection, a cloud printing service and the right mobile printer, whether that's a standard A4 unit, a label printer, thermal printer or other specialised devices.

No matter what the project, the right printer can make the job a breeze. If it involves a nursing unit managers' meeting, a heads of department gathering requiring an update on a major project, or printing wristband names or labels for new hospital patients, medical equipment or helping keep important patient records on file, there's a printer out there that can do the job — helping health professionals in all types of organisations provider better, faster and more efficient care.

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Oracle's Unified Cloud Platform Promises to Shorten Clinical Trials

Rob Preston, Oracle*

Oracle's Clinical One Platform will enable pharmaceutical companies to manage every trial function — from randomising patient participants and collecting and analysing data to tracking budgets and ensuring trial safety — from a single user interface.

The process of standing up clinical trials has come a long way in 20 years, moving from paper forms and faxes to a much more automated, data-intensive endeavour. Still complicating the process, however, is the collection of independent systems that support a clinical trial's many functions — systems that were developed by multiple vendors on different IT platforms and stitched together piecemeal over the years.

As such, the trial setup process remains a lengthy, expensive ordeal with lots of redundant steps, holding up potentially life-saving treatments.

To address that challenge, Oracle Health Sciences is developing the Clinical One Platform, a unified cloud environment that will enable pharmaceutical companies to manage every clinical trial function — from randomising patient participants and collecting and analysing data to tracking budgets and ensuring trial safety — from a single user interface. And because the platform is cloud-based, it will bring all the benefits associated with cloud computing: cost efficiency, high availability, configurability, robust security, and the ability to scale up and down as trial demands dictate.

The logistics of clinical trials, which are designed to evaluate the effectiveness and safety of new drugs in human test subjects, are more complex than ever. Trials can entail multiple phases; the selection of hundreds of trial sites in multiple countries; the enrolment of hundreds or thousands of patients; the training of specialists in those countries, each with its own acceptable-care and safety practices; coordination with various contract research organisations

"Underneath the covers, Oracle's Clinical One Platform will be a single cloud environment that is flexible and brings to bear the functions that are needed for a specific trial." — Steve Rosenberg, Senior Vice President and General Manager, Oracle Health Sciences.

(CROs) and other partners; and the analysis of reams of original and third-party data.

It now takes three to five months for a pharma company just to stand up a trial, with much of that time spent on setting up and connecting the underlying systems and coordinating vendors, notes Steve Rosenberg, senior vice president and general manager of Oracle Health Sciences. And considering that some drugs require 30, 40, or sometimes as many as 70 trials before they receive regulatory approval, those months can add up to years quickly, Rosenberg says.

Because Oracle Health Sciences is building the Clinical One Platform from the ground up as a single, integrated cloud environment, it intends to cut the study setup time by 50 to 80 percent, he says, ultimately helping pharma companies get their drugs to market faster.

"That's an enormous time savings," Rosenberg says. "We are reimagining, if you will, the way that the software is consumed by pharmaceutical companies and CROs."

Flexible Architecture

Oracle Health Sciences has identified common functions that clinical trial teams can use to manage different parts of the trial process. "There's a function, for example, for 'display a form,' and that function can be used in your [interactive response technology] process, in your electronic data capture process, in your local lab management process," he says. "These functions become the micro–building blocks of these bigger capabilities."

The first Clinical One Platform capability, for randomising the selection of trial patients and coordinating drug supplies, is due to be available as early as July. Other capabilities, such as electronic data capture, clinical trial management, and data management, will follow.

"We may very well license those different capabilities separately, in a vernacular that the market understands," Rosenberg says. "But underneath the covers, Oracle's Clinical One Platform will be a single cloud environment that is flexible and brings to bear the functions that are needed for a specific trial."

Oracle's Clinical One Platform should also make it easier for pharma companies to meet another one of their main challenges: enlisting the many sites needed to conduct these clinical trials worldwide. Some sites choose their pharma partners based on, at least in part, the sophistication of their underlying systems, Rosenberg says.

Oracle Health Sciences, which has been developing its Clinical One Platform for almost two years, is uniquely positioned against a range of smaller competitors — many of which added system capabilities through acquisitions — to deliver this kind of interoperable platform, he says.

"No $400 million, $500 million company can invest the kind of money we invest to redo its platform from the ground up," Rosenberg says. And the reason Oracle Health Sciences is so efficient at it, he says, "is because we're taking advantage of all the Oracle tools — Oracle Cloud, Oracle's development environment, Oracle's scalability, Oracle's 12c database, Oracle's identity management," he says. "All of that stuff we get for free. We're focused just on the application services."

As Oracle Health Sciences builds out its Clinical One Platform's electronic data capture, clinical trial management, and other capabilities, "we envision our current customer base using them as part of their upgrade," Rosenberg says. The two main, complementary clinical trial platforms customers now use are Oracle Health Sciences InForm Cloud Service and Siebel Clinical Trial Management System Cloud Service.

While clinical research technology has come a long way during the past two decades, the industry is in need of a fresh perspective on how to "make the whole better than the sum of its technology parts," Rosenberg says. Oracle Health Sciences is doing just that with the Clinical One Platform, he says, unifying data and processes and bringing the benefits of the cloud to the entire clinical development lifecycle.

*Rob Preston is Editorial Director in Oracle's content central organisation.

Service design for the patient of the future

Less than a decade ago patients would automatically consult a medical professional to address their health issues. Now with the proliferation of technology and availability of information, the patient approach to manage their health care has shifted. In Australia, 50% of patients use websites to manage their health, as well as mobile apps (29%), wearable technology (21%) and social media (17%) to name a few.[1]

Furthermore, the days of patients being passive recipients of a service are long gone and they are now an integral part and resource in the value creation process.

As a result, patient interactions with healthcare professionals have changed and innovation in the design of services is imperative to meet the needs of patients, today and in the future.

What is service design?

Simply put, service design is the activity of planning and implementing change to improve a service's quality to meet the needs of the users of that service.

It is a holistic, user-centric approach to create services that are useful, usable, desirable, efficient and effective. The approach can be used to improve service delivery across healthcare organisations, whether it be a community health centre, outpatient department, emergency services, inpatient services or even a local GP practice. Any interaction between a patient and a service provider can be improved by service design methodology.

For any service design initiative to be successful, there are five core principles that form the foundation of service design:

1. User-centric

By placing the patient in the centre of the service, service designers are able to discover how the patient experiences the service in its wider context. This requires a deeper understanding of patients than statistical descriptors. Thus, service design uses empathic approaches like interviews, observations and field research to gather insights to understand a patient's true motivations, social context and habits. It is important to map out and assess the patient's needs, experiences and behaviours before co-creating a solution to be tested iteratively.

2. Co-creation

This is the process of involving stakeholders, not only in the solution's design but also in its production and development. The development, creation and testing of these services is called co-creation, and is usually done by multidisciplinary teams. Multidisciplinary teams allow various expertise, knowledge and skills, without which the solution would be very shallow. It creates a partnership between the professional groups as well as patients. Everyone has an opportunity to input their perspectives and experiences.

3. Iterative process

One of the main features of services design is not avoiding making mistakes but simply learning from them. This is achieved by prototyping and testing on end users and stakeholders. As a designer, you can save organisations a large amount of time and money if you test the experience before resources spend lengthy periods of time developing it.

4. Visual communication

Service designers often use visual aids like sketches, pictures or prototypes to communicate. In a collaborative team environment, it can be more expressive to draw than use words. Visual tools can be less complicated and more tangible. Clear communication between stakeholders is essential for the implementation phase.

5. Holistic services

These are services that look at the whole patient journey and consider each touch point of that journey. Service blueprints and user journeys and scenarios all investigate holistic patient experiences and touch points. This involves not only designing the functionality, safety and reliability of the service, but the whole patient journey as it is experienced by the users including both tangible and intangible qualities.

Service design is not just about being more patient-centred or promoting greater patient participation. It concentrates on placing the experience goals of the patients and users at the centre of the design process, along with process and clinical goals.

Reference:

1. Accenture Consulting, 2016, 'Accenture 2016 Consumer Survey on Patient Engagement – Global Report', 29 June, 2016, https://www.accenture.com/t20160629T045304Z__w__/us-en/_acnmedia/PDF-15/Accenture-Patients-Want-A-Heavy-Dose-of-Digital-Research-Global-Report.pdf, p24.

*Katie Bowden is passionate about informatics and digital health care and for the past 11 years she has worked as a Health Information Manager across a number of Local Health Districts in NSW Health. She is currently the Service Design Manager for NEXA. For more information, visit http://www.nexa.com.au.

