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BULLETIN **WINTER 2015**

Healthcare's Information Age

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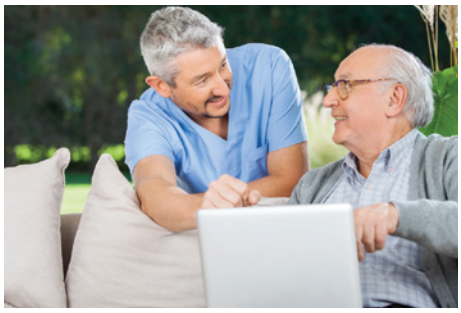

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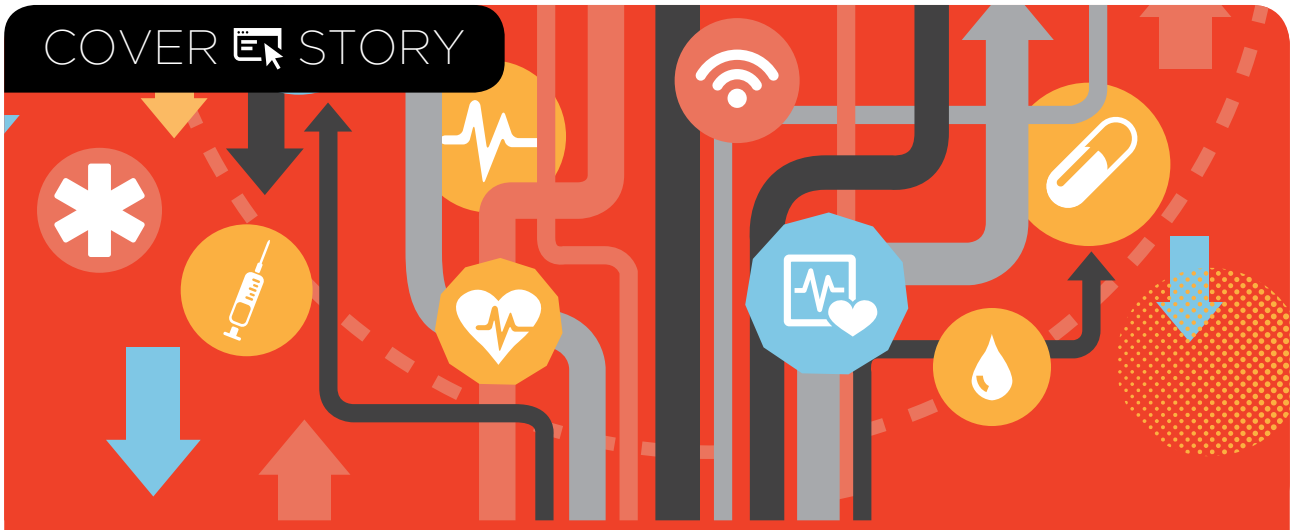

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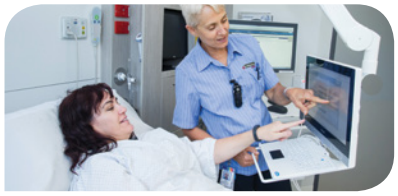

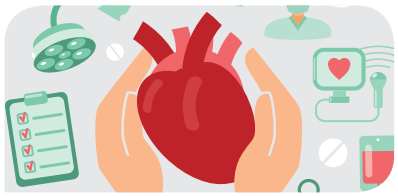

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FEATURES

Infection Control

Best-practice virology and microbiology research on Alcohol-Based Hand Rubs and how to apply hand hygiene in the clinical setting.

Wound Care

Shelley Morris from the Australian Wound Management Innovation Cooperative Research Centre presents findings on 20 years of research.

Notes on Design in Healthcare

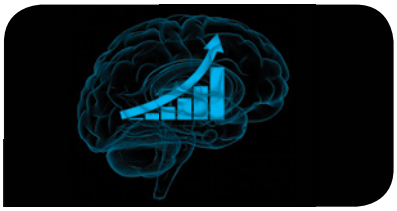
Andy Black presents findings on his work as a UK hospital design consultant on optimal hospital design.

Evaluation of the National Safety and Quality Health Service Standards

Have the NSQHS Standards made a difference to patient safety and the quality of care and what impact have they had?

Acute Coronary Care

The Australian Commission on Safety and Quality in Health Care (the Commission) has developed the Acute Coronary Syndromes (ACS) Clinical Care Standard.



Ultrasound

ASUM report on their certification program and recent training program for rural and remote nurses. *ADIA* explains the ins and outs of Medicare coverage on diagnostic imaging (**PAGE 98**).

Published quarterly, The Australian Hospital and Healthcare Bulletin is an independent voice for the hospital, health and aged care professional containing regular features on major projects, healthcare disciplines, e-health, Government updates, news, conferences and events.

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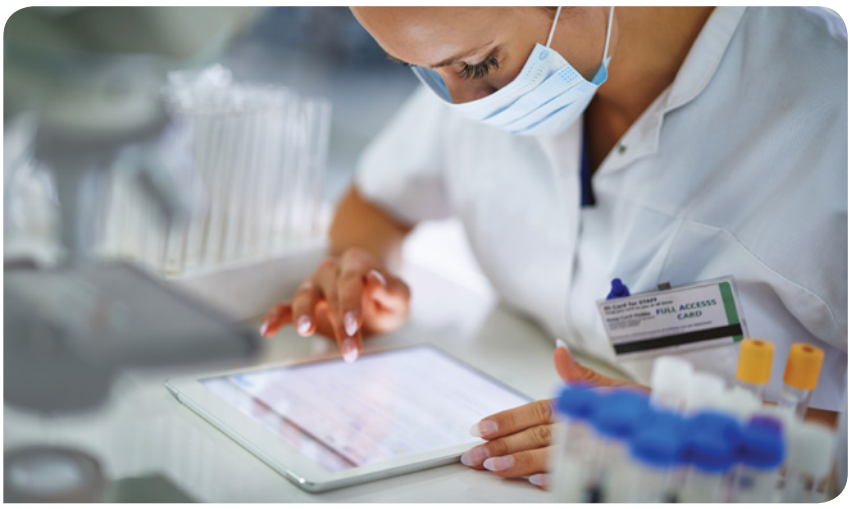

Healthcare's Information Age

Sharon Smith
Editor
ssmith@aprs.com.au

The Budget has been announced and the focus of the healthcare industry seems to be on bringing Australia's system into the information age with an overhaul of the online public health records first introduced by the Labor Government. We have rounded up industry experts including Dr Louise Schaper of the Health Informatics Society of Australia (ahead of their national conference in August); Dr Yvette Blaunt, a research coordinator focusing on telework and eHealth; regular columnist Dr David More who takes us through Telstra's plans for eHealth; and Dr Maia Sauren discusses the latest health-related software and applications emerging from the 'charitable' hacking scene.

Of course the NPS MedicineWise Choosing Wisely campaign has been announced, and Dr Matthew Anstey is here to take us through the initiative.

Research and education updates abound, thanks to an update on the Wound Management Innovation CRC from Shelley Morris, and Tanya Carleton and Eliza Welch report on Australasian Society for Ultrasound in Medicine Certification's new ultrasound training program for remote and regional midwives. The Australia Diagnostic and Imaging Association presents future advancements of DI and the patient perspective of DI under Medicare.

We take a look at infection control through hand hygiene; the Acute Coronary Syndromes clinical standards as well as the impact the National Safety and Quality Health Service Standards have had across the nation.

Aligning patient wishes with critical care and helping patients experience a dignified death are sensitive subjects, discussed in poignant pieces by A/Prof William Silvester from ANZICS and the team at Australian College of Nursing.

Our regular design in healthcare feature focuses on patient care and dignity with UK consultant Andy Black, and Medecins Sans Frontieres takes us through the process of building an emergency hospital facility in the aftermath of the Nepal earthquake.

And finally this issue we farewell our former editor Petrina Smith who has spent years building the publication to the quality magazine it is today. From all the team here at Australian Hospital and Healthcare Bulletin we would like to thank Petrina for her hard work. As a quick introduction, I have worked in communications at Brisbane's Mater Health Services and spent the last few years as a science and technology journalist. I am excited to take the reins as the new editor and hope I can serve our readers just as well as Petrina did.

Sharon

Until next time,
Sharon Smith, Editor
ssmith@aprs.com.au

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The Evolving Health Workplace

Imagine your healthcare workplace operating with the efficiency of today's banking, travel or e-commerce systems. Test results, event histories and complete medical information about your patient would be at your fingertips; letters and referrals would arrive efficiently to your desktop, tablet or phone; consultations and appointments would be made electronically; sharing important information would happen securely and in real time.

The winners are you and your patients, along with your colleagues and the healthcare professionals you work with every day across the system.

This is a picture of the digital health workplace of the future and the reason the Health Informatics Society Australia (HISA) is one of the most rapidly growing peak bodies for Australian healthcare professionals. As the peak organisation for digital health, HISA provides information, networking, education, certification and career development for everyone – whether they are just learning about eHealth, telehealth or digital health or already well into a health informatics career.

And as HISA prepares for its annual conference HIC 2015, in Brisbane 3-5 August, the theme *Driving reform: Digital Health is Everyone's Business* sets expectations for **every** attendee who can identify with the changing Australian healthcare industry and the evolution of the health workplace.

HISA CEO Dr Louise Schaper said the HIC theme reflected the sense of urgency around the arrival of digital health, eHealth and telehealth to Australian health workplaces.

"More and more nurses, doctors, health IT workers, policy makers and others are joining HISA because they can see the need to get across technological change. This digital disruption has already happened in so many industries and it is now coming to Health."

"Australia's first fully integrated digital hospital, St Stephen's at Hervey Bay - drew a great deal of interest when it opened recently."

"For HISA, a key focus is workforce development - working with organisations, public and private, to equip them and to fully prepare for this new era of digital healthcare."

"The health workforce requires the knowledge and skills to use eHealth systems as part of their daily work," Dr Schaper. "It has happened at Hervey Bay, it is happening elsewhere and it will ultimately be business as usual across the health system."

"If you want to increase the productivity of your health workforce, you need to give people well-designed and well-implemented eHealth tools and up-skill them in health informatics and make sure **they** are the ones leading the transition from paper to digital," she said.

"For HISA, a key focus is workforce development - working with organisations, public and private, to equip them and to fully prepare for this new era of digital healthcare."

She said HISA had launched a successful certification program. In the past year, more than 90 healthcare professionals had passed through the Certified Health Informatician Australasia program (CHIA) which demonstrated the growing demand for professional acknowledgement of skills and experience in health informatics. CHIA provides independent recognition of your eHealth knowledge. " CHIAs work at the intersection of healthcare and information technology and if that sounds like you, then I would encourage you to apply to take the CHIA exam."

Everyone is invited to learn more at HIC

Dr Schaper said there was an open invitation for healthcare professionals whether primary care, hospital-based or allied health, rural and remote and others to learn more about the workplace of the future by attending HIC 2015, the annual conference in Brisbane 3-5 August.

She said more than 150 speakers would be presenting on global trends, new research, new technology and success stories– all in the rapidly developing health tech field broadened to be known as eHealth and digital health.

One keynote speaker in particular has an international reputation in health workplace change.

Dr Schaper said HISA was pleased to welcome one of the United Kingdom's leaders in health reform Dr Helen Bevan who would be a keynote speaker at HIC 2015.

Dr Bevan, Chief of Service Transformation at the National Health Service, where she has led large scale change for more than 20 years, will address more than 1,000 delegates on system reform.

"Dr Bevan is known globally for her ability to achieve healthcare transformation and she provides advice, guidance and training to leaders of health and care systems across the world," Dr Schaper said. "This is a rare opportunity for Australian executives, managers and everyone involved in healthcare professions to hear from a distinguished leader."

"The momentum behind eHealth and health informatics is soaring and there is much international attention being focused on the entrepreneurial digital health community in Australia - our research, developments and implementations," Dr Schaper said.

"Health informatics may still be a 'young' field, but we are making great headway into the many aspects of eHealth that are transforming the delivery of healthcare to achieve improved health outcomes for all Australians," Dr Schaper said.

How to become a HISA member

Dr Schaper said one of the ways hospitals and healthcare professionals could learn more and prepare for the future was to join HISA and take advantage of the benefits of membership. State branches meet regularly and national events were a further opportunity for networking, career development and learning.

"We welcome healthcare and health IT professionals at all levels and from all disciplines," she said. "Our digital health community is 10,000+ strong and growing. Our members include Australia's leading digital health, eHealth and health innovation experts – all committed to the transformation of the health system."

"You are invited to start your personal and professional journey with HISA - your digital health community," she said.

Find out more by visiting www.hisa.org.au or call **(03) 9326 3311**. Email **hisa@hisa.org.au** Twitter **@hisa_news**

ABOUT HISA

HISA is Australia's peak body for the diverse and multi-disciplinary digital healthcare community.

Members in State branches include healthcare professionals, from clinicians to nurses, surgeons and hospital executives along with academics, researchers, industry leaders, vendors and digital health entrepreneurs.

Together they share the national vision to improve Australian healthcare through digital health and health informatics.

HISA members have a voice in shaping the future of healthcare by becoming an influencer on topics like: the health workforce agenda, integrating care, digital disruption and new business models, virtual healthcare, data analysis, participatory health and key emerging issues. Join HISA at **www.hisa.org.au**

DR LOUISE SCHAPER CEO HISA

As leader of Australia's peak professional organisation for digital health, Dr Louise Schaper is a renowned advocate for the transformation of healthcare through technology and information.

With her passion for innovation and commitment to entrepreneurship, she has achieved a global reputation in the rapidly evolving field of health informatics. Louise sits on the Advisory Board for the Stanford Medicine X conference, is a National EHealth Transition Authority Clinical Leader, previously chaired the EHealth International Advisory Group of the World Federation of Occupational Therapists and is a graduate of Stanford University's Executive Leadership Program.

Don't miss the first Hacking Health

While you are at HIC 2015, don't miss the first Hacking Health event. Healthcare experts, designers, developers, engineers, patients, consumers and mentors are working together to collaborate and co-create solutions and digital health prototypes to pressing healthcare challenges.

HISA is partnering with Hacking Health an internationally recognised Canadian-based group who share our vision to foster collaborative, cross-disciplinary relationships that lead to significant innovation which improves healthcare outcomes.

Hacking Health is designed to improve healthcare by inviting technology creators and healthcare professionals to collaborate on realistic, human-centric solutions to front-line problems.

Hacking Health @ HIC is fun, intense and hands-on, with small teams tackling tough problems in a supportive community of peers and mentors.

Don't miss this event at HIC. Find out more by visiting **www.hisa.org.au/hic2015/hackinghealth/**

Quality Improvement Tools and Tactics – What's New from the World's Best

What are the global leaders in healthcare doing to maintain their cutting edge? How do they continually top benchmarks in clinical indicators and patient experience and stay ahead of competitors?

With 375 of the 414 Magnet accredited hospitals, 14 of the 19 Malcolm Baldrige quality award winners and 15 of the 17 Honour Roll hospitals as clients, Press Ganey is in a unique position to provide insight into what makes these organisations, such as The Cleveland Clinic and Johns Hopkins Hospital, the best of the best.

The short answer: an unwavering commitment to ensuring the patient is at the centre of all strategy development. Sure, everyone has this mantra on the wall in the hospital foyer, but high performers truly execute patient-centred care. It starts with the CEO as the agent of change and cascades throughout the organisation. Many strategies are employed, but two new tactics are now being embraced by high performers:

1. Benchmarking clinical indicators, not just as a score card, but as a driving factor in improvement, being average is just not acceptable; and
2. Immediate patient feedback and service recovery – before a patient leaves hospital.

Benchmarking of Clinical Indicators NDNQI

By accessing an international database for examining relationships between nursing and patient outcomes, high performers use NDNQI to deliver evidence to support the importance of investments in nursing strategy. As the leading nursing quality improvement program, NDNQI (managed by Press Ganey) advances the vital efforts of nurses to help achieve higher quality, more coordinated care through a robust international database of 18 nursing-sensitive quality indicators and leading job satisfaction and practice environment RN surveys. The evidence for patient outcomes is overwhelming. Participants in NDNQI have recorded improved patient outcomes:

- 87% reduction in infection rates (over 2 years)
- 59% reduction in hospital acquired pressure ulcer rates (over 2 years)
- 17% reduction in injury falls (over 4 years)

"At a time when the health care industry is moving from volume-based care to value-based care, the ability to understand nursing quality indicators and retain valued nursing staff has never been more critical," said Christy Dempsey, Chief Nursing Officer at Press Ganey. Nurses are at the forefront of the mission to reduce the adverse impacts of medical treatment and systemic breakdowns in care delivery.

Why do High Performers Utilise NDNQI?

Participating hospitals use NDNQI to measure nursing quality, improve nurse satisfaction and strengthen the nursing work environment. NDNQI features measures to monitor relationships between quality indicators and outcomes. With powerful unit-level data, NDNQI assists high performers in action-planning and intervention for specific units needing improvement.

Recognised as a leader in performance improvement for over 30 years, Press Ganey partners with more than 11,500 health care organisations worldwide, (including over 500 in Australia and New Zealand), to create and sustain high-performing organisations. Press Ganey sought feedback from 106 million patients in 2014, data used to focus the development of leading-edge solutions that truly impact on the patient experience. In keeping with this mission Press Ganey acquired NDNQI, the recognised gold standard for nursing quality data and a proven solution that addresses the vital role of nursing in coordinated models of care. Since acquisition in June 2014, the database has increased to over 2,000 hospitals internationally, including 98% of Magnet accredited hospitals and is the largest provider of unit-level clinical performance data to hospitals. High performers continually challenge their own performance and NDNQI facilitates this process.

Participation in NDNQI is as simple as going to: **solutions@pressganey.com.au** and requesting access to an on-line registration process.

Patient feedback in real time for focused improvement tracking and immediate action

To drive performance, high performers do not wait until negative or sub-standard experiences have occurred to learn from them. They obtain real-time feedback to drive immediate intervention while the patient is still receiving care. This means targeted information — focusing on specific issues in specific areas — to allow for real-time action with specific patient cases, as well as identifying root causes to reduce recurring problems.

Many high performers have chosen Press Ganey's **Point of Care**™ solution because it provides healthcare organisations with immediate feedback from patients and their families, empowering staff to action important interventions immediately and address concerns in real time, before it is too late and the patient has left their care.

Press Ganey's **Point of Care**™ solution is a significant leap in technology from other systems available in the industry. The unique alerting function electronically notifies the right staff as soon as a negative response to a question item is submitted. For example, if patients don't understand their medications, pharmacy can be alerted to proactively respond and address medication safety and education for the patient prior to discharge.

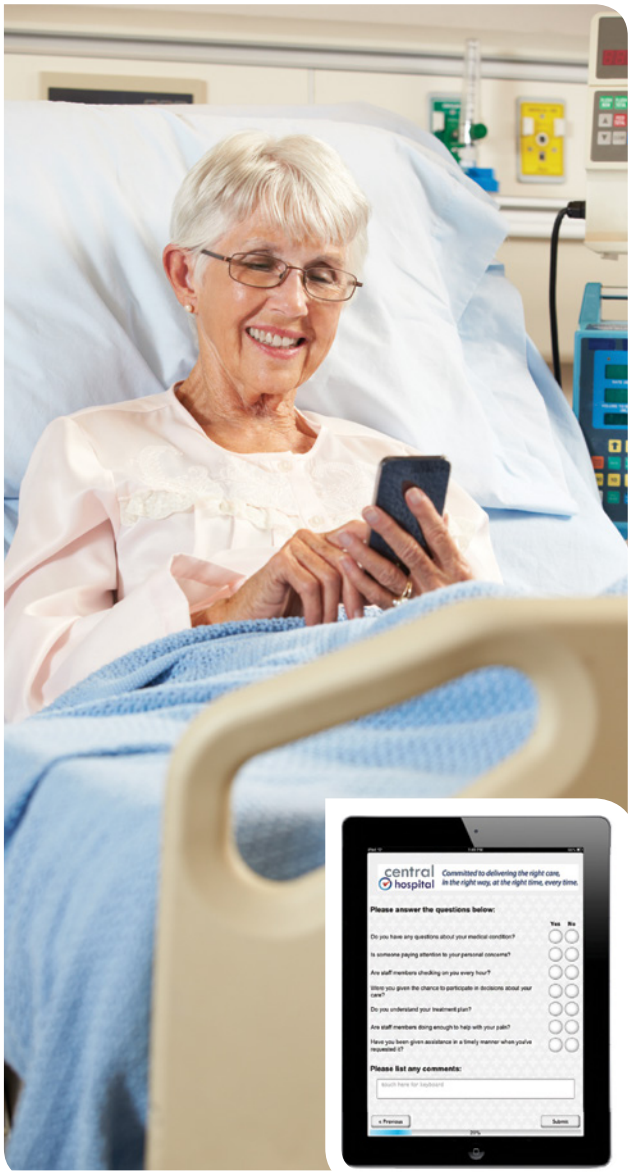
Insights from Press Ganey's **Point of Care**™ solution complement scientifically robust, post-visit patient experience surveys and broader analyses of the entire patient experience, building upon those for more focused evaluation.

High performers use various forms of performance measurement metrics that they use to monitor the success of their **Point of Care**™ solution. Developing multiple ways to measure the desired behaviours and utilising a layered approach creates the greatest opportunity to capture a well-rounded picture of their processes.

An example is purposeful patient engagement or rounding, which is a validated best practice for improving the inpatient experience. A consistent approach to measure and monitor patient engagement activities can ensure effectiveness, give patients an expanded voice and allow for service interventions to ensure expectations are met.

Patient Engagement Example: What Gets Measured Gets Done

1. How often did nursing staff come in your room and check on you?
   - O Every Few Hours
   - O Every 2 hours
   - O Every hour



Managers and/or leaders at high performing facilities visit their units and departments to see how patient care is being delivered and ask patients directly if they are receiving, not just excellent clinical care, but also compassionate, connected care, the real key to improving the patient experience.

High performers also use PG's **Point of Care**™ solution to conduct regular audits of care like hand hygiene practices, track measurements and share results with staff so that they can see improvements. Other important metrics they track for validating patient engagement are the number of call lights that are being tracked, number of patient falls and even discharge call processes. They then watch their scores improve as communication is becoming more and more effective.

A key benefit of the Press Ganey **Point of Care**™ solution is that it is housed in the 'cloud', so no special, expensive devices need to be purchased and patients and families can use their own smartphones or tablets to confidentially give feedback without having to go to a single gadget at the nursing station, a kiosk or download any app.

»

To get more information on the Press Ganey Point of Care solution contact: **solutions@pressganey.com.au** or visit **www.pressganey.com.au**

By Terry Grundy, Managing Director, Press Ganey Australia and New Zealand

COVER STORY

Talking eHealth

with Dr Yvette Blount

Sophie Blackshaw talks eHealth with *Dr Yvette Blount*, Research Coordinator for the Australian Anywhere Working Research Network and Lecturer for Macquarie University's Faculty of Business and Economics. Dr Blount is an expert on how telework provides organisations with sustainable competitive advantage by enhancing service quality. →

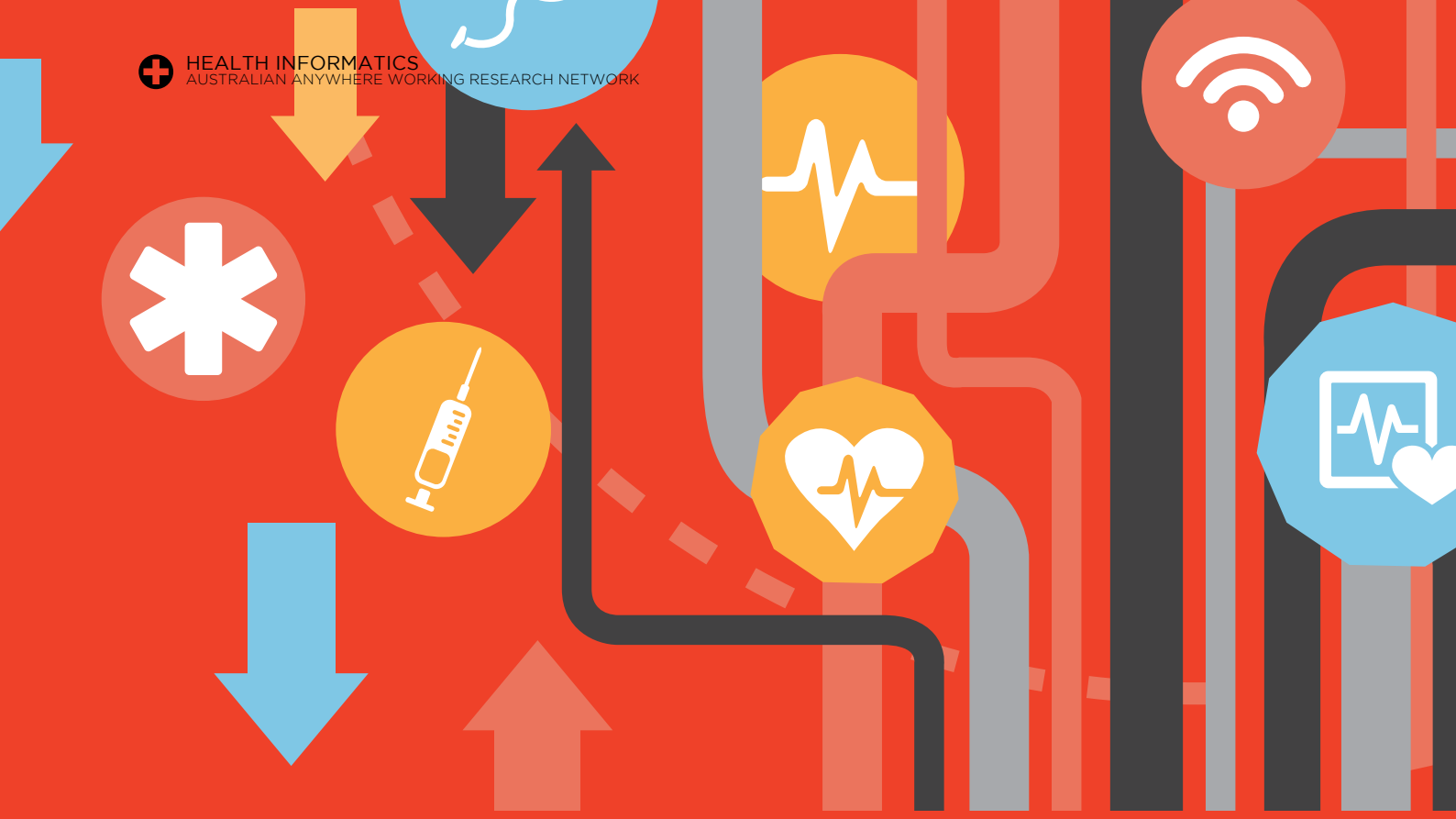
Dr Yvette Blount

Research Coordinator for the Australian Anywhere Working Research Network and Lecturer for Macquarie University's Faculty of Business and Economics

Dr Yvette Blount focuses her expertise on how telework provides organisations with sustainable competitive advantage by enhancing service quality and the implications for employee management when implementing new technologies in the service sector.