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Complicating the complicated

Ramon Z Shaban*, Philip L Russo, Brett G Mitchell, Julie E Potter

Hospital-acquired complications data on urinary tract infections is unreliable, and could result in hospitals being incorrectly financially penalised.

In the Autumn 2018 issue of *The Australian Hospital and Healthcare Bulletin*, Shaban[1] provided an overview of the recent rise of financial penalties for preventable hospital-acquired complications (HACS) within the Australian health system. The Australian Commission on Safety and Quality in Healthcare (ACSQHC) has established 16 hospital-associated complications — a "complication for which clinical risk mitigation strategies may reduce, but not necessarily eliminate, the risk of that complication occurring"[1,2] — for which price prevention will shortly apply. The underlying philosophy of this approach is that all hospital-acquired complications can be reduced, but not necessarily eliminated, by providing patient care that mitigates avoidable risks to patients.

Infections of the urinary tract are one of the most common healthcare-associated infections, with the main risk factor being the use of an indwelling urinary catheter.[3] In broad terms, a urinary tract infection (UTI) is a general term referring to infections in the lower urinary tract (urethra to the bladder) or the upper urinary tract (ureters to the kidneys). Catheter-associated UTI (CAUTI) refers to infections that are associated with indwelling urinary catheter use.[3] Patients with UTIs are at risk of progression to sepsis, a condition with increased mortality.[4] Patients with symptomatic UTIs will require treatment, such as removing a catheter and antimicrobials.[5] Asymptomatic bacteriuria can often occur without urinary tract symptoms and may not require treatment with antibiotics, even in the presence of a urinary catheter.[3]

The ACSQHC reports that CAUTIs are the most prevalent of all hospital-acquired UTIs in Australia, and make up at least 80% of all hospital-acquired UTIs.[6] In response to this, the ACSQHC has recently published >

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HAC Tool Kits to assist health services with the implementation of this new price-prevention framework. In this publication, the ACSQHC reports that:

In 2015–16, hospital-acquired UTIs accounted for 26.6% of all hospital-acquired infections.[2] On average, a patient with a hospital-acquired UTI will remain in hospital for 20.6 days longer than a patient without this complication[2] and a hospitalisation involving a hospital-acquired UTI may therefore be associated with $42,724 in extra costs, with the national average cost per admitted acute overnight stay being $2,074.[5,6]

"...HACs data needs be derived from valid and reliable systems, especially if they are associated with financial penalties."

The validity of certain elements of data used by the ACSQHC to underpin UTI prevention measures and costs is uncertain. The suggested incidence of UTIs would appear to be consistent with previous studies.[7,8] However, there are no reliable Australian data, particularly in the absence of national surveillance and national HAI point prevalence studies.[9] Numerous studies have shown that appropriate statistical methods are required to estimate the contribution of infection to length of stay. Failing to account for these will result in a large overestimation of length of stay. A recent Australian study has shown that healthcare-associated UTIs may be associated with approximately four additional days in hospital.[10] A further issue is that numerous studies have shown that coding data is a poor predictor of HAIs incidence,[11-13] providing further evidence for robust HAI surveillance systems. If coding data is used for financial gain or penalty, the process is vulnerable to gaming.[14]

There is no question that HACs are here to stay. What we argue is that the source of HACs data needs be derived from valid and reliable systems, especially if they are associated with financial penalties.

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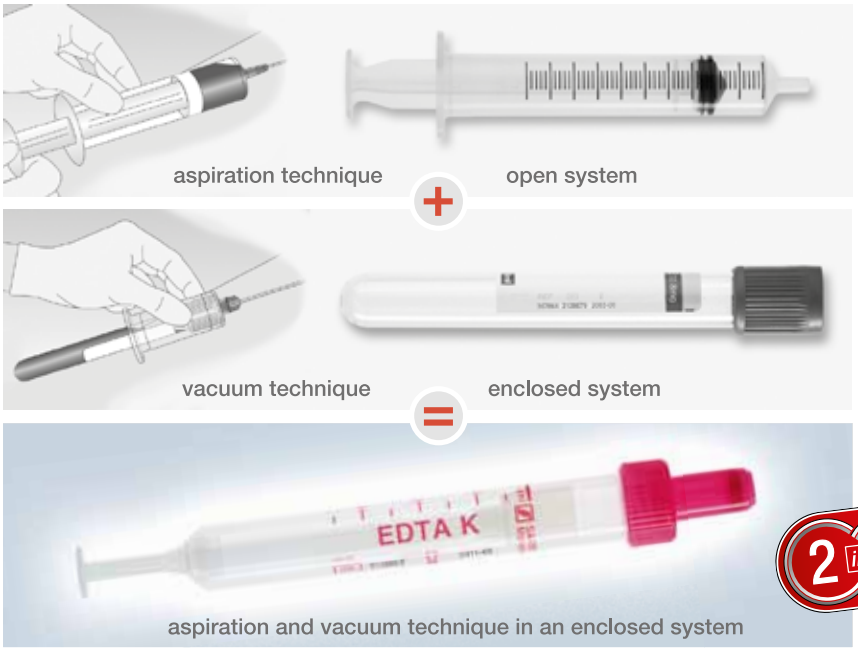

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Research has shown that in a healthcare environment, drying hands with paper towels may provide a superior infection control result than warm air- or jet air-dryers. Cathryn Murphy* examines the research and the extent to which the different methods contribute to air and surface contamination.

Should hand air-dryers be used in a healthcare setting?

Hand hygiene is well recognised as the most effective method of preventing cross-contamination and spread of infectious disease in healthcare environments. However, we are only now appreciating hand drying as a critical part of the hand hygiene process.

The World Health Organization (WHO) recommends hands washed with soap and water be dried so as to not recontaminate hands. WHO prefers a single-use towel for hand drying, arguing air-dryers may take too long to dry wet hands and more research is needed regarding aerosolisation of waterborne pathogens associated with their use.

Hand-drying techniques include spontaneous room air evaporation, cloth towels accessed by a rotary dispenser, stacked paper towels, warm forced air from a mechanical hand-activated dryer that causes evaporation and more recently, jet air-dryers which remove water by shearing forces and dispersal into the air.

Air-dryers in hospitals

Early researchers considered warm air-dryers (WADs) for use in hospitals although the short 30-second WAD drying time was inadequate and longer drying presumed to predispose hands to recontamination.

Subsequent research funded by WAD manufacturers compared paper towel and WAD use in experimental settings using volunteers. Unsurprisingly, the research concluded that certain WADs were hygienic and appropriate for use in health care and the food industry.

More contemporary perspectives compared paper towel use to using a WAD with and without ultraviolet light, while hands were rubbed and or held stationary. They concluded that WAD hand drying with or without ultraviolet light was more effective at removing bacteria than paper towel use, but only if hands were held stationary.

The emergence of JADs

To address concerns about increased bacteria associated with vigorous hand rubbing during WAD use and emerging criticism of WADs' increasing surface and airborne contamination, manufacturers then developed jet air-dryers (JADs).

Unlike WADs that warmed and vertically blew out unfiltered air, JADs were designed to expel high-efficiency particulate air in the form of two high-pressure knives of air at ambient temperature to strip water from hands held apart and drawn upwards through the air stream.

Paper towels prove superior

A 2012 systematic review found paper towels to be superior and more hygienic than air-dryers. It cited noise, surface and airborne contamination as well as associated hand dryness among users as reasons for classifying air-dryers as unsuitable for use in healthcare settings.[11] It also concluded three important points about paper towels. That they:

- cause less contamination of the washroom environment,
- are superior to electric dryers, and
- should be recommended in settings such as hospitals and clinics where hygiene is critical.

The review authors also recommended cost-benefit analysis prior to purchasing air-dryers given their high initial cost and labour intensity of installation. More recent studies have supported the review's conclusions and reaffirmed the unsuitability of air-dryers in healthcare.

Contaminating surrounding areas

Clothing contamination and dispersal of organisms up to a metre into surrounding areas through paper towel or WAD use has also been well studied.This, coupled with WAD-associated noise, resulted in researchers again concluding that WADs pose an environmental and occupational hazard and are unsuitable for patient care areas.

Other researchers stated that paper towels are preferable to WADs; however, noted that dispensers with buttons, cranks or levers increased the opportunity for contamination of washed hands.

As a result, educating users about avoiding accidental dispenser contamination is also important.In healthcare organisations, infection control and housekeeping need to work collaboratively to carefully assess design and siting of all paper-towel dispensers and to include routine cleaning of them as part of the daily schedule.

Airborne dissemination

Later research showed that both JAD and paper-towel hand drying produced ballistic droplets close to the event, although JADs produced more droplets that were also detectable further from their source,and greater contamination of adjacent walls. The investigators recommended that potential for environmental and personal contamination should also be included in selection of a hand-drying method.

Additional research confirmed that WADs and JADs produced greater airborne dissemination and increased the risk of cross-contamination compared to paper towels. Air-dryers were again deemed unsuitable for healthcare settings.

The debate continues

The debate is ongoing, with reports of JAD-related air bacterial counts 27-fold greater than paper towels. This is particularly concerning given the higher microbial load that can be dispersed when hands are wet or incompletely dry.

Healthcare settings would be wise to mitigate these risks and variability in hand hygiene compliance by only making paper towels available throughout their entire organisation until such time as well-designed, independent, research is undertaken in real rather than experimental settings using healthcare participants rather than volunteers.

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My Health Record — improving health outcomes for all Australians

Image credit: ©stock.adobe.com/au/MonkeyBusiness

Harnessing the power of the information revolution is one of the first priorities for governments seeking to improve the safety and efficiency of healthcare.

This includes using the potential of digital health to improve health outcomes for Australians.

This year, Australia has the opportunity, with the expansion of the My Health Record system, to create the digital health infrastructure that will produce benefits long into the future.

My Health Record is an online summary of an individual's key health information. Currently, more than 1 in 5 Australians already have a My Health Record.

In July, the program will be expanded to an 'opt-out' participation model and every individual with a Medicare or Department of Veterans' Affairs card will get a My Health Record unless they tell us they don't want one.

Through independent research, people have told the Australian Digital Health Agency that their preferred way to receive information about My Health Record is from their trusted healthcare providers, including hospital staff, GPs and pharmacists.

The benefits

My Health Record allows people to take control of their own health and wellbeing, manage their children's health, and upload key documents such as advance care directives.

They can choose who sees their My Health Record and what's in it. They can choose to share their information with the healthcare providers involved in their care.

However, in an emergency, for example, if a patient is unconscious, hospital staff may be granted access to their record if there is a serious threat to the patient's health and safety.

My Health Record has safeguards in place to protect an individual's health information including encryption, firewalls and secure login. My Health Record data is stored in Australia and is managed by the Australian Digital Health Agency in line with the Australian Government Protective Security Policy Framework. In addition to these measures, the My Health Record system is protected by legislation which governs the way the system is accessed, managed and used.

As more people use My Health Record and information in the system grows, it will help support clinical decision-making. All patients will benefit from having a digital record of their medical history that is accessible by their treating healthcare providers, particularly those who have complex health conditions or who see several healthcare providers.

For patients, My Health Record means their medical conditions, medicines, allergies and test results can be kept together in one place.

Many hospitals and healthcare services are already uploading information to and/or viewing information in My Health Record. As a healthcare provider, through My Health Record, you may see important health information that might not otherwise be accessible — such as hospital discharge, prescription and dispense information.

The opt-out period

The three month opt-out period will run from 16 July to 15 October.

During this period, anyone who does not want a record will be able to opt out by visiting the My Health Record website or calling 1800 723 471.

My Health Record

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For more information contact **www.digitalhealth.gov.au**

The power of one

Laini Bennett

As the leader of a $44 billion superannuation fund with 850,000 members — 80% of whom are women working in health and community services — HESTA CEO Debby Blakey lives the ethos that 'with great power, comes great responsibility'. We talked to Blakey about her experiences as a leader, and using her influence to improve women's rights and gender diversity.

Debby Blakey is modest. She plays down her achievements, deflecting praise back onto her employees, of whom she is clearly proud. She exudes warmth and an enthusiasm born from her passion for her role, and for her organisation. In fact, passion is a word she uses often, and believes it is a character trait required in leaders. "Every one of us at HESTA is very ambitious with what we want to achieve, and passion has to be what drives that," she explained.

But so is knowing your purpose, she added. "I love Simon Sinek's work on 'Finding your why'. Before I became CEO, I spent a time with a coach really understanding my 'why' and whether my purpose was aligned with the organisation. I don't think we talk about this enough."

Finding her path

Blakey's career started in the financial services industry in Durban, South Africa. After taking time off when her children were young and doing further study, she launched her own business, consulting on employee benefits to small and medium-sized organisations. In a country where compulsory superannuation still doesn't exist, Blakey was an advocate for change.

Twelve years on, Blakey moved with her family to Australia, where she re-did her certified financial planner qualifications, and began working with a small industry fund. In 2008, Blakey joined HESTA and found her 'why'. It was only on becoming Deputy CEO of HESTA that it occurred to her that she might one day become CEO. "I didn't wake up one day and think: 'I want to be CEO of HESTA'. I never had a five- or 10-year plan, but I have always had an eye on the future," she said.

Learning the ropes

One of Blakey's strengths as a leader is her ability to self-reflect and recognise areas where she has the opportunity to improve. She admits to moments of self-doubt, but says it's what we do with those moments that's important, asking herself: "What is the development need that I am potentially identifying in myself, and what do I do about it?" On becoming CEO for the first time, Blakey realised that there were skills that she wanted to build on — such as working effectively with a board.

"If there is ever a time when you need feedback, it's when you're CEO."

Blakey seeks feedback from the business about her performance. "When I became CEO at HESTA, I received good advice: that the more senior you become, the less feedback you receive. "And if there is ever a time when you need feedback, it's when you're CEO."

So she approached several people within the organisation whose opinions she trusted and asked them to be a conduit for feedback, letting her know what they thought of her decisions and how HESTA employees were responding. Blakey said it has been a powerful experience, and that she has made decisions based on the feedback received.

Leading by example

When it comes to gender diversity, Blakey believes HESTA leads by example. Its board is half male, half female, as is its senior executive. It's had female CEOs for nearly 20 years. "We believe that in the long term, organisations that have diversity at the board and senior management level will ultimately deliver better returns. Diversity is such a powerful enabler," she said.

Within HESTA, Blakey ensures that there is a strong focus on improving gender equality outcomes and a workplace culture based on inclusion and respect. She is delighted that HESTA has been recognised by the WorkPlace Gender Equality Agency (WGEA) as an Employer of Choice for Gender Equality for the last two years.

"We're committed to gender equality and that commitment goes much further than just talking about it. We want our actions and culture to reflect these values and to help drive long-term, meaningful outcomes," she said.

10 leadership attributes we can learn from Debby Blakey:

1. **Authenticity:** be genuine, be authentic.
2. **Purpose:** know your 'why' and that of your organisation.
3. **Emotional connection:** people remember how you make them feel.
4. **Passion:** find something you like, love it and embrace it.
5. **Feedback:** proactively seek performance feedback.
6. **Good listening:** leaders should talk less, listen more.
7. **Ask for help:** if you're new to your role, seek guidance.
8. **Juggling priorities:** identify what is really important to you.
9. **Diversity:** different perspectives make for better decision-making and stronger teams.
10. **Stand up for what you believe in.**

Images: ©HESTA

Blakey wants all women to experience similar equality, and speaks passionately about the issues facing HESTA members. She worries about the significant gender gap at retirement; that men retire with almost double the amount of super than women (which is why HESTA pays employees super on both paid and unpaid parental leave). She is concerned that healthcare workers are not earning salaries that reflect the important contribution they make to society, and the need for tax concessions on super that favour those on lower incomes.

The power of influence

Blakey wants to see HESTA use its power as a $44 billion fund to influence the world for better. "We see our responsibility as an investor as a far higher bar than just seeking good investment returns," she said.

Last year Blakey made news when she wrote to 172 ASX-200 organisations with less than 30% women on their boards, asking them about their plans for diversity at board and senior management level. As a major shareholder in many of these companies, HESTA is in a position to elicit change.

"If boards continue to only appoint men, then we feel at some point that, as an investor, we need to take action," Blakey said. This may include voting against the appointment of directors for any organisation that has no women on its board.

Blakey is also advocating for victims of family violence to receive access to their own super. "We do know that financial control is very often part of family violence.

"The victims and survivors may be faced with situations that, due to lack of finances, means they stay in the relationship," she said. Giving them access to funds would help them to rebuild their future.

Women helping women

While influencing policy changes can take time, Blakey believes women have a tremendous opportunity to mentor and support other women, to help them progress in their careers and in life. "The previous CEO of HESTA, Anne-Marie Corboy, was an amazing leader. She was so passionate about developing other women as leaders, and I was certainly a beneficiary of that.

"Talking to her one day, she said it always disappointed her when women stepped into more senior roles, then didn't look behind them to make sure that the door was open for other women to follow. She really lived that, and I hope that I am living up to that legacy.

"When you're given the opportunity to step up," she said, "look over your shoulder; look for the women behind you."

Breathe easy

Preventing hospital-acquired respiratory complications

Dr Robert Herkes*

Despite the strength of the Australian health system, an unacceptable number of Australian hospital admissions are associated with one or more hospital-acquired complications (HACs). These complications can adversely impact a patient's recovery and overall outcome, as well as the length of their hospital admission.