Her current project *Connected Care*, sponsored by Macquarie University Centre for the Health Economy, investigates the delivery of telehealth services and the implications for service quality, productivity and wellbeing of the clinical health professionals that deliver telehealth.

Dr Blount's research program employs a multidisciplinary approach to investigate how information systems are utilised by organisations to achieve their business objectives.



How do you define eHealth? How does it differ from telehealth?

There are a number of terms and definitions relating to this area. Some terms include eHealth, telehealth, telemedicine and mHealth.

eHealth includes all uses of information and communications technology (ICT) in delivering healthcare. Tele from the Greek means 'at a distance.' Therefore telehealth is healthcare delivered over a distance and is a subset of eHealth. Telehealth includes preventative (for example screening, immunisations, genetic testing), promotive (healthy lifestyles and wellbeing) and curative healthcare (diagnosis and treatment of a medical condition) delivered over a distance. Telemedicine is the curative aspect of telehealth (a subset of telehealth). mHealth includes eHealth, telehealth and telemedicine using mobile devices. There is some disagreement as to whether mHealth is an appropriate term because it focuses on the technology instead of healthcare delivery.

How do you believe the new system will improve on the current one?

As for any information system, and particularly in this context, the data needs to be accurate. The data also needs to be timely. If the data is out of date then it will not be useful for either the clinician or the patient. The data needs to be complete. If there is data missing from the patient's record, the clinician will not be able to make appropriate decisions relating to the care of a patient.

If the information is not accurate, timely or complete it will effectively be useless regardless of whether this is an opt-in or opt-out process. Doctors are not using the system according to reports (see https://ama.com.au/ausmed/1bn-e-health-record-system-shunned). Secondly, if patients can choose what they disclose the PCEHR the health record will not be complete and therefore not very useful for clinicians to make healthcare decisions.

How will eHealth affect the role of medical professionals?

The first issue is whether or not health professionals believe the PCEHR will benefit them and their patients. This is not a technology issue per se. There are a number of issues that relate to the quality of the information and privacy - who has access to the data? Who checks the accuracy of the data? How are the inaccuracies corrected? Who is responsible?

In a review of the implementation of the EHR in the United States, healthcare providers did not believe that care disparities were reduced or that the accuracy of information about patients was increased. The perception from clinicians/providers was that the EHR increased workload and reduced productivity because of the additional reporting requirements. That is, clinicians believed that using the system diverted attention away from treating patients[1].

How do you think PCEHR will affect doctor-patient relations?

If clinicians believe that the PCEHR does not contribute to better patient care/outcomes or takes them away from quality interactions with patients, it is difficult to see how the PCEHR will be adopted in a sustainable way. The questions that need to be addressed here are how/when/where is the data entered? For example while talking to the patient or after the patient has left? How can the data entry be efficient? How can the doctor find the information he/she needs to communicate with the patient? The design of the PCEHR should consider all the needs of the stakeholders.

What are the 'appropriate healthcare services' that people in remote, rural and disadvantaged communities will have access to?

Telehealth is one way of providing access to specialists and other health providers that a patient in remote, rural or disadvantaged communities may not otherwise have access to. The patient may have difficulties travelling to see a specialist because of cost, health, family or community constraints (and also may be on a long waiting list). Telehealth potentially can provide more equitable access to health services. Recent Australian research reveals rural patients wait, on average, twice as long to see a general practitioner compared to their city counterparts (>6 days compared to 3 days), and in some regions wait four times as long (>13 days)[2]. People living in rural areas "are more likely to have cancer, diabetes and heart disease", "die two and a half years earlier", "get 12.6 million fewer Medicare services, 11 million fewer prescription medicines and $800 million a year less dental and allied health care" and "as a result, they are 30% more likely to end up in hospital as a result of an avoidable cause than people living in cities" [3] (p1).

To what extent will eHealth incorporate social media? If the answer is a lot, what portion do you think will be government controlled or privately run?

eHealth already incorporates social media to some extent. Many organisations (examples include those supporting breast cancer and ovarian cancer, mental health organisations; the Cancer Council; QLD Health; NSW Health; the Commonwealth Department of Health) use Facebook, Twitter and other social media channels to provide information and to promote healthy lifestyles. Social media channels are being used by both government departments/ agencies and private operators.

If consumers are able to seek advice or treatment from clinicians through the web, how will the fees system work? How will changes to fees be approached?

The funding/business model is critically important because clinicians still need to be paid and patients need to be able to afford the services. The funding model is unclear although the Commonwealth and state governments, health funds, technology providers and patients are key stakeholders.

Do you think the government is doing enough to implement the eHealth system in a timely manner?

The implementation of an eHealth record is not just an issue Australia is grappling with. The adoption of eHealth records is being attempted in many countries with varying levels of success. The PCEHR has predominantly been driven by technology rather than the clinical problem. It doesn't appear to be a question of timeliness, more a question of usefulness. How does the PCEHR support a clinician in providing better quality care? What are the benefits for patients? Have all stakeholder views been considered?

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Thomas M. Lee

HISA invitation to hospital and health professionals:

Be prepared for the new digital health workplace

If you work in a hospital, whether as medical professional, nurse or midwife or allied health professional, you are already experiencing the tides of change. From electronic patient health records to bedside workstations and patient entertainment consoles, the digital world is going to change the way you work.

As a hospital and health professional who wants to learn more, you need to hear it from your peers already working through the issues and challenges who can share their knowledge in language you understand – improved patient outcomes, as well as quality, safety and privacy.

Australia has a peak organisational body for healthcare professionals who want to learn more about the new digital health workplace – HISA (Health Informatics Society of Australia) – www.hisa.org.au

HISA started 23 years ago with a focus on health informatics. Today it is one of the fastest growing not-for-profit healthcare peak bodies with members right across the health spectrum: nurses and doctors, specialists, health IT workers, administrators, policy makers and executives.

HISA will hold its annual conference HIC this year in Brisbane (3-5 August) and all hospital and healthcare workers are invited to attend and hear from the healthcare service administrators, medical practitioners, nurses, policy makers and decision-makers driving digital health in Australia.

The HIC conference can provide you with awareness and deeper understanding of digital health and how it will impact your workplace.

Set on the theme "Driving Reform: Digital health is everyone's business", the conference brings together the whole digital health community.

Keynote speakers, both local and international, are always high calibre and bring new information on global trends and issues. This year the United Kingdom's health reform leader Dr Helen Bevan will attend HIC to speak on system reform. Dr Bevan is acknowledged globally for her expertise and ability to translate it into practical action and deliver outcomes. She provides advice, guidance and training on transformational change to leaders of health and care systems across the world.

Delegates will also discuss reform through participatory medicine – the sharing of information and decision-making with patients. HIC will feature keynote speaker Thomas M. Lee, the co-founder of Symplur the social media company who will speak on the role of social media in healthcare and its importance to patient outcomes.

There are three special events during the conference – for the nursing community, for digital hospital design and for aged care.

In addition, dozens of latest academic, scientific and industry research papers will presented by Australia's leaders in digital health.

One of the reasons hundreds of HIC attendees return every year is the opportunity to meet and connect with Australia's largest digital health network. A gala dinner for delegates provides the setting for prestigious awards including the Don Walker awards for the best industry/clinical abstracts. The Branko Cesnik Award for the best academic/scientific papers is presented at the closing session.

In a new addition to HIC, HISA is partnering with Hacking Health an internationally recognised Canadian-based group who have run similar events in Canada, Paris, Stockholm, London, Milan, New York and Berlin. Hacking Health is a mini-event during the conference designed to improve healthcare by inviting technology creators and healthcare professionals to collaborate on realistic, human-centric solutions to front-line problems.

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For information on registering for HIC or being part of the Hacking Health event go to **www.hisa.org.au/hic2015**

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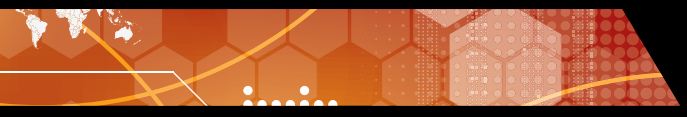

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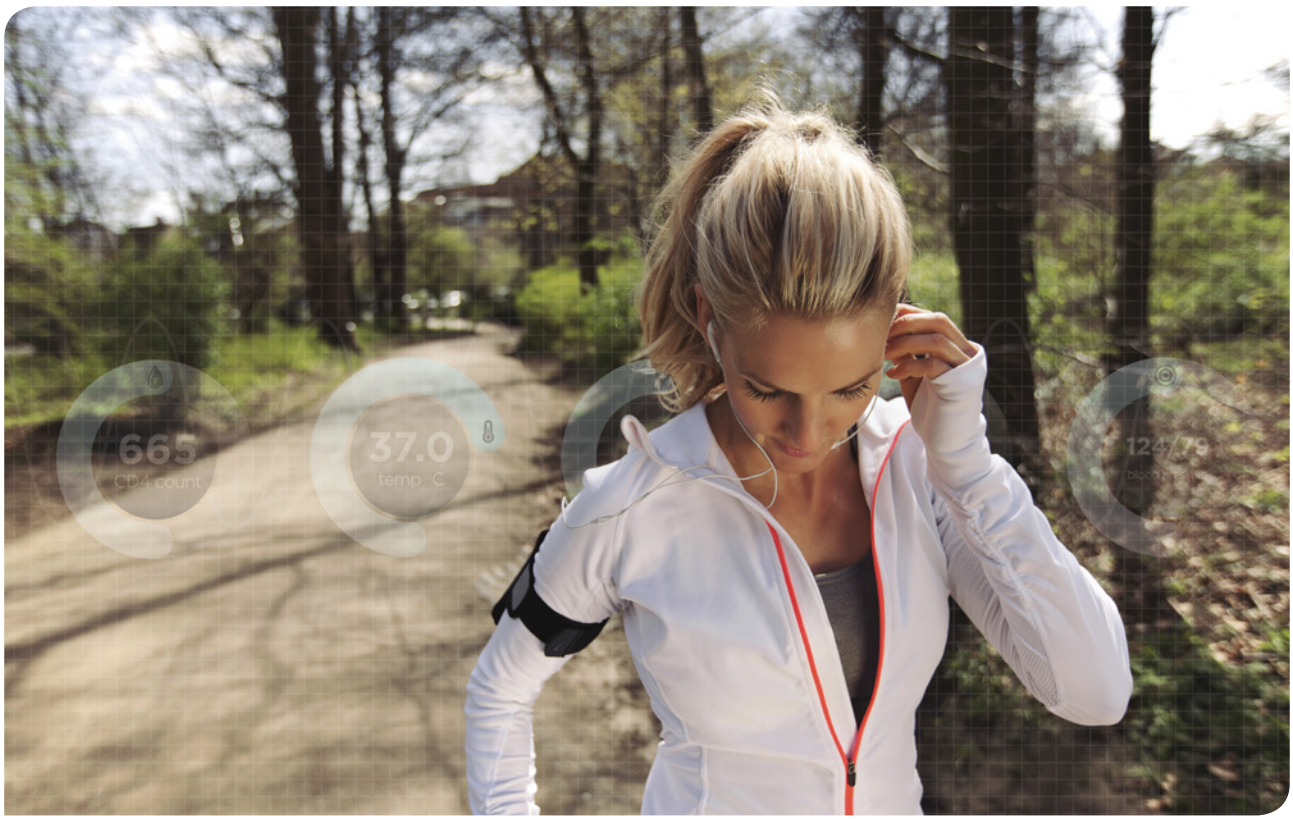


Improving patient healthcare outcomes with Population Health Management

As healthcare providers struggle to improve services while keeping a lid on costs, many are turning to the concept of Population Health Management for help.