Respiratory complications are one example of these HACs, affecting more than 10,600 patients in Australian hospitals each year. Patients with respiratory failure and acute respiratory distress syndrome experience profoundly distressing symptoms. These symptoms include shortness of breath to the point of air hunger and overwhelming anxiety, while patients with aspiration pneumonia may experience worsening shortness of breath, cough, purulent phlegm, fevers, sweats, fatigue and drowsiness.

Risk factors for respiratory failure include:

- chronic obstructive pulmonary disease
- impaired mobility and inability to elevate head
- recent surgery, abdominal and chest wounds
- obesity
- nutritional status and hydration
- impaired swallow and/or cough reflex
- recent chest infection with ongoing production of secretions
- respiratory centre depressants, such as opioids, benzodiazepines and post-anaesthetic drugs
- respiratory muscle weakness due to neuromuscular conditions
- respiratory muscle fatigue
- severely compromised states of health.

Increasing costs

In addition to causing the patient distress, respiratory complications are also costly. Patients with a hospital-acquired respiratory complication will, on average, remain in hospital for 17.9 days longer than patients without one. It is estimated that each episode of care with this HAC could cost the hospital an additional $37,125.

Fortunately, significant reductions in respiratory complication rates are being achieved in some hospitals through preventative initiatives that are focused on increasing the provision of patient care that mitigates avoidable risks.

In 2015–16, the rate of hospital-acquired respiratory complications across all Australians hospitals was 24 per 10,000 hospitalisations. However, if all principal referral hospitals reduced their rate to 30 per 10,000 hospitalisations, more than 1500 hospital-acquired respiratory complications would be prevented each year.

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The Australian Commission on Safety and Quality in Health Care fact sheet on reducing hospital-acquired respiratory complications recommends a number of actions aligned with the National Safety and Quality Health Service (NSQHS) Standards (second edition), in particular the Comprehensive Care Standard, to reduce the number of these complications.

Some methods for preventing respiratory failure include:

- repositioning and/or mobilising the patient routinely
- elevating the bed head to sitting position
- providing supplementary oxygen as per medical orders
- active humidification for medical gases and appropriate administration of fluids according to the patient's clinical history and situation
- active and passive chest physiotherapy
- managing pain effectively.

Putting systems in place

The recommendations contained in the Commission's fact sheet are aligned with criteria set out in the Comprehensive Care Standard. Comprehensive care is the coordinated delivery of the total health care required or requested by a patient. This standard aims to ensure that patients receive comprehensive health care that meets their individual needs, and considers the impact of their health issues on their life and wellbeing. It also aims to ensure that risks of harm for patients during health care are prevented and managed through targeted strategies. For health service organisations with patients at risk of respiratory complications, these actions also include putting systems in place that are consistent with best-practice guidelines for the prevention of respiratory complications and ventilatory failure management.

Additionally, clinicians caring for patients at risk of respiratory complications should conduct comprehensive assessments and provide aspiration prevention and care in accordance with best-practice guidelines.

Further advice

All hospitals should be working towards reducing their rates of HACs. The Commission has released an information kit including fact sheets for reducing the occurrence of 16 of the most problematic HACs.

The fact sheets provide vital information for frontline clinicians, safety and quality professionals, managers, executives and members of governing bodies to minimise the occurrence of these complications: www.safetyandquality.gov.au/our-work/indicators/hospital-acquired-complications/hacs-information-kit/.

*Dr Robert Herkes is the Chief Medical Officer at the Australian Commission on Safety and Quality in Health Care, providing expert clinical advice to the wide range of programs managed by the Commission.

Reducing infections from contaminated needleless connectors

Needleless connectors (NC). They're used a thousand times a day in healthcare facilities worldwide where these small devices can have a big impact.

NCs give access to the vascular system and were originally designed to cut down on the number of needlestick injuries. These days they're described as the microbial gatekeeper of the Vascular Access Device[1]. Since their introduction, they've been shown to be associated with increased Catheter related blood stream infections (CR-BSI). They act as a perfect portal for microbes to get into the bloodstream with potentially devastating effect[2].

Small devices with big consequences

CR-BSI infections impact heavily both on patients and economics. It can mean up to 20 days of hospital stays, costing up to US$56,000 per patient[3]. Australian data shows on average patients stay in hospital for 16.8 days longer than those who don't suffer this avoidable complication. In 2015–16, 4,416 cases of CR-BSI were reported in public hospitals[4], at an additional cost of AU$34,843 per episode[5].

What's the right disinfectant for NCs?

Healthcare professionals seem to be confused about which is the right disinfectant, as well as when and how to use it to decontaminate NCs and reduce the risk of CR-BSI. They are resorting to guesswork which doesn't help.

What do the guidelines say?

International guidelines exist[6] and these show via studies that using friction is effective, as well as allowing key parts to dry.

The Infusion Nurses Society recognises that NCs are "potential sites for intraluminal microbial contamination and require strict adherence to infection prevention practices"[7]. Their advice includes the following:

- "Perform vigorous mechanical scrub for manual disinfection of the needleless connector prior to each VAD access and allow to dry"
- "Length of contact time for scrubbing and drying depends on design of needleless connectors and the properties of disinfecting agent"

In the UK, the Royal College of Nursing guidance states: "injection and access devices must be decontaminated using aseptic technique prior to accessing the device"[8].

Other National guidance states that "all injection and access sites should be decontaminated with 2% chlorhexidine gluconate in 70% alcohol. The solution should be applied with friction and allowed to dry, immediately before and after use"[9].

Australian guidelines also state: "**Clean key parts** 2% chlorhexidine/70% alcohol wipes is the application of choice"[10].

Methods of decontamination have also been studied and a new paper from a Brisbane-based research team has evaluated alcohol caps and alcohol swabs with and without Chlorhexidine, concluding that the optimal method of NC decontamination is 30 seconds with CHG swabs[11].

Clinell 2% Chlorhexidine in 70% Alcohol Wipes offer a successful solution

Clinell 2% Chlorhexidine in 70% Alcohol Wipes are the largest available measuring 190x105mm. The larger size, made from non-woven material, makes it easier to manipulate where it's being used. This cuts down on the risk of contamination from the clinician's hands or fingers and supports Aseptic Non-Touch Technique (ANTT) practices.

The wipes are TGA registered for surface disinfection of non-invasive medical devices, as well as IV Access ports (hubs & connectors) amongst other things.

The wipes come with the combined support of Clinell's Clinical Specialist nurses for training, which helps them to be implemented successfully. As with all new practices.

Clinell 2% Chlorhexidine in 70% Alcohol Wipes offer an excellent solution for those looking to adopt evidence-based practice in needleless connector decontamination.

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NEXT GENeration of aged-care professionals

THE FUTURE OF HEALTH

Sean Rooney*

The aged-care industry needs the best and brightest minds to ensure our growing numbers of older Australians receive the best care, support and service as possible.

Leading Age Service Australia (LASA) is launching the NEXT GEN initiative to attract more young leaders and professionals to steer the age services industry through a period of unprecedented growth and change and into the future.

The combination of increasing demand for age services, the emerging need for renewal and growth of the current workforce and the desire for new ideas, technologies and models of care to meet the changing needs of the growing numbers of older Australians make the NEXT GEN initiative a program of national importance for the age services industry.

The ageing demographics of Australia mean that any young career-minded individual who wants to make a positive difference in the lives of others has strong opportunities to progress their careers in the age services industry. There are many genuine career opportunities, working in either age services directly or in professions and trades that service our industry, where people can be challenged and rewarded, all while making a meaningful difference in people's lives.

The feedback we are hearing from young people is that they want to have a voice and they want to play a key role in shaping and driving the aged-care industry of the future.

The NEXT GEN Young Leaders Forum was the first event under LASA's NEXT GEN initiative and was launched by the Federal Minister for Aged Care Hon Ken Wyatt MP on Tuesday, 15 May in Perth.

The forum involved young professionals, current leaders, emerging leaders and board directors with a shared desire to make a positive difference in the lives of older Australians. Participants may have already been working in the aged-care industry or are ambitious young professionals seeking a dynamic new career path.

These young professionals are passionate and creative, with a vision that challenges many of the mindsets and models associated with the way we currently care for our older Australians.

Launching Australia's first aged-care Next Gen Young Leaders Forum in Perth, Minister Wyatt said strong, long-term demand and the promise of new professional pathways made the sector an ideal employment choice.

Laura Sutherland initially started her career in psychology and worked in Mental Health and Aged Care services in the UK. She took the leap into recruitment 13 years ago and continued to recruit to these sectors, which she has first-hand experience in and was passionate about. Having worked for some of the largest corporate recruiters globally, Laura identified the need for a more bespoke service to meet the unique demands of the aged-care industry. In 2012 Laura started her own business, 3D Recruit, offering specialist recruitment and workforce consultancy, with a pure focus on aged care and community services.

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Samantha Bowen is the Founding Director of Acorn Network Pty Ltd. Over the past 4 years, Samantha has worked with organisations and individuals from across Australia through hosting national events, presenting internationally on millennial engagement and even creating an innovative e-Mentoring Program for Australia's aged-care industry. As an emerging leader in Australia's healthcare scene, she has a strong list of accomplishments for someone in their early 30s, including Federal Board Member for the NHMRC'S National Institute for Dementia Research; a recipient of the Layne Beachley Aim For the Stars Scholarship.

"We are entering a golden age of ageing," said Minister Wyatt. "In WA alone, it's projected employment in health, aged care and social assistance will reach more than 180,000 by 2022, as our population ages and the sector becomes increasingly diverse.

"To put this in perspective, this is around 50% more workers than were in WA's mining industry at the peak of the resources boom in 2012.

"Forums like this are crucial, to highlight the aged-care sector's potential and to canvas ideas from young leaders about getting the message out."

*Sean Rooney is the national CEO of LASA. He has held several chief executive/senior roles in public, private and not-for-profit sector organisations including the CSIRO, Medicare Local Alliance and in the ACT Government.

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Older people in hospital are having their cake and eating it too!

Dr Adrienne Young*

A 10-year journey to improve nutrition at the Royal Brisbane and Women's Hospital

When thinking about hospital mealtimes, it is usual to think of poor quality food and impossible-to-open packaging. Or to think about eating while half-lying in bed, where the ability to feed yourself is restricted by drips, bandages and other medical paraphernalia. This scenario is far too common. Add in common problems of ageing such as poor appetite and difficulty swallowing, and it is not surprising that most older people eat poorly in hospital, delaying their recovery and return home.

But there is another way. The team at the Royal Brisbane and Women's Hospital have shown that it is possible to increase the nutritional intake of older people by 20% by doing things a little differently at mealtimes.

Long-term program

Over the past 10 years, a series of foodservice and mealtime improvements have been progressively introduced on the acute medical wards. High-calorie and high-protein foods are now standard offerings on the menu for all older inpatients. This means that a hot breakfast, extra desserts, creamy sauces and high-protein nourishing soups are offered daily to help with recovery. Small frequent meals are also on the menu, because patient feedback indicated that three big meals a day was too hard to stomach. Nourishing snacks like cheese and biscuits, yoghurts, milk drinks and even cake are now offered twice daily for all patients. Other changes to the foodservice system have also been met with high patient satisfaction, such as 'same day menus', increased variety in the menu and a spoken menu system.

At the same time as improving the hospital food, a program was underway to provide better care for older patients. It is well known that "the older you are, the worse the hospital is for you". To make sure that this wasn't the case at the Royal Brisbane and Women's Hospital, a doctor, physiotherapist and dietitian began working together to develop the Eat Walk Engage program.

Eat Walk Engage is based on the knowledge that good hospital care for older people starts with good nutrition, early and regular mobilisation, and meaningful activities to keep the mind active. This program has been shown to decrease the amount of time older people spend in hospital and the likelihood of developing a new health problem as a result of being in hospital (eg, pressure injury, delirium or decline in function).

A new approach to mealtimes

So, what does Eat Walk Engage look like for older patients and their families at mealtimes? Ward staff now highly value the mealtimes and have worked to rearrange their routines to maximise the number of staff available to help patients to eat their meal. This often involves changing staff meal breaks and shuffling around other tasks in their busy days to create extra

time to spend with patients during meals. Sometimes patients are brought together to share their meal at a communal dining table that is set up with homely touches such as a tablecloth and small vase of flowers. Patients and their families come together a few times a week for a social morning tea or 'happy hour' in a patient lounge or garden outside of the ward environment.

When the team monitored the nutritional intake of older people in their hospital over the 10-year improvement period, they were delighted to see that patients were now eating an average of 20% more energy and protein each day (900 kJ (215 Cal), 9 g protein). The percentage of older people eating less than their minimum nutrition requirements has almost halved (60% to 35%). Importantly, feedback from patients and their families has been overwhelmingly positive.

According to the team at Royal Brisbane and Women's Hospital, the patient was the most important part of this change. Keeping the patient and their story at the centre of every improvement helped to bring the team together and made sure that the work they did focused on something important to the patient. And finally, being patient is key. Change is not easy, nor does it happen quickly. Know that you are in this game for the long haul, and that your effort and perseverance will result in meaningful outcomes for your patients, even if it is 10 years later!

Factors for success

- Multidisciplinary implementation team: dietitians, nurses, doctors, occupational therapy, physiotherapy and foodservices bringing different perspectives to problems and solutions and allowed us to work together towards a common patient-centred goal.
- Making small, sequential changes: this allowed the team to build confidence and learn through the process, gain trust of ward staff and allowed time to embed processes and see the outcomes of the work.
- Using patient and carer stories to drive change: their stories allowed staff to see why improving nutrition was important and helped us to prioritise and focus on what patients told us was important to them.
- Measuring progress and sharing success: regularly auditing practice and outcomes allowed us to identify areas for improvement, measure success and generate evidence to convince organisational leaders to support and invest in the program.
- Using an implementation framework: provided us with a structure to guide our improvement program and helped us to avoid common mistakes in implementation (for example, using staff education as the implementation strategy, when change in systems and culture is what was needed).
- Be patient and persistent: it is not easy to make change, nor does it happen quickly. Know that you are in this for the long haul.

*Dr Adrienne Young is an Advanced Accredited Practicing Dietitian and is the Research Coordinator for Nutrition and Dietetics at the Royal Brisbane and Women's Hospital. Her research and improvement work focuses on providing the best care for older people in hospital through implementing supportive systems of care.

Invest in your people assets

John Boland*

Good staff are an asset to any organisation. Helping them update their knowledge and skills is a worthwhile business investment.

'Shaping Support Services — Strategies for Success' is the theme for this year's Institute of Hospitality in HealthCare's (IHHC) 37th National Conference and, after a long absence, the event will return to Sydney.

Sydney's changing landscape is the perfect backdrop for delegates to explore the ever-changing shape of support services in the health industry while enjoying all the attractions the wonderful Harbour City has to offer.

This is 5th IHHC conference I have been involved in and as I began to write this article, I had cause to reflect on what I have learnt over the years.

I was once told, "Conferences are what you make of them so make the most of them." These words gave me a different perspective on how to make all the events I attend or organise valuable and engaging experiences.

Following on from this mantra, I have learnt conversations are often more valuable than the sessions. Lectures and sessions might provide new ideas, but they can be one-directional while interaction with other delegates can result in unique, personal and insightful conversations, and these can only happen at the event.

This means that you need to prioritise spending time socialising with other people. IHHC conferences are designed to give our delegates and supporters numerous opportunities to meet people, through a variety of social activities.

Prior to attending the conference, it is always a good idea to develop a schedule of sessions and events you want to attend. Highlight those that offer the best fit for your role and organisation. If there is a session that does not interest you or not relevant to your role, take time to visit the trade exhibition. This is an easy way to meet people as the representatives manning the booths are very social and happy to have a chat. I have had some of my best conference experiences in conversations that started this way.

Conferences give you a chance to see a different part of the world so don't waste this opportunity. If your organisation paid for your travel, take advantage of their investment. Wise managers know the entire idea of sending you to a conference is to give you new perspectives and ideas, and some of that can best happen outside of the event itself.

One of the main lessons I have learnt over the years is good staff are an asset to any organisation and all assets require maintenance. If you were a piece of machinery, part of the corporate budget would go towards maintaining and upgrading you. Well, although you are not a piece of machinery, you are an asset to your organisation and they should be investing the same percentage of budget towards maintaining and upgrading your skills as they do for the rest of the corporate assets.

Hope to see you in there.

Institute of Hospitality in HealthCare Ltd (IHHC)
ihhc.org.au

*John Boland is IHHC National President and South Australia Branch Chairman.

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John Boland
Conference Chair

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Falling down

Daniela Feuerlicht, Suzanne Sheppard-Law, Reece Hinchcliff*

Too often, children are being injured by falls while in hospital, presenting a significant challenge to healthcare providers. Two organisations step up to change the status quo.

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Falls are a common cause of children being admitted to hospital and also being injured after admission to hospital. This presents a considerable moral and economic challenge to healthcare stakeholders in Australia and globally. Yet while hospital falls are already a national patient safety priority, there have been few investigations of the specific causes of hospital falls among children. Fortunately, the Sydney Children's Hospital Network (SCHN) and the University of Technology Sydney (UTS) are stepping up to the national challenge of reducing falls in children's hospitals.