Synonymous with a range of terms including clinical integration, public health and value-based care, Population Health Management (PHM) involves the use of aggregated and analysed data to deliver targeted care to individuals and groups.

However true PHM means much more than simply applying advanced analytics to achieve lower costs and improve outcomes. It also means providing secure access to accurate, complete health records, and coordinating care to ensure the best possible outcomes for patients.

The growing data deluge

The healthcare sector is awash with data - and levels are quickly increasing. Electronic patient records, specialist reports and patient reported data is growing and becoming a management challenge for care providers. It's "big data" on an epic scale.

This situation is going to become more acute with the rise of wearable consumer devices. Designed to collect everything from temperature and heart rate to blood sugar levels and other vital signs, these devices will create another large stream of data that needs to be collected and analysed.

For care providers, the challenge of clinical integration becomes significant. How can all these disparate sources of data be collected and analysed to improve patient care? On a wider scale, how can this information be used to track health trends across larger population groups?

Some in the sector believe a centralised electronic health record (EHR) is the answer. They see this as a single repository in which all patient data is stored and accessed as required.

However, this approach won't work within this growing data deluge. EHR systems are not designed to accept data coming from multiple sources and in multiple formats. Their ability to combine, for example, patient reports with sensor-based data from wearable devices , or unstructured data from clinical images, is limited at best.

The promise of Population Health Management

The solution is the introduction of a more dynamic patient record which can cope with data from many sources and in different forms. These records work for care at an individual patient level but can also be aggregated to allow analysis of trends at a group and community population level.

This is the real promise of PHM - the ability to apply modern analytics to data drawn from an entire population to help all its members enjoy an active and healthy lifestyle.

To achieve this goal, it's essential for providers to undertake six critical steps. By following this process, the true benefits of PHM will be realised. The steps are:

1. Acquisition

Throughout the healthcare sector, vital data resides in a wide range of internal and external disconnected systems. Different electronic patient records and other clinical systems store and share data in different ways. This complexity is multiplied when data is also brought in from practice management systems, claims systems and patient monitoring devices. Acquiring all this data and storing it in a single secure location is vital.

2. Aggregation

Each of the myriad systems providing data for a PHM system contributes to it in a different format. Even common electronic patient record systems often alter their data formats from version to version of the software. These differences become even more dramatic when you start to bring in data from labs, health plans, pharmacies and tertiary care sources. Having an effective data aggregation structure in place is key to ensuring the correct information is associated with correct individuals and organisations.

3. Access

Because there are multiple stakeholders involved in the management and operation of any healthcare system, each will require secure access to various portions of the data contained with the centralised PHM system. Stakeholders include healthcare providers, administrators, management professionals, patients, family members and insurers. Each group will require its own unique set of priorities and permissions. Various levels of technical and clinical sophistication also need to be considered.

4. Adoption

Every stakeholder in the healthcare process requires access to patient data that provides an accurate and up-to-date picture. However, often there is a deep resistance to change and getting stakeholders to alter the way they have been operating can be challenging. The issue of adoption is both a technical and behavioural one and also one of 'chicken and egg'. If clinicians and care coordinators fail to adopt the new systems, key information will not be used for decision-making and outcomes will suffer.

5. Analytics

Analytics is where the real value of a PHM system lies. By mining the collected data, healthcare professionals can gain insights into a population's health that previously would not have been possible. Actionable insights can be discovered that drive improvements in quality and efficiency of care, while at the same time keeping up with ongoing and ever-increasing regulatory reporting requirements. Together with efficient acquisition and aggregation, analytics allows those involved to act on data in very powerful ways.

6. Action

Collecting and analysing data is important, however the most critical step is using the insights gained to take action. Naturally there is a risk that having too much data and too many ways to use it can become overwhelming and result in little progress. For this reason, it is important to put in place a robust infrastructure that supports effective data-driven actions. This can be achieved by providing care providers with the tools and information they need to add value.

Putting PHM to work

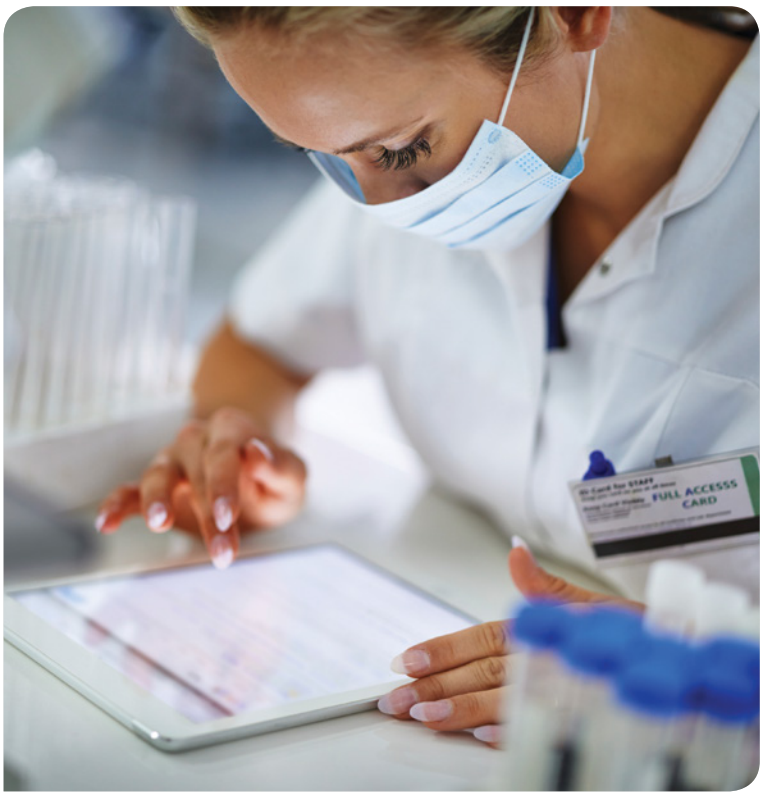
Orion Health has been working with stakeholders across the healthcare sector to develop and deliver the systems and infrastructure that underpin PHM. Built on a robust architecture, the Orion Health Open Platform scales to deal with massive data derived from multiple and varied sources.

By continually liaising with healthcare providers and understanding the ways in which they can use data to improve the services they provide, Orion is dedicated to ensuring the full promise of PHM is realised.

Hacking for Better Health

healthhack.com.au

The healthcare sector has much to gain from the new developments in eHealth and soaring popularity of lifestyle apps contained in mobile and wearable devices. The question is, what to do with this data to help patients? A community of IT enthusiasts have come together to help connect the dots via a national hackathon writes *Dr Maia Sauren.*



What is a hackathon?

"Hacking" is the (legal) process of creative problem solving. A hackathon is an event where people come together to collaboratively solve problems, often using software or other technologies. You might have heard it described as a hackday or a codefest.

What happens at a hackathon?

Participants typically form teams of 2-5 people, gather their laptops, and work on finding solutions to a problem. The event might run for a few hours or a whole weekend. Often participants compete for prizes, either as money, goods or simply prestige.

The problems may be predefined or brainstormed at the start of the event. The focus is on usually centred around iterative prototyping and innovative solutions.

A hackathon can be a platform for people to show off their skills, launch new research projects, seek alternative opinions on an existing problem, or simply grow and fertilise the community.

This model has been so successful that in recent years, companies such as Commonwealth Bank, Realestate.com.au and Fairfax Media have begun holding internal, external and mixed hackathons. These are used as a way to kickstart innovation or connect staff from different areas. Prizes range from 'tech toys' such as Chromecasts to tens of thousands of dollars.

The outputs may not always see the light of day, but they're always valuable.

So, what sort of a hackathon is HealthHack?

HealthHack is a weekend hackathon designed to address some of the problems faced by the Australian health sector. It brings together biomedical researchers, clinicians, bioinformaticians, software developers, data analysts, designers, storytellers, and graphic artists.

It has the double advantage of demonstrating the power of new software technologies to scientists and clinicians, and getting the software community involved in healthcare.

Starting with the questions "What about your job makes you cry?" and "What do you wish you could do?", HealthHack organisers work with problem owners ahead of time, narrowing down interesting projects suitable for tackling over a weekend. The scientists and clinicians participate over the weekend, working with a multi-disciplinary team to find solutions that address their specific needs and processes.

Some HealthHack outcomes

The kinds of problems tackled by HealthHackers have ranged from innovative visualisations of scientific publications, to better models of life expectancy calculations for Aboriginal and Torres Strait Islander people, to a quality assurance tool for genomic data assessment.

Although the main output of HealthHack was open products to assist health researchers, there was a secondary output, just as important: networks built across communities. The participants on many teams have remained in contact, and even continued discussions with researchers on how to better the tools they created over the weekend.

Dr Ben Fulcher And Dr George Youssef of the Psychology department at Monash University came away from HealthHack with not one but two mobile apps, Android and iOS (Apple), for tracking gamblers' addictive behaviours and moods.

This project is the first of its kind in the field of Psychology. Gamblers' behaviours are often assessed months after the fact at a clinical setting. This doesn't allow people the ability to recognise their own addiction. The apps allow users to track in

real time how their mood and environmental factors interact with their problem behaviours, allowing the demonstration of what is going on as well as opening up whole new paths of research.

The broader Psychology department are impressed with the results. They have been disappointed with previous projects in which $50,000 and several months buy them a mediocre product, inferior to what came out of a single weekend at a hackathon.

Developers Bec Martin and Andreas Limberopoulos agreed to continue working on the Android version of the app, on the understanding they will be hired to continue working on it when further funding is obtained. The app is now at a stage where the researchers will begin trialling it with a small number of patients.

Having submitted a grant application a week before HealthHack and missed out by a hair's breadth, the researchers are confident they will now be able to secure new lines of funding.

First prize winners of Melbourne's HealthHack 2014, team VizMyGrant's web application demonstrates where National Health and Medical Research Council grants are allocated. This tool breaks down the numbers by institution, grant type, gender and career stage of principal researcher.

The app has been a hit with the NHMRC, who are keen to make their data more accessible. NHMRC staff have been in conversations with the researcher spearheading VizMyGrant, Dr Marguerite Evans-Galea of the Murdoch Childrens Research Institute, about how to release their data in future in a more accessible format for better, faster visualisation and analysis.

Dr Evans-Galea had spent months collating the original data from spreadsheets and PDFs from the NHMRC site.

How could this help me?

GovHack, an annual weekend hackathon dedicated to exploring what's possible with open government data, has spawned $50 million startups, council portals, community projects, and a complete overhaul of the way government interacts with citizens, and citizens with government.

With wearable technologies and computational tools becoming more accessible, the kinds of problems that might be addressed at hackathons are limited by imagination. Anything from improving electronic medical records to tracking rehab patients' movement via embedded cameras is up for grabs.

Want to be involved?

HealthHack will be running in 2015 over the weekend of 23-25 October in Melbourne, Sydney, Perth and Brisbane. If you have a problem you think might benefit from fresh input, the HealthHack organisers would love to hear from you: **info@healthhack.com.au**

Why hackathons?

There are many types of hackathons, and many reasons to be involved. To name a few:

- learn or showcase out a new technology
- build an application to fill a niche
- tell a story or highlight a public issue
- prototype a new product with a view to commercialisation
- run a hackathon alongside a conference as an alternative engagement stream

2014 HealthHack Projects

Gambling Behaviour Tracker

Problem: www.healthhack.com.au/locations/melbourne/challenge4/

Team page: https://github.com/HealthHackAu/HealthHack2014/wiki/girror%3A-tracking-your-emotions-and-gambling-behaviour

VizMyGrant

https://github.com/HealthHackAu/HealthHack2014/wiki/VizMyGrant
https://viz-my-grant.shinyapps.io/view/

Dr Maia Sauren is a biomedical engineering researcher turned software consultant. Maia is a co-chair for Open Knowledge Australia, a not for profit that aims to help organisations make data and information available and open. She tweets as @sauramaia.

Improving patient care through safe effective staffing

There are two pressures facing almost all developed healthcare systems. The first is the need to improve the quality and outcomes of patient care and the second is the requirement to manage tighter budgets and cost savings programmes.

Yet when it comes to managing the healthcare workforce, history is littered with examples of organisations treating these two pressures of managing quality and cost as competing demands. This seems like a missed opportunity when we consider the workforce uniquely represents both the largest single cost for healthcare organisations as well as the frontline for quality care delivery.

The idea that investment in quality initiatives can contribute to savings or better productivity is not new. It's just that all too often organisations approach workforce optimisation projects such rostering solely as a cost saving project, rather than a quality improvement programme that can free up staff to deliver better quality care, reduce negative outcomes and unlock savings at the same time. While subtle, the difference in emphasis reflects a misconception that increasing the quality of patient care will always lead to an increase in workforce costs, while reducing staffing costs will lead to a decrease in patient care. What this misconception fails to address, however, is that the savings made by ensuring you deploy your permanent workforce in such a way that ensures you have the right people, in the right place at the right time can have a positive impact on patient care, and productivity.

At Allocate this means e-Rostering is as much about matching skills and numbers of staff to patient needs as it is about managing time and attendance. It is about empowering frontline staff so that they are freed from unnecessary admin, releasing more of their time to care. It is about using the permanent workforce effectively, reducing spend on agency staff. To do this it is essential senior teams have a deep understanding of where the workforce is deployed effectively and where there are still inefficient practices.

As workforce legislation and industrial awards in health operate at a state level rather than under a single national framework, in-hospital practices vary throughout the country. One thing all hospitals do have in common though, is the major expense of their workforces and it is our experience that there are some common areas for executives to focus on to uncover what is working and where, as well as what isn't and why.

The first step is to increase transparency into budget, leave, overtime and skill-mixes.

A recent Allocate Software roster assessment of hospital wards found that poor visibility into staff availability, employee skills and award constraints were common. In one assessment of a seven-day period, Allocate discovered that despite 68 unnecessary extra shifts being assigned, 10% of the duties necessary to meet patient needs weren't fulfilled. The organisation had rostered additional staff, which increased costs, yet failed to deliver the skills to ensure improved patient care. While this was not intentional, the lack of visibility into staffing and skill gaps made effective rostering much more difficult.

Without sufficient visibility into staff availability, organisations can overspend on unnecessary shifts, agency staffing and excess overtime. Improved visibility enables the rostering manager to cost a roster as it is being created as well as evaluate the quality of the roster in terms of quality and safety. This provides the opportunity to evaluate and improve the roster, before incurring avoidable costs or unacceptable risk. Through recommended changes to rostering practices, the above-mentioned organisation saw a 49 per cent reduction in overtime, a 95 per cent improvement on the accuracy of leave entitlement recording and a 15 per cent reduction in agency costs. Each department also saved 16 hours per week in roster creation and administration. This illustrates the substantial effect that efficient staffing can have on the bottom line.

Poor workforce management can have a major financial impact on any industry –but in healthcare, the stakes extend beyond economics. A poorly managed workforce can have an unacceptable effect on patient care.

So what are the signs that an organisation is missing the opportunity to use workforce optimisation and e-Rostering as both a quality and productivity programme? Well these can vary, but board members are encouraged to pay attention to projects that solely focus on time and attendance or awards interpretation and instead ensure your programme uses these key elements as a foundation for patient demand driven staff deployment.

By enhancing visibility into staffing practices, skill-mix and budgetary implications, organisations can move beyond rostering for availability, to staffing based on clinical demand and required skills. This not only helps meet compliance and audit goals, but leads to higher quality patient care and improved patient outcomes.

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3M helps to solve healthcare challenges in clinical documentation, coding and reimbursement and electronic record management.

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Health Information Managers use 3M Health Information Systems to support activities and processes specific to the harnessing of complete and accurate clinical data.

3M™ Codefinder™ Software is a leading clinical Coding, Grouping and reimbursement tool that helps Clinical Coders to translate clinical documentation into accurate ICD-10-AM/ACHI codes. 3M Codefinder has real-time quality edits that alerts Coders to potential Coding issues, thereby improving the quality of the data output and reducing the amount of re-work required. Reference tools and Code specific notes provide information and support where and when it is required.

3M™ Grouping software ensures coded data is grouped to the correct Australian – Refined Diagnosis Related Group (AR-DRG), ensuring that patient data is accurately reported to Government, Insurers and research agencies.

3M™ Computer Assisted Coding Systems can accelerate the coding process by highlighting key clinical terms required to code a patient episode, reducing the time required to read patient records.

3M™ Clinical Documentation Improvement software can be used to highlight deficiencies in clinical documentation, potentially improving reimbursement and patient outcomes.

3M™ DRG Assurance™ Program helps hospitals improve patient outcomes through the promotion of complete, specific and accurate clinical documentation resulting in a positive effect on ICD-10-AM code assignment, DRG assignment and ultimately all downstream reporting and data uses. 3M DRG Assurance is a 3 phase consulting program where 3M health information experts first review existing medical records to identify improvement opportunities, then provide education to close the gap through improved communications between clinicians and coding professionals, and finally provide follow up and performance monitoring to ensure ongoing performance.

3M Health Information Systems is supported by a local ANZ team comprising qualified Health Information Managers and Coders, and a local Technical Support team, all backed up by 3M HIS global team.

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Can Telstra have a Significant Impact in eHealth when So Many Others have Failed?

Everyone in Australia recognises Telstra as the previously Government-owned telecommunications monopoly that was privatised a little over a decade ago, while being opened to competition. However it has still remained the dominant provider of fixed line, internet and mobile services while at the same time expanding its reach as a provider of cloud services and also increasing its role as a provider of support services to the National Broadband Network (NBN) for a very considerable sum. It is presently one of Australia's largest companies with a market capitalisation of more than $75 billion and annual turnover of more than $33 billion writes *Dr David More.*

Much less well known is that in the last 2-3 years Telstra has been steadily developing a presence in the eHealth space. At the time of writing (mid-April 2015) Telstra had made over 15 investments in eHealth related companies - many of which have been purchased outright - and has formed a separate operating unit termed Telstra Health.

You can read all about Telstra Health from this link:
www.telstra.com.au/telstra-health

What is interesting recently is that Telstra Health has, as it has made these acquisitions and formed its various partnerships, has begun to much more clearly articulate a business strategy and some business objectives. As a listed company we can be sure Telstra's motives are financial; not charitable.

They identify what they describe as a six-point strategy;

Our six-point strategy

We're focusing on key health segments and building an eHealth ecosystem to address six of the biggest challenges facing the Australian healthcare system.

- Consumer Control - Providing people with greater control of their health and wellness
- Connectivity - Increasing access to healthcare regardless of location
- Admissions - Reducing hospital and aged care admissions
- Integration - Improving integration of health information
- Pharmacy - Creating a safer, efficient and more convenient pharmacy system
- Efficiency - Improving efficiency and productivity across the system

With these in mind there does emerge a pretty clear and logical rationale for the various acquisitions that have been made - although I would have to say some have a much clearer basis than others. The good thing is that many of the acquisitions have been successful in their own right in delivering relevant and useful clinical and other support services and that many of the developers have been very much engaged in and understanding of the health sector at large. Sadly, in some ways, their size, and financial capability, has allowed them to 'pick the eyes' out of the best available in Australia which

outcome might just stifle innovation in the future.

As an observer of the eHealth space for now over thirty years I have seen all sorts of entities attempt to develop an engagement with the health sector and make a sustained and profitable (from their perspective) venture within the sector. It would be fair to say, I believe, that when considered over years, most organisations have run both hot and cold on the possibilities for them in the sector with very few, if any, being able to develop clearly sustainable and long term businesses, indeed before this present initiative Telstra has itself had different forms of engagement with the health sector over the last two or so decades. It is notable that the current push has considerable commitment at the level of the soon to retire CEO (David Thodey) who has mentioned eHealth frequently over the years as a significant growth engine for the company - with suggestions that the goal is to build a health / eHealth business with annual revenues of $1 Billion over the next five years. Clearly it is only at this scale could the goal of making a significant commercial difference be achieved. With that said it is clear Telstra has not been afraid to invest for growth in the sector with the announced venture / acquisitions clearly amounting to many tens of millions.

The key issue that flows from all this is just how they will be able to generate the sort of returns on investment and margins that a commercial entity requires. They clearly recognise - from these three paragraphs - that there may be some considerable challenges.

"We've seen what the digital technology revolution has done to meet challenges in other industries. We believe Australia's healthcare system can benefit significantly from a successfully implemented, connected eHealth system, reducing the reliance on multiple face-to-face interactions and removing an often siloed approach to care.

It's a huge job, so we're working with government, providers, patients and healthcare funds to deliver a connected future with improved productivity, safety, convenience, and quality control.

It's not about selling products, rather working with you to understand your challenges and develop solutions that will create brilliant new opportunities for Australia's health system. Our products are our capabilities and it's how we connect them, and the various parts of the system, that will make us truly successful."

Here is the link:
www.telstra.com.au/telstra-health/about/system-strategy-and-values

Many before them have noticed this potential opportunity and challenge but very few have succeeded!

If they are to succeed they will really need to develop deep expertise and relationships with the sector and be patient, while at the same time realising that success will only come from establishing truly stable and worthwhile revenue streams by offering services that are sufficiently differentiated and worthwhile that they will be valued. Initially I suspect they will be met with considerable scepticism and that their 'big business' character may be a barrier to successful engagement.

I noticed that in the recent announcement of the successful tenderers for the replacement of the Medicare Locals that Telstra Health was involved in the successful bid for the Brisbane North Metro Network. (Note eHealth is one focus of the new Primary Health Networks). Is this a pointer to at least part of how Telstra is seeking engagement (and revenue)?

Another pointer to the underlying strategic direction is the recent announcement of MyCareManager. This application is an eHealth solution for the aged and community care and disability sectors that includes a self-service portal and telehealth monitoring platform for clients. Here Telstra deploys both its network capacities as well as specific health functionality in a total solution package for a target market.

Read all about it here:
www.australianageingagenda.com.au/2015/04/17/integrated-home-care-solution-launched/

Another possibility to consider is that Telstra may be using Australia as a test bed for a range of Asian eHealth initiatives. If this is the case the complexity will rise but so also may the opportunity increase very considerably!

There is an interesting recent article from the leader of the initiative found here:
http://ehealthspace.org/news/telstra-s-shane-solomon-potential-ehealth

"We believe Australia's healthcare system can benefit significantly from a successfully implemented, connected eHealth system, reducing the reliance on multiple face-to-face interactions and removing an often siloed approach to care."

To me the jury is still out as to just how successful this initiative might be in the future but with Telstra's scale and reach anything is possible, think maybe the PCEHR *(ed: now re-launched as MyHealth)* being run in the cloud on Telstra's network, Telstra taking over provision of basic eHealth infrastructure services, provision of GP and/or hospital computing as a service or even taking over NEHTA. Some such outcomes are possible and I am sure can't be ruled out! I will certainly watching with interest.

Dr David More
Health IT Consultant

Dr David More is a Health IT consultant with more than 20 years' experience in the e-Health area. His blog can be found at aushealthit.blogspot.com and covers all matters e-Health. He may be contacted via the links provided on the blog.

Ensuring "Digital Health" with power quality and reliability

Today, technology touches the practice of medicine everywhere. From the simplest record keeping to the most sophisticated diagnostic imaging, technology is modernising how, when and where health care is delivered to patients. Reliable, high-quality electrical power is at the heart of that transformation.

The modern health care facility uses digital technology for imaging, order transmission, clinical notes and other aspects of the electronic health record. It has integrated supply chain and revenue cycle management.

Your facility, perhaps not digital today, will become an enterprise that uses fully integrated technology for communication, tracking and information flow. Your digital health care facility will be as paperless, filmless—and most importantly reliable—as your power system allows. Eaton's Power Quality solutions allow health care providers to deliver quality, reliable health care.

Health care facilities simply cannot afford interruptions in the power supply. From triage to treatment and follow-up, modern health care requires a safe, seamless and reliable supply of stable power. That's what health care providers, patients and their families expect health care facilities to provide every minute of every day. Managing a health care facility's power system to that high standard of reliability requires thought and planning. Keeping the power flowing in a health care facility means being prepared for the worst—like coping with the trail of injury and destruction left by the high winds and torrential rains of a hurricane.

When the unthinkable happens, communities turn to their health care facilities, which must be ready to respond. Additionally, maintaining reliable power means knowing how to handle the small, everyday threats to a power system. Power quality fluctuations lasting just milliseconds can jeopardise the data on a health care facility's network, or damage sensitive laboratory and research equipment. Power outages that last just seconds can compromise patient care and wreak havoc on clinical and financial networks as well as modality processes.

With today's technology demands, increased electrical load elevates power quality risks in health care facilities to new levels. Much is at stake for a patient, as well as for the physician, if medical operations are interrupted due to a voltage fluctuation, sag or power outage. Power abnormalities can result in corrupted and lost data, communication lock up, rebooting and permanent equipment damage. As hospitals become increasingly dependent on medical and information technologies to support everyday operations, the availability of clean and uninterrupted battery power becomes paramount.

Meeting the routine, everyday challenges— and the extraordinary, unexpected ones—requires a comprehensive view of the power system and careful integration of electrical equipment such as Uninterruptible Power Systems, Power Conditioners or Surge Protection devices that reduce risk and improve reliability and resilience.