The SCHN includes two major hospitals, the Children's Hospital at Westmead and the Sydney Children's Hospital at Randwick. Each year the SCHN has over 51,000 in-patient admissions, 92,000 emergency department presentations and over one million outpatient services. The large patient volume, clear emphasis on employing evidence-based practices and strong leadership of the SCHN make it an ideal organisation in which to examine the aetiology of paediatric falls. Working collaboratively with the Centre for Health Services Management and other UTS Faculty of Health academics, the SCHN is conducting a broad range >

of falls prevention research and intervention programs with national and international implications.

Interrogating the data

This body of work is exemplified by a recent innovative study that links falls data from organisational and state patient safety administrative reporting systems. Senior hospital management rely on the accuracy of these data to measure falls, monitor trends, report against falls-related national accreditation standards and inform patient safety strategies. However, all administrative datasets have inherent limitations due to selective definitions, coding challenges and other factors. This makes it necessary to critically interrogate and link the data from different systems to form a more complete picture of paediatric falls.

Over a one-year period at the SCHN, data linkage identified 146 paediatric falls reported in the state-wide incident reporting system and/or through routine data coding. This resulted in a falls rate of 0.88 per 1000 bed days for falls that were either physiological (ie, related to the child's medical condition) or accidental, typically due to the hospital environment. Falls due to the child's motor skill advancement were excluded, as they are not necessarily due to the hospital environment. These figures are similar to those reported internationally in paediatric facilities. However, there were considerable variations between the falls rates identified by the SCHN using different reporting systems. An important conclusion is that data linkage studies of this type should also be undertaken in other Australian paediatric hospitals to inform a more accurate understanding of national falls rates and trends.

Parental contribution

Additional research conducted by the SCHN has also illuminated several issues regarding the outcome of, main causes of and potential methods to reduce falls. For example, 43% of the patients who fell suffered some level of harm, including fractures. Almost half of the falls identified occurred at the patient's bedside. Parents or carers were present for around half the falls, while healthcare workers were present in 20% of cases. Furthermore, while parents experience a strong need, and indeed expect, to be involved in the care of their child, the physical and psychological demands of hospital-based care on their parental role may also contribute to inpatient falls. Parental fatigue and less vigilant behaviour on the removal of bed or cot sides to comfort their child are commonplace. Preliminary findings from a recent qualitative study suggest that parents of hospitalised children prioritise their child's general health and wellbeing, while giving little or no consideration to the specific risk of an inpatient fall, often increasing the chance of such incidents.

Emotional impact

While these figures are illuminating, it is equally important to retain appreciation for the emotional impacts of paediatric falls. As the following scenario indicates, these incidents

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affect not only the children involved, but also their families and the workers caring for them; it shows how simply, yet dramatically, falls can occur in paediatric hospitals:

James is a 3-year-old boy who has presented to the emergency department with abdominal pain. His mum and younger brother are with him. While waiting to be assessed by the doctor, James is sitting in a bed playing with toys. His mum has left the bed side down, to allow her to reach out and play with James. His mum is briefly distracted by James's younger brother, and the toy James is playing with moves out of his reach. In his attempt to reach the toy, he loses his balance and falls out of the bed, hitting his head on the floor. James is distressed, and his mum feels guilty for not watching him more closely. James needs to stay in ED for 6 more hours to be monitored after hitting his head.

Fall prevention strategies

By understanding which children are at most risk of falls, and deducing reliable falls data to measure trends, the SCHN has been able to develop more nuanced falls prevention strategies. One approach has been to use simulated scenarios to increase their workforce's knowledge of the primary causes of paediatric falls, and to improve the delivery of key falls prevention messages to consumers and their parents. These scenarios are modelled based on the qualitative and quantitative data collected regarding the main at-risk populations, parents' perception of falls risks and the locations and processes most commonly involved in falls incidents.

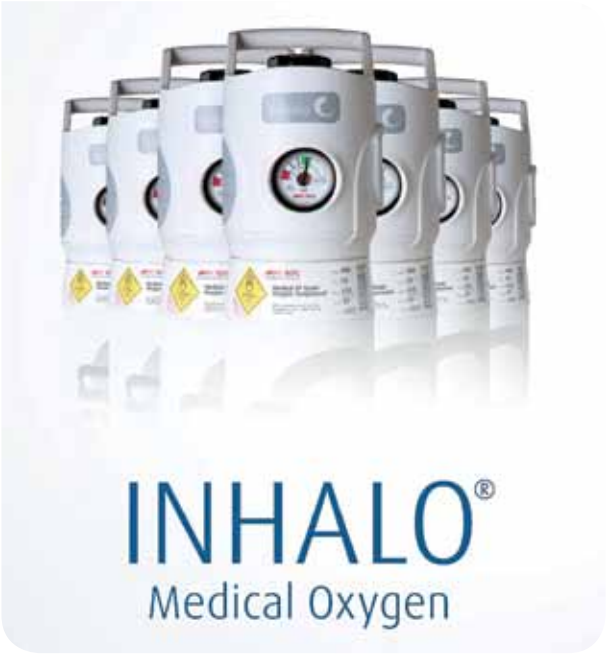
It is vital for Australian healthcare stakeholders to develop more detailed understanding of falls in children's hospitals and how to prevent them. The research and practical programs led by the SCHN in collaboration with UTS academics provide some early directions to inform the practices of other Australian paediatric hospitals. Key recommendations include the use of data linkage approaches to develop more accurate falls rates, and the use of simulation activities based on evidence-informed, realistic scenarios to foster workforce training in falls prevention and the development of family-centred education that reflects the needs of SCHN populations. Most importantly, we require greater national leadership and knowledge-sharing forums to ensure that Australian healthcare stakeholders continue to step up to the challenge of hospital falls among children.

For more information, visit the Centre for Health Services Management.

*Daniela Feuerlicht is the Acting Network Manager of Patient Safety in the Clinical Governance Unit of the Sydney Children's Hospital Network.

Suzanne Sheppard-Law is a Senior Nursing Research Fellow at the University of Technology Sydney, Faculty of Health and the Sydney Children's Hospital Network, Nursing Research Unit.

Reece Hinchcliff is a Senior Lecturer in the Centre for Health Services Management at the University of Technology Sydney and an Honorary Senior Research Fellow at the Australian Institute of Health Innovation, Macquarie University.



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Conference MC's

Are you at risk of criminal prosecution?

The successful criminal prosecution of a UK doctor shocked the Australian medical fraternity. Dr David Carter* examines the implications for Australia.

The recent criminal conviction of Dr Hadiza Bawa-Garba for gross negligence manslaughter in the United Kingdom has been making headlines in Australia. Australian doctors were reported to be "disturbed" and "dumbfounded" by the conviction.

Many expressed concern that it 'could be them' next, because the death in question occurred after what has been described as "a typical day" working in a hospital system under strain: Bawa-Garba had just worked a 13-hour shift, she was covering staff shortages, her usual consultant was away, the 'covering' consultant was more than 30 minutes away while the IT system was down.

Whether this is a 'typical' day in the Australian healthcare system is up for debate. However, what isn't up for debate is the serious conflict that arises between a health practitioner's duty to their patient and an environment where hospital and health services fail to provide sufficient resources and systems to support the exercise of that duty.

The case presents an opportunity to clarify the criminal aspects of the case, and especially to understand the Australian history of prosecuting the same offence in the hospital and healthcare setting.

The history

No health practitioner should be blamed for being anxious about the potential for a manslaughter prosecution — after all, in Australia, we lack even the most fundamental information about criminal law's actual use in the healthcare setting. It's not widely known how many criminal prosecutions have taken place in Australian jurisdictions for medical manslaughter. Nor do we understand their facts, contexts or findings, so in the absence of good information about the frequency >

of prosecution, we naturally import anxiety about events overseas.

But with the help of some recent research, we can start to fill out the picture a little better. For one, if history is any guide, Australian doctors are simply not at risk of undue manslaughter prosecutions being launched against them. The number of medical manslaughter prosecutions in Australia is tiny. Moreover, they are almost always unsuccessful. Until recently, only five prosecutions have been known to have been launched over the past two centuries in Australia: Dr Valentine (1842), Dr Reimers (2001), Dr Pegios (a dentist) (2008), Dr Ward (2009) and Dr Patel (2010). My recent archival work reconstructing the history of medical manslaughter in Australia turned up another 33 attempted prosecutions, and even then, not all even made it to trial. In total, this still leaves us with fewer than 40 attempted prosecutions that we know about, stretching all the way back to 1839.