Uninterruptible Power Systems (UPS) ensure clean, uninterrupted power to keep critical functions running until backup generators take over— whether that takes seconds or hours. If utility power fails, the power continues to flow without loss or surge. Data isn't lost and patient care isn't compromised.

Power Conditioning and/or Surge Protection equipment is designed to minimise damage to equipment when there are surges or sags in voltage on an electrical circuit. The protection device detects the anomaly and temporarily diverts surge current away from the equipment it's protecting, whether it's highly sensitive equipment in the lab or servers in the data centre. In most cases a combination of Surge Protection and UPS equipment is required to ensure the highest level of resilience for not only the protected equipment and

infrastructure, but also the UPS itself. Rely on these solutions to assure safe, high-quality and uninterrupted power for your health care facility.

Like any other enterprise, a health care facility invests in the buildings and equipment it needs to operate from day to day and keeping up with and applying advanced technology means constantly upgrading infrastructure as needs, services and applications change. To be competitive, a health care facility needs to get the most out of capital investments. Health care managers need power systems and equipment that deliver more capacity and last longer, but cost less to purchase, maintain and operate. Executive boards want to minimise capital expenditure and make their capital investments go further.

Eaton's comprehensive portfolio of highly efficient, scalable UPS solutions empowers health care facilities to make more effective use of their capital by deploying only as much UPS equipment as is needed initially, which also enables them to operate more efficiently (reducing operating expenses), and scale up their capacity when required.

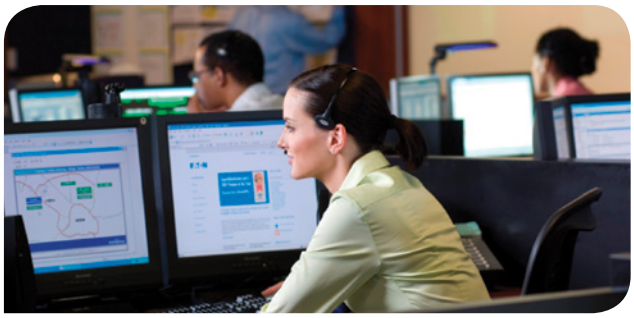
Aside from initially engineering and installing power protection equipment correctly to ensure compliance with standards, safely providing the desired performance, operational costs and continual reliability over the long term can only be achieved when systems are properly maintained.

Service agreements keep equipment functioning safely, reliably and at peak efficiency. Engineers and technicians monitor equipment performance after installation and perform maintenance when needed. Eaton offers performance-based maintenance services that provide the right maintenance at the right time to extend equipment life. That extends equipment life and reduces overall operating cost. Remote monitoring makes it possible to view what's going on in a power system. As new equipment and technologies are added, they are easily integrated into the remote-monitoring system, allowing managers to see and control the entire system. As a backup resource, Eaton technicians and engineers can monitor system performance remotely.

With Eaton's power quality solutions, equipment is more reliable, performs better and space is used more efficiently. Performance-based maintenance methods monitor performance and schedule maintenance only when performance slips. That's more efficient than the traditional practice of doing maintenance at fixed intervals, whether the equipment requires it or not. The result is extended equipment life and lower overall maintenance expense.

Eaton not only provides solutions to protect your equipment from power hazards and outages that can cause million-dollar losses, but also offers Power Distribution equipment, advanced Racks, Rack Power Distribution, Air Flow Management Systems and Integrated Security Solutions to keep your operations safe and secure.

Whether you operate a single hospital or a network of facilities, Eaton can provide the power protection products and services you need. Eaton offers a comprehensive portfolio of solutions that are designed and manufactured to work together to provide consistent, reliable power for your critical equipment.



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Not All Alcohol-Based Hand Rubs are Equal

Factors to Consider When Choosing Alcohol-Based Hand Rubs (ABHR) for Your Healthcare Facility *writes Elizabeth De Nardo, PhD and Christine Claighen, BSC, Biotechnology.*

Hand Hygiene is one of the most important actions Healthcare Workers (HCWs) can take to reduce the transmission of pathogens that may cause disease. However, hand hygiene compliance average rates have been around 40%, in healthcare settings throughout the world (WHO, 2009).

Many factors play a role on hand hygiene compliance rates but choosing the correct hand hygiene products and user acceptance are major determinants of improving hand hygiene compliance by HCWs (Larson, et al. 2006; WHO, 2009).

Selecting an appropriate antiseptic hand rub is an important decision to make because the clinical effectiveness of Alcohol Based Hand Rubs (ABHR) in reducing Healthcare Associated Infections (HAIs) is a result of several components including: product formulation, antimicrobial efficacy and hand hygiene compliance by the HCWs (Fig.1).

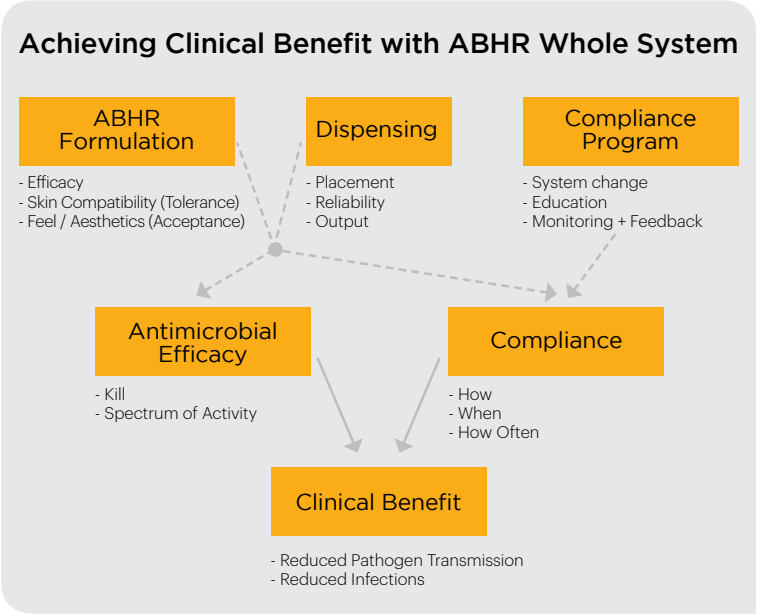

Figure 1 shows that the ability to achieve clinical benefit from ABHR is directly dependent on both the antimicrobial efficacy of the product and hand hygiene compliance. Efficacy and compliance are influenced by several components including: product formulation, dispensing system, and compliance programs.

Although costs of the product are always part of the selection process, a risk/benefits analysis should be conducted and the costs associated with treating preventable HAIs should be considered. A product with undesirable characteristics may discourage hand hygiene among staff, resulting in poor compliance with all of the costs that this incurs in terms of infectious complications (Larson et al., 2006).

Currently in the market we find several hand antiseptics containing different antimicrobial active ingredients, such as alcohol, quartenarium compounds, and others. However, alcohol is the active ingredient of choice for antiseptics hand rubs by leading health organizations such as World Health Organization (WHO); Center for Disease Control and Prevention (CDC) based upon an abundance of scientific evidences of its efficacy (WHO, 2009). Therefore, this article will focus solely on Alcohol Based Hand Rubs (ABHR) and describes main factors to consider when selecting for your health care facility. Those include: antimicrobial efficacy, product formulation, skin tolerance, and user acceptance.

1. Antimicrobial Efficacy of ABHR

The antimicrobial properties and efficacy of ABHR selection should be reviewed prior to engaging staff for end users acceptance and skin tolerance.

With the exception of non-medicated soaps, every new formulation for hand antisepsis must be tested by the manufacturer to demonstrate that it meets the agreed efficacy performance standard. The formulation with all its ingredients should be evaluated to ensure that humectants or rehydrating chemicals added to ensure better skin tolerance do not in any way compromise its antimicrobial action (WHO, 2009).

ABHR are widely accepted in the majority of countries falling under a variety of regulatory schemes, unique to each country or region in which they are marketed. In Australia if an ABHR only claims to be effective against bacteria then it is considered a cosmetic and is regulated under NICNAS. If the ABHR claims to be effective against bacteria and more such as fungi, viruses, yeast, etc, it is then considered a drug regulated by the Therapeutic Goods Administration (TGA) under the OTC (over the counter sector).

Regulatory Agencies in general require both in vitro and in vivo antimicrobial efficacy testing of the finished product. *In vitro* testing is used to demonstrate the speed of kill and the spectrum of activity of products. In vivo laboratory studies using human subjects are designed to mimic the hospital setting and serve as surrogates for clinical efficacy (WHO, 2009).

1.1. Protocols used for Testing the Antimicrobial Efficacy

Although many methodologies are available to perform the *in vitro* and *in vivo* tests the two most accepted protocols are the ASTM which refer to the standards of ASTM International (formerly, the American Society for Testing and Materials) mostly used in the U.S. and the European Committee for Standardization (CEN) adopted by most of the European countries. Australia TGA accepts protocols from both organizations (ASTM International, 2006, Comité Européen de Normalisation, 1997).

1.1.1. *In Vitro* Testing

In vitro tests are performed in laboratory, under a controlled environment and a battery of 25 or more pathogens of public health concern, mainly bacteria, are exposed to the formulation for 15 a 30 seconds. A minimum of 3 to 4 log reduction (99.9 to 99.99%) is expected. Results from the in vitro tests do not always predict the *in vivo* tests results (Edmonds et al., 2011).

1.1.2. *In Vivo* Testing

Currently two standard test methods: ASTM E1174 and EN1500 are accepted in most countries. The choice of which depends on the particular country in which the product is to be marketed. Australia TGA accepts both protocols. Both tests measure the reduction of a transient marker organism (*Serratia marcescens* for ASTM E1174 and Escherichia coli for EN1500) on the hands of adult subjects.

1.2. Formulation Matters not Alcohol Concentration

The antimicrobial activity of alcohols results from their ability to denature proteins. Alcohol solutions containing a range of 60–90% alcohol content is most effective and recommended by leading Health Care Organizations (Boyce et al, 2002, WHO, 2009).

However, formulations that contain more alcohol concentration do not mean they have better antimicrobial efficacy. Formulation as a whole is more important than alcohol concentration. →

→ Recent studies (Edmonds *et al.*, 2011 and 2012) comparing the in vivo efficacy of several ABHR containing different alcohol concentration showed that antimicrobial efficacy does not correlate with alcohol concentration (Fig. 2); more alcohol is not always better. In addition, those studies also show that product format (gel and foam) does not impact efficacy. Gel and foam have the same in vivo efficacy.

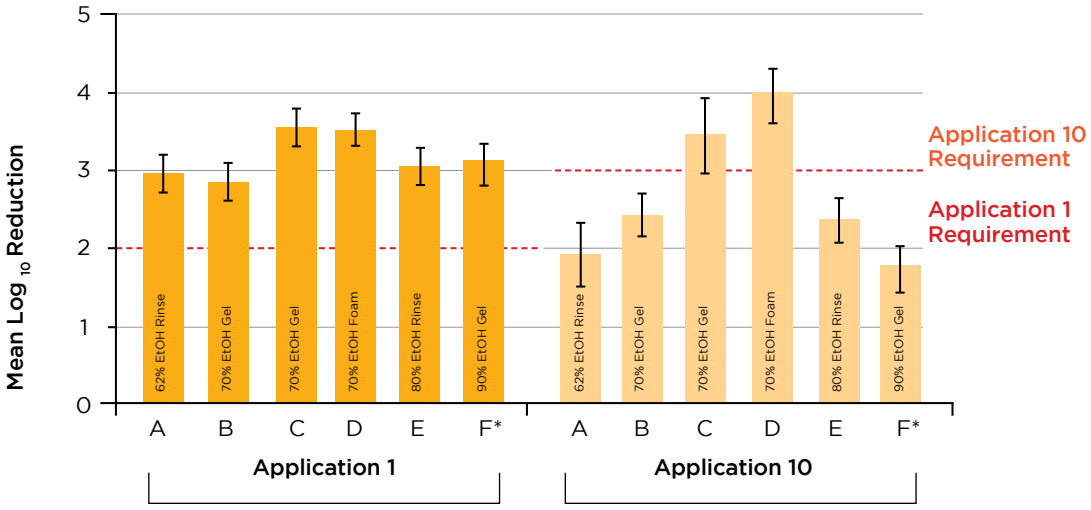

Figure 2. Bacteria log reduction (in vivo test- ASTM E1174) of several ABHR containing different alcohol concentrations (Edmonds, *et al.*, 2011)

Figure 2 illustrates the influence that product formulation can have on in vivo efficacy. Two 70% formulations (Products C and D) performed statistically superior at application 1 and 10 than another 70% formulation (Product B) indicating that alcohol concentration does not drive antimicrobial efficacy. Furthermore, some 70% formulations (Products C and D) perform significantly better than higher alcohol formulations (Products E and F). Some 70% formulations (Products C and D) perform significantly better than higher alcohol formulations. These data clearly demonstrate that product formulation is a key driver of product efficacy, regardless of alcohol concentration (Edmonds *et al.*, 2011 and 2012).

ABHR are complex formulations, combining alcohol with various ingredients to create specific attributes including skin tolerance, skin moisturisation, aesthetic properties (e.g. skin feel, fragrance, etc.); and to enable specific delivery formats to effectively deliver the active ingredient. These additional ingredients can in some cases improve or inhibit the formulation's antimicrobial efficacy (Edmonds et al., 2012). Therefore, not all ABHR are equal. Formulations matter for antimicrobial efficacy (Fig.3).

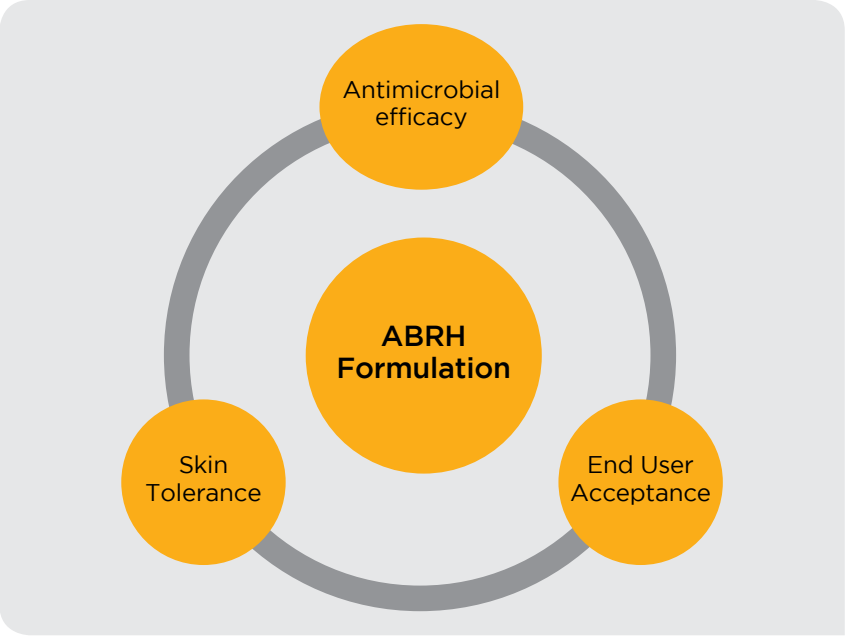

Figure 3 illustrates that formulation as a whole has impact on the antimicrobial efficacy, skin tolerance and end user acceptance.

As Figure 3 shows, the whole formulation (active plus inactive ingredients) has influence not only on the antimicrobial efficacy, but also on the skin tolerance and end user acceptance of the product. This knowledge should be taken into consideration during the selection process.

1.2.1 Suggested questions / data required from the product manufactures regarding antimicrobial efficacy:

1 Ask for *in vivo* results, they are the best to show the antimicrobial efficacy of the product. Don't be fooled by 99.999999"% of the in vitro results;

2 Ask for the type of protocol/ methodology used for testing the *in vivo* efficacy:
ASTM E1174 and EN1500 are the global standards protocols. Different protocols to assess efficacy can show different results;

3 If ASTM E1174 was used request data on the volume of the product used to meet the criteria. Some products require unreasonably large volumes to meet test requirements. However, large volumes of the product is not used typically in healthcare facilities and not desired by HCW because of the long time it takes to dry on hands (Macinga, et al., 2012).

Summary

- Recommendation of types of data to ask from product manufacturers has been proposed.
- ABHR are complex formulations, combining ethyl alcohol with various ingredients to create specific attributes including antimicrobial efficacy, skin tolerance and aesthetic properties (e.g. skin feel, fragrance, etc.) that contribute to the end user experience / acceptance of the product leading to improve or inhibit hand hygiene compliance in health care facilities.
- The process of selecting ABHR for your facility is such an important decision to make because the clinical effectiveness of those products in reducing Healthcare Associated Infections (HAIs) is a result of several components including: product formulation, antimicrobial efficacy and end user acceptance of the product the HCWs.
- There are still many false beliefs among HCWs about the effect of ABHR may have on the skin.
- Although costs of the product are always part of the selection process, a risk / benefits analyses should be conducted and the costs associated with treating preventable HAIs should be considered.

About the Authors

Elizabeth De Nardo is a Senior Scientist with GOJO Industries. Dr De Nardo holds a PhD in Biology/ Microbiology with a major in Virology. She has conducted extensive research in virology and is responsible for the technical information process at GOJO which results in her interfacing with numerous key customers as a technical liaison giving information about the science behind the formulations. She has more than 15 years of academia experience and 8 years of industry experience working in the Hand Hygiene arena. She has given many presentations at scientific conferences and has published several research articles in her field of expertise.

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Christine Claighen is the Regulatory and Scientific Manager, Australasia with BSC majoring in Biotechnology and Microbiology. Christine's role allows her to liaise face to face with Infection Controllers in the industry to assist with some clinical matters, discuss formulations and best solutions. Christine is recognized by the Stamford Who's who as a technical professional with 15 years of industry practice in Microbiology, Manufacturing, Quality and Regulatory Affairs in the pharmaceutical and Medical Devices industry.

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Why take a risk with blood stream infections?

3M™Tegaderm™ CHG (chlorhexidine gluconate) IV Securement Dressings Clinically Proven to Reduce Catheter-related Bloodstream Infections (CRBSIs)

Reducing the risks of infection in vascular access is vital to the safety of patients in Australia.

Catheter-related bloodstream infections (CRBSIs) are one of the most serious and costly healthcare associated infections (HAI), leading to increased costs through extended hospital stays, illness and death.

HAIs are the most common complication affecting patients in hospitals. Each year, around 200,000 HAIs are contracted by patients in Australia. At least half of HAIs are preventable. Successful infection control to minimise the risk of transmission requires a range of strategies across all levels of the healthcare system and a collaborative approach for successful implementation[1].

The Australian Commission on Safety and Quality in Health Care have developed ten National Safety and Quality Health Service Standards. Standard 3 - Preventing and Controlling Healthcare Associated Infections aims to prevent patients acquiring preventable HAIs and to effectively manage infections when they occur using evidence based strategies.

In brief, this Standard requires that:

- Effective governance and management systems for HAIs are implemented and maintained.
- Strategies for the prevention and control of HAIs are developed and implemented[1].

Tegaderm™ CHG Chlorhexidine Gluconate IV Securement dressings combine the most critical elements to protect IV site care into a single product to help you meet your goals for patient safety, clinician confidence and cost of care.

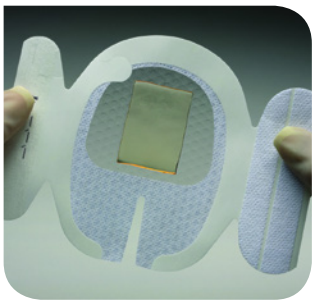
Tegaderm™ CHG dressings are the only transparent IV site dressings integrated with a 2% w/w chlorhexidine gluconate (CHG) gel pad, proven and indicated to reduce CRBSIs and catheter colonization[2].

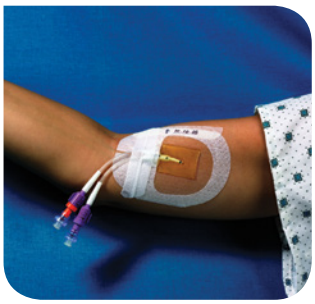
The microorganisms that colonise catheter hubs and the skin adjacent to the insertion site, such as coagulase-negative staphylocci and Staphyloccus aureus are the source of many catheter-related bloodstream infections. The integrated CHG gel pad in the Tegaderm™ CHG dressing provides immediate and continuous protection offering a consistent level of antimicrobial activity for over 7 days[3].

Using Tegaderm™ IV Film Dressings also supports Standard 3 - standard and surgical approach to aseptic technique practices (Aseptic Non Touch Technique) by simplifying dressing application and change practices with central venous and/or arterial catheters. The frame delivery system provides handles for application to the IV site reducing the risk of touch contamination of the skin side of the dressing as well as easy and accurate positioning of the dressing. The transparent window reduces the risks of touch contamination by providing a closed system that permits regular and visual inspection and monitoring of the IV site.

While recent industry, government and clinical initiatives have led to a significant reduction in the risks, costs and incidence of CRBSIs, even one CRBSI is one too many. Even if your infection rates are low, you can help to reduce CRBSIs by making Tegaderm™ CHG dressings a key component of your care bundles and infection prevention practices.

Tegaderm™ CHG dressings support the goals of professional standards, guidelines and facility protocols for improving patient outcomes.





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Site Visibility: Transparent film and gel pad allow continuous site observation.

Breathability: Promotes moisture evaporation and enhances securement.

This all-in-one dressing is designed to help you meet your goals for patient safety, clinician confidence and cost of care. To learn more, visit: **www.3M.com.au/healthcare**

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Eschmann is evolving

Eschmann has been designing, manufacturing and maintaining suction units for over 50 years and have developed a range of suction units designed for optimum performance, yet simple to use with minimal ongoing maintenance.

The Eschmann philosophy is one of working closely with the people who matter the most – the clinicians and professionals who use the products. This experience, together with these professional partnerships has resulted in the development of the new VPX35 and VPX45 suction units. The new VPX advanced portable suction range from Eschmann provides the perfect solution for today's hospital and operating theatre environments.

VPX35 and VPX45 high vacuum surgical suction units are capable of 35 and 45 litres of suction per minute respectively. Each model can accommodate up to four jars, are fully mobile for maximum flexibility with easy to clean, smooth, sealed surfaces and fitted with durable, antistatic castors and optional pneumatic footswitch variant.

VPX is the newest offering from Eschmann and a perfect complement to the high quality lithium ion portable battery powered VP Series units.

The VP Series offers VP18 and VP26, each model can accommodate up to three jars at a time and is capable of delivering a flow rate of 18 and 26 litres per minute respectively. Ideally suited to A&E departments, theatre recovery, nursing homes, ICU, Outpatients and other high risk areas the compact, robust and portable suction units are lightweight and easy to store.

Capable of running continuously at maximum suction for up to 45 minutes the battery powered units can be used and charged simultaneously when required. The adjustable clamp and wall mounted variants provide the added advantage of being fully charged and ready to use in an emergency.

EBOS Healthcare is the sole, exclusive distributor of Eschmann products in Australia and will add the new VPX suction range to compliment the VP portable battery powered range in May.

VP18

VPX45

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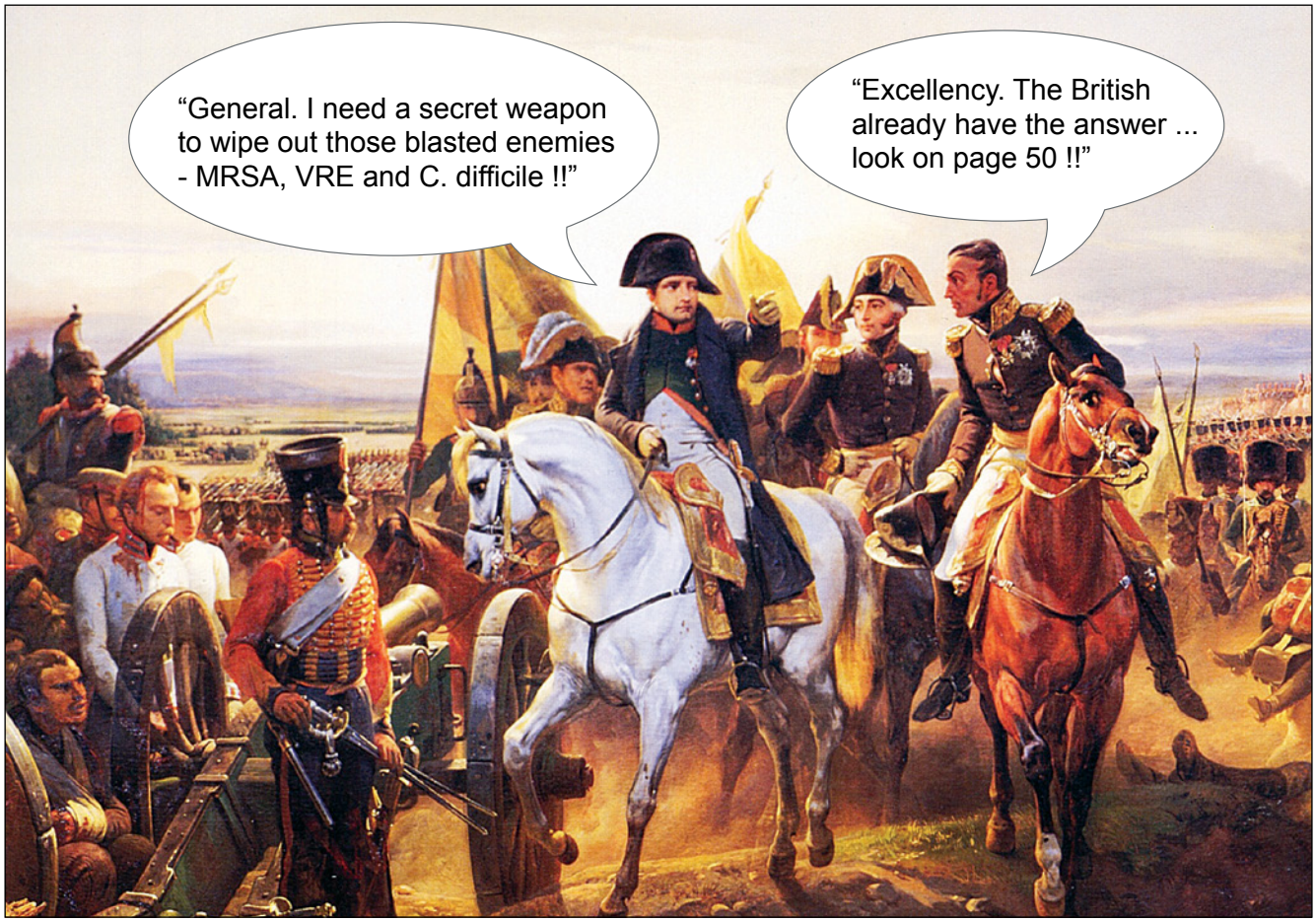

When safety matters, think TERUMO

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Kimberly-Clark Health Care is now Halyard Health

HALYARD Health is a global medical technology company focused on preventing infection, eliminating pain and speeding recovery. Formerly known as Kimberly-Clark Health Care, HALYARD became an independent company on 1 November 2014.