Not only are there very few cases, so often they also fail to result in conviction. In total there seem to have only ever been five successful prosecutions: Dr Valentine (1842), Dr Hornbook (1864), Zimmler (a pharmacist) (1871), Dr Pearce (a GP) (2000) and Dr Gow (a GP) (2006), who pleaded guilty.

Understanding a little of the detail of these successfully prosecuted cases is important. Seeing the kind of serious failure required to be successfully prosecuted should allay some of the fear that any health practitioner 'might be next'. First, it is important to note that, so far at least, none of the successfully prosecuted cases relate to hospital-based incidents. In recent years, they have instead been directed at incidents that occurred in general practice settings. The headline-grabbing cases related to Jayant Patel were based in a hospital setting; however, Patel was never successfully prosecuted for manslaughter.

Second, it is important to note the severity of the failures of care involved. In each successfully prosecuted case the failures were of a fundamental nature, not merely unfortunate. This is true of old cases and new. Perhaps most notable in this regard is the 1864 case of Dr Hornbrook. Hornbrook administered a medicine (sulfuric acid) at some 13 times the maximum dose. As described by witnesses, Hornbrook was so drunk "he could not walk straight" at the time. He was found guilty, and served approximately one month of his two-year sentence before he received a pardon from the Governor. Notably, the pardon followed post-sentence lobbying of the trial judge by the local private medical fraternity of Goulburn, where Hornbook had practised; a campaign to which a letter to the local newspaper by an anonymous 'lover of justice' attests. More contemporary cases follow the same pattern of failures in fundamental duties; Pearce, for instance, had administered 15 milligrams of morphine to a 15-month-old child — the correct dosage was 1.5 to 3 milligrams. It was reported that she had failed to take a medical history of the child, nor advise the child's parent of the type of drug being administered or any risks associated with it.

Contemporary cases

In more contemporary cases, the pressures of the professional context have been taken into consideration. In the case of Dr Gow (2006) for instance, Gow mistakenly prescribed five ampoules of morphine tartrate to his patient instead of the less potent morphine sulfate. The patient, who was to self-administer this substance as part of a pain management regime for chronic back pain, died after injecting 120 milligrams of the substance. Gow admitted he had failed to prescribe the correct substance and had not provided the patient with dosage instructions. He pleaded guilty to manslaughter. Gow was described by the trial judge as deeply remorseful, and in choosing to suspend his jail sentence, the trial judge noted the failure of systems designed to stop such a "catastrophic" medical error, including review by the dispensing pharmacist. This was, according to the trial judge, "not to excuse Dr Gow's errors ... but ... to recognise that people, even professional people make mistakes".

It has repeatedly proven difficult in Australian courts to convict a doctor of negligent manslaughter, and even where they have, the conviction is made while expressing a strong sense of mercy. Nevertheless, criminal law — and especially offences like manslaughter — has always served important purposes. For one, it has been expressive of something important; it expresses to society something about the acceptable standards of behaviour and reinforces the value of human life. So when, on Radio National, Dr Norman Swan recently asked Dr Andrew McDonald, a paediatrician at Sydney's Campbelltown Hospital, whether the Dr Bawa-Garba case would change his medical practice, Dr McDonald responded, "Absolutely ... [t]his [case] absolutely confirms that every child [in hospital] should be seen every day [by a doctor] at consultant [or 'specialist'] level as didn't happen in this case. And if you are in a hospital where your Consultant is more than 30 minutes away, you are not providing safe care."

It may be difficult and thankfully very rare for a conviction of manslaughter by criminal negligence to be successful in Australia, but Dr McDonald's sentiment seems to demonstrate one of the powerful effects of the criminal law: that it signals to society the acceptable standards of behaviour and reinforces the value of human life, even in the face of difficult, even very difficult, environments.

"It has repeatedly proven difficult in Australian courts to convict a doctor of negligent manslaughter"

Image: ©UTS.

*Dr David Carter is a lecturer in the Faculty of Law at UTS where he focuses on the legal, regulatory and governance challenges involved in the delivery of safe, effective and sustainable healthcare services. At present, he teaches and writes on the regulatory practice of health law, public health law and criminal law, applying theoretical and empirical methods in aid of advancing legal and regulatory strategies for reducing the burden of healthcare-related harm and death.

TAKEO_2™ The Innovative Solution for enhanced Patient Safety and Cost Savings in Healthcare Facilities

Air Liquide *Healthcare* is proud to introduce TAKEO_2™, one of the world's first digital integrated cylinders. Australia is one of the first countries outside of Europe to implement this new technology.

About Air Liquide *Healthcare*

Air Liquide *Healthcare* is a world leader in medical gases, home healthcare, hygiene products and healthcare specialty ingredients. Air Liquide *Healthcare* aims to provide customers in the continuum of care from hospital to home with medical products, specialty ingredients and services that contribute to protecting vulnerable lives.

TAKEO_2™ is a major innovation in the Medical Oxygen field. This new generation cylinder combines a built-in pressure regulator, an ergonomic cap and a patented digital gauge, to provide healthcare professionals with the industry's safest and most cost-effective medical oxygen delivery system.

This new technology allows caregivers to better manage the administration of medical oxygen, by viewing the remaining time and volume available at a glance.

What does TAKEO_2™ mean for me?

This solution provides major benefits to healthcare providers:

Greater patient safety by reducing the risk of oxygen supply interruption:

- Staff can safely plan oxygen dependent transfers having immediate and accurate cylinder duration time.
- The permanent display of the remaining time and available volume as well as the safety alerts indicate when the cylinder needs to be replaced.
- The integrated valve with built-in pressure regulator provides a higher level of safety as it reduces the possibility of adiabatic compression associated with detachable pressure regulators.

Improved ease of use and faster oxygen set ups:

- With an ergonomic cap, a comfortable handle and a straightforward flow selector, patient care is significantly facilitated.
- The time-related data provides an unprecedented comfort level to caregivers who can better focus on their primary responsibility, the patient.

Cost efficiency through an effective use of the cylinder content and reduced equipment cost:

- With direct and exact information on remaining time, staff members are more confident to use most of the cylinder contents as they have a better control of the autonomy of the cylinder.
- Featuring an integrated valve, **TAKEO_2™** does not require a separate regulator to be attached. This eliminates the need to purchase regulators for medical oxygen cylinders, or to manage their maintenance and repair.

The use of the integrated **TAKEO_2™** cylinders reduces redundant and inefficient activities, enables caregivers to reallocate their time on the patients and delivers significant cost savings for the healthcare facilities.

How does it work?

When the cylinder is in use, the patented digital pressure gauge calculates and displays the time remaining in hours and minutes. No more estimations or calculations of the remaining content are required as **TAKEO_2™** cylinder provides direct intelligible information to medical staff with the remaining treatment time at the selected flow.

When the cylinder is not in use, it displays the available volume in litres. The device also features visual and audible warning alerts which indicate when critical levels are reached.

Safety messages are triggered:
- **When oxygen pressure is under 50 bars (¼ content)**
- **When the remaining contents fall below 15 minutes**

Air Liquide HEALTHCARE

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For more information, please contact **1300 360 202** or visit **www.airliquidehealthcare.com.au**

UX: improving patient, clinician experiences

As a hospital or health organisation clinician, patient or carer, you may have heard about the importance of UX (user experience) and the impact on daily delivery of health care.

User experience (UX) design, service design, design thinking and co-design are all phrases that have entered the everyday vocabulary of clinicians and managers working on innovation in healthcare delivery.

It may be new terminology, but everyone agrees that 'design' has an important role to play in the delivery of innovative models of care.

So, how do you get started with design on your healthcare projects?

There are some practical steps involved in engaging stakeholders and consumers in the design of innovative healthcare services and products.

You also need to understand:

- What are UX and usability?
- What problems are disciplines like UX design and usability engineering trying to solve?
- What are the symptoms of these problems?
- What are some examples of prevention strategies around, and solutions to, these problems and what do those solutions look like?
- What are some useful skills in this space that participants can apply back in their workplaces?
- Where to from here in relation to usability and UX in health IT and digital health … what does the future look like?

Hospital and healthcare professionals are invited to learn about UX at a special one-day event at the upcoming Health Informatics Conference 2018 (HIC) in Sydney from 29 July–1 August.

A dedicated UX day on Sunday, 29 July features two special workshops:

Usability Workshop, led by Bennett Lauber, Chief Experience Officer, The Usability People.

In this workshop, participants will be taken through the detail of achieving good usability. It will cover issues such as usability specification and design, usability engineering, testing and certification.

Design Workshop, led by Chris Marmo, from Paper Giant, with Pamela Scicluna, from Kianza, a health technology company and UX expert Bernard Schokman.

This workshop will walk through two case studies in detail, explaining all the practical steps involved in engaging stakeholders and consumers in the design of innovative healthcare services and products.

The one-day event will also feature keynote speakers, special case studies and a panel discussion.

HISA has launched a community of practice for those interested in exploring and learning about health user experience (UX).

"All clinicians and healthcare professionals share something in common with their patients — navigating the health system can be a tough slog," said HISA CEO Dr Louise Schaper.

"High on the list for HISA's UX Community of Practice is raising awareness about this wicked problem — improving the clinician and patient user experience across healthcare settings with all the challenges that presents.

"When clinicians get involved in co-designing systems, we are on the right path for a great healthcare experience," Dr Schaper said.

Bennett Lauber

Bernard Schokman

The UX Network community of practice is led by UX expert Chris Bain, Professor of Practice, Digital Health Faculty of IT, Monash University. Prof. Bain said: "We'd all be in a much better place if systems were more usable and clinicians had a positive experience of health IT.

"While clinicians can sometimes be poor at communicating the exact problem to which IT is a possible solution, in no small part it is the role of informaticians and other relevant professionals to glean this information.

"Not providing specifics, however, can lead to ambiguity and frustration, and root problems can remain unsolved.

For more information on the HISA UX Network Community of Practice, call the HISA office on (03) 9326 3311.

Join Bennett Lauber and other UX leaders at the health UX workshop at HIC 2018, Australia's digital health conference, in Sydney on July 29, 2018.

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In Conversation
with Dr Rebecca Laborde

Laini Bennett

In Conversation provides a glimpse into the life of an 'outlier' — an exceptional person going above and beyond to improve outcomes in their field. In this issue, our guest is Dr Rebecca Laborde, Oracle Health Scientist and Strategist.

How did you come to be in your current role?

I have a scientific background in translational research and precision medicine and was a bench scientist for 20 years before coming into IT. My PhD was in genomics, and I did my advanced training at Mayo Clinic.

I became interested in the IT space and understanding how a smart application of technology can move outcomes and improve patient care faster. So I transitioned to a scientific-based role in an IT environment, to bridge the gap between the technology and the end users.

What exactly does a scientist and strategist do?

I function as a data scientist and spend all my time working with current and prospective customers — for instance, medical centres, hospitals and clinics — helping to identify solutions that will support their initiatives and result in improved patient outcomes, costs and efficiencies. I also work with biotech and pharmaceutical companies.

How is Oracle technology assisting with data use and management?

We're providing technology solutions that institutions can use to create environments for aggregating and managing their diverse data. Some of the data is highly structured, for example, medical records data. For this we have developed relational data models that can aggregate that data, bringing together clinical, laboratory, genomics and financial data.

Other data types that may benefit a particular patient in the future are less structured, such as clinical notes dictated by a clinician, written down or typed up. It's easy to miss important information when it's captured that way, and almost impossible to use across a population to learn anything about outcomes or trends. These unstructured text sources may be converted to useful data elements through the application of natural language processing (NLP). This work often occurs in a data lake environment, with valuable data insights then being aggregated with structured data. Oracle supports all of these approaches. Implementing this type of environment allows for enterprise-wide use of data from a trusted source to drive analytics in clinical care, cost efficiency and precision medicine.

What is Oracle doing to protect data privacy and its ethical use?

This is a very complicated area. Just look at the landscape: for example, let's say I have a patient who comes into the clinic and provides a sample under clinical care. This represents clinical data that can be used to treat that patient. Often times they will also agree to sign a research consent. So now that clinical data also becomes research data, but it can't be used for research without an approved project, which means that data can only be used downstream in a controlled setting.

Oracle's tools can pick up that information about data permissions and consent and only provide the data elements to the approved people who have the right to access it. And more importantly, in the correct form of identification. Having the tools to de-identify data is very important. Our tools remove the effort and uncertainty of having a person manually de-identifying data.

How are healthcare facilities using technology to reduce costs and improve outcomes?

An interesting example is The University of Texas MD Anderson (MDA) Cancer Center in the US, which runs their Cancer Moon Shots program based largely on the Oracle platform. This program aims >

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In Conversation

with Dr Rebecca Laborde

to reduce mortality and suffering from 13 cancer types, using a variety of tools including multiple Oracle-based research solutions.

When MDA implemented the program, we assumed they would use it primarily for translational research and genomics, but the first area they focused on was pharmacy analytics to answer the question "how do we improve patient outcomes and save money in pharmacy?"

They wanted to align their multiple compounding pharmacies, their clinicians and their large patient population — some of whom were travelling from as far as Europe for treatment — to ensure all were available at the same time. This challenge was impacting the cost of the product and staffing, the keeping of patients on protocol and patient satisfaction.

MDA pulled in all the data sources related to these different pieces and performed analytics to understand where the issues were in the pipelines. It then standardised processes and ensured all the critical pieces came together in the same location, at the same time. The result was not just improved efficiencies and cost savings, but an improved clinical outcome — those patients were receiving their treatment when they were meant to.

This project significantly improved efficiencies for MDA — and provided them a rapid return on their investment in Oracle platforms, which they reinvested into other projects such as precision medicine. So the cost savings derived from the technology are now driving patient outcome improvement, because if you're doing everything cost-effectively you can offer a greater level of service.

What's on the horizon in terms of technology?

Machine learning is a hot topic. Healthcare organisations are treading cautiously, as they should, and essentially moving it into the research space first, finding smart ways to integrate it.

Another big trend is natural language processing. This is already heavily in use in health care. Clinical notes and unstructured text hold a goldmine of data for institutions, both in terms of clinical value and cost value, and having the technology to access that in an automated way is really critical.

The third trend is genomics, seeing diversification of data for clinical use. We're starting to see full exome and genome sequencing, because it's cheaper to generate, store and manage, and we know more about it. But we're also starting to see other genomic types, like sequencing RNA. So clinically, we're seeing examples where we're generating more than one genomics type to diagnose a patient.

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Out & About

Winners announced for National MedicineWise Awards

Winners of the biennial National MedicineWise Awards were announced at the 10th National Medicines Symposium (NMS) in Canberra.

The awards recognise best-practice innovations in improving quality use of medicines across seven categories, including initiatives for consumers, Aboriginal and Torres Strait Islander people, health professionals and e-health.

NPS MedicineWise Executive Manager and Chair of the NMS 2018 Program Committee Kerren Hosking said, "These winning awards are excellent examples of innovative, relevant and useful initiatives showcasing the depth of work underway across the country to support safe and effective use of medicines."

In 2018, winning entries included new approaches to sustaining mental health, pharmacotherapeutics for remote area nurses, better medicines management in aged-care services, new healthcare apps and initiatives designed to support Aboriginal and Torres Strait Islander communities.

For more information on awards, visit www.nps.org.au/nms2018/awards.

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Images: ©NPS MedicineWise

1. Mark Naunton, Sam Kosari and Nicole McDerby. 2. Larissa Hallam 3. Grace Wong with Dr Lynn Weekes. 4. Steve Cohen.

HESTA Nursing & Midwifery Awards

Australia's best nurses and midwives have been nationally recognised, with the winners announced at the 2018 HESTA Australian Nursing & Midwifery Awards.

Held annually, the sector's most prestigious awards recognise graduates, individuals and teams for their professionalism, innovation and care across a range of health settings.

Each winner received $10,000 for further education or team development.


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1. Matthew Mackay (COO Royal Rehab), Cheryl Macnaught (HESTA) and Wayne Wright (CFO Royal Rehab). 2. Jasmine Yarran, Gail Yarran (HESTA 2018 Nurse of the Year) and Dallas Yarran. 3. Alia Khan (Australian Private Hospital Association), Neil Saxton (HESTA) and Frith Rayner (Australian Private Hospital Association). 4. Emma Fitzpatrick, Reenie Kuypers and Robyn Dempsey (Aall from Midwives @ Sydney and Beyond). 5. Deanna Ward (Cairns Private Hospital), Mim O'Flynn (The Kombi Clinic), Debby Blakey (CEO HESTA)


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Pseudomonas aeruginosa	60 seconds	EN 14561
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Enterococcus faecium (VRE)	60 seconds	EN 14561
Enterobacter cloacae (VRE)	60 seconds	EN 14561
Klebsiella pneumoniae (CRE)	60 seconds	EN 14561
Acinetobacter baumannii	60 seconds	EN 14561
Staphylococcus aureus (MRSA)	60 seconds	EN 14561
Staphylococcus aureus	60 seconds	EN 14561
VIRUSES		
Norovirus (MNV surrogate)	60 seconds	EN 14476
Influenza (H1N1)	60 seconds	EN 14476
Herpes Simplex	60 seconds	ASTM E 1053

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