The new company, with its Australian head office at Milsons Point Sydney, reported 2013 net sales of $1.7 billion across its surgical and infection prevention (S&IP) products and medical device businesses. HALYARD has 16,500 employees and markets products in more than 100 countries worldwide.

"Today HALYARD Health launches with three decades of industry experience, leading positions in large markets, a diverse portfolio of strong brands and solid cash flow," said Robert Abernathy, chairman and CEO, HALYARD Health.

"We are confident about our prospects to deliver growth and value creation to our shareholders as an independent healthcare company focused on innovation."

"HALYARD'S solutions are designed to address some of today's most important healthcare needs, such as preventing infection and reducing the use of narcotics, while helping patients recover faster," said Abernathy. HALYARD will focus on maintaining its high standards of service and growth for its diverse range of infection protection products, medical devices and pain management.

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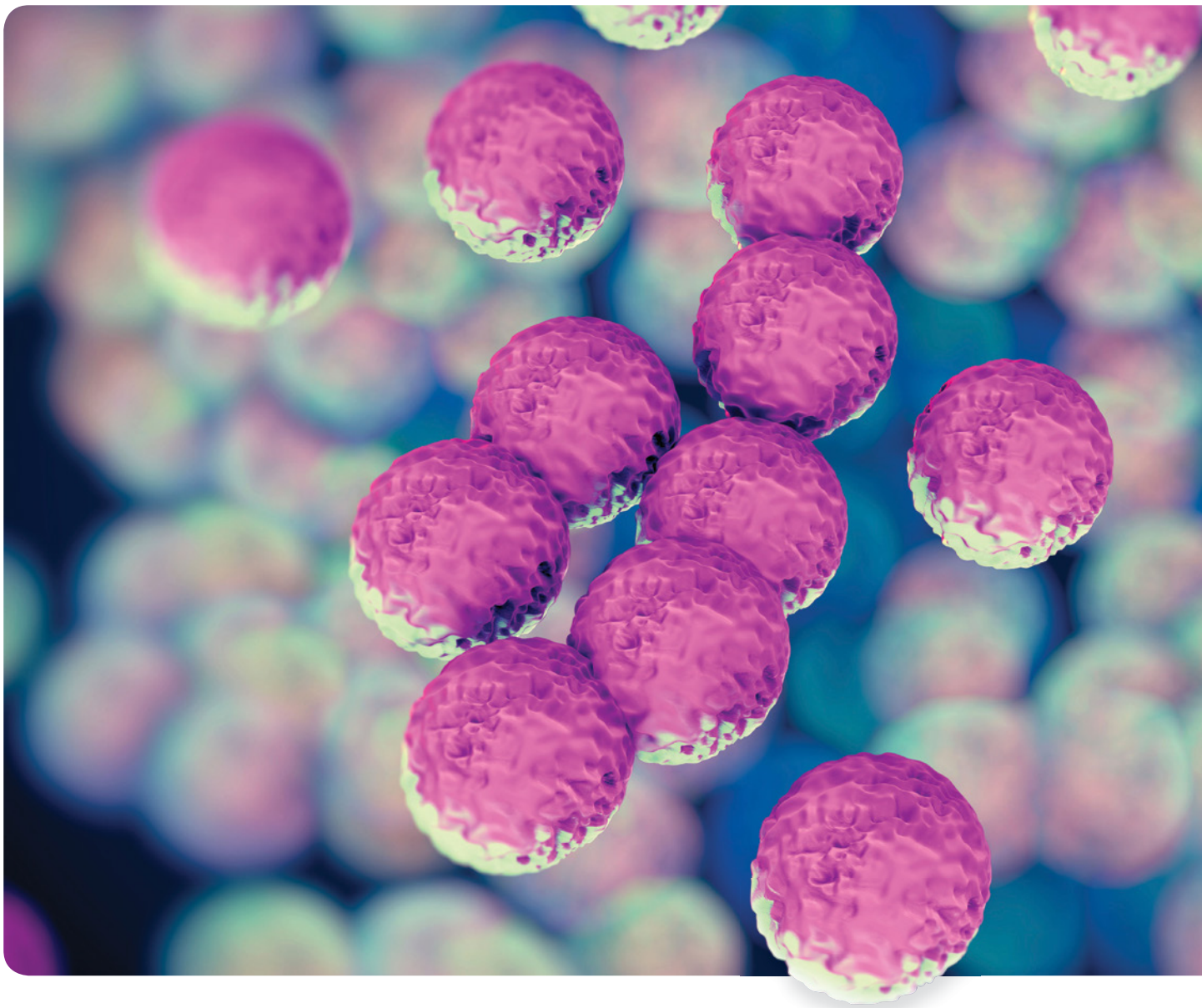
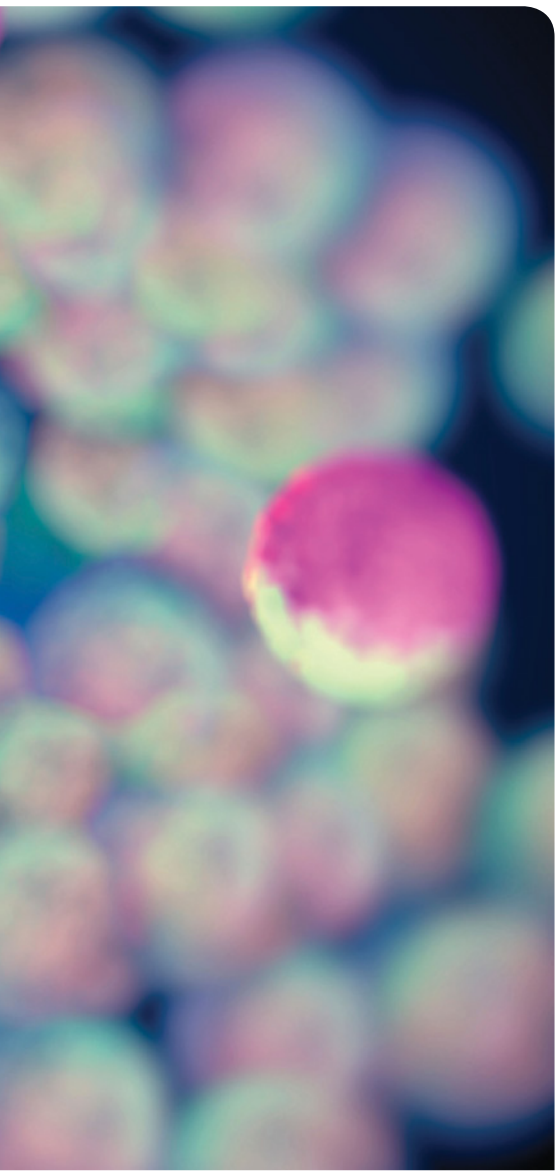


Controlling Infection through Correct Hand Hygiene

Hand hygiene at the right time saves lives [1]

Every year, hundreds of millions of people across the globe suffer from a healthcare associated infection.[2] Effective hand hygiene at the right times is considered to be the single most important – and low cost – strategy for preventing healthcare associated infections as it reduces the number of microorganisms on hands. [2, 3] Hand hygiene includes washing hands with water and soap or using an alcohol-based hand rub.[3]

Some of the barriers to good hand hygiene among healthcare workers include heavy workloads, a perception that it is time consuming, lack of understanding about the importance of hand hygiene, problems with skin irritation and poorly located sinks.[3]



Hand hygiene in Australia

Hand hygiene and reducing healthcare associated infections are key priorities for the Australian Commission on Safety and Quality in Health Care (the Commission). For several years the Commission, Hand Hygiene Australia, and each jurisdictional authority have collaborated to support the significant efforts of frontline infection control practitioners. As a result, hand hygiene compliance has improved markedly: in August 2009, data from 182 hospitals showed an average national hand hygiene compliance rate of 64% (nurses 69%, doctors 49%).[4] In October 2014, data from 828 hospitals showed the average national hand hygiene compliance rate had increased to 82% (nurses 86% doctors 71%).[4]

There's still room for improvement

The target for hand hygiene compliance in 2015 is an average of 95%. A range of resources are available for health service organisations to promote hand hygiene.

The World Health Organisation (WHO) has developed guidelines for healthcare workers to promote and improve hand hygiene programs in health service organisations across the globe. They are complemented by their hand hygiene implementation toolkit and improvement strategy.[2]

Hand Hygiene Australia's resources for healthcare workers have been adapted for use in Australia with a focus on helping them develop and sustain hand hygiene programs in a diverse range of health service organisations across the country.[5] These include a hand hygiene manual, practice guidelines for blood collection and dialysis, alcohol-based hand rub safety information, education (e.g. PowerPoint and video presentations), audit tools and guidelines, hand hygiene FAQs, promotional material (e.g. posters, brochures and fact sheets) and online learning packages.

For more information and to download resources for healthcare workers visit **www.hha.org.au/** or **www.who.int/gpsc/5may/en/**

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Antimicrobial Copper Builds A Healthy Market

A U.S. company, Olin Brass, is forging a whole new approach to infection control on its Antimicrobial Copper line called CuVerro

Late last year the company behind the CuVerro Antimicrobial Copper infection control line brought a whole new range of products to the huge, once a year Healthcare Design Conference in San Diego, California as part of the "Better Care Through Better Design" theme.

On top of new designs for IV poles, toggle light switches, door handles, cabinets and other hardware architecture they showed off some world and healthcare industry firsts, including an Antimicrobial Copper "wand" for controlling bedside and window curtains called "SafeGrip", a copper clad bug-fighting biro called "CopperPen", free weights, an automatic door switch, and keyboards and keypads.

Olin launched the CuVerro germ fighting copper brand a few years ago once the U.S. government's Environmental Protection Agency (EPA) allowed copper and a broad range of brass and bronze alloys to be called antimicrobial, the first ever material to be able to make such a public health claim.

Olin has since taken a unique, proactive approach to surface led infection control by creating a 'supplier-to-market' model that allows all sorts of affiliated companies to innovate, develop, manufacture and then market their products as part of the CuVerro family. It's an approach that's sparked a lot of creativity and a number of companies have also turned to other specialty firms or designers to help them create distinctive products, not only for healthcare, but a lot more broadly.

Pens, Pads, Wands & Weights

One of those is the "Century Copper" pen by A.T. Cross, a manufacturer and marketer of fine writing instruments since 1846, that's made from CuVerro's copper alloy bactericidal touch surface. While designed for doctors and other healthcare personnel, the pen's already found wider appeal following an announcement by office supplies retail giant, Staples, to carry them in its 1400 U.S. stores.

Another standout has been the involvement of "high end strength training equipment" company Black Iron Strength that's developed a fitness product line featuring CuVerro bactericidal copper gripping surfaces. It recently confirmed a deal with the Los Angeles Kings professional basketball team to supply copper boosted free weights and attachments for their newly renovated training centre.

"Our objective is to further minimize the exposure of bacteria in our training spaces and having dumbbells with CuVerro copper handles made huge sense in upgrading our equipment," Matt Price, LA Kings head strength and conditioning coach, said in a media release. "The net reduction of the spread of bacteria is our goal as we look to minimize athlete's time lost unnecessarily to illness."

Another company pushing the boundary between hospital and home is Operator Interface Technology (OIT), which has brought out a new range of electronic keyboards and keypads with the CuVerro touch surface technology. OIT, a leader in the development of rugged keyboards and keypads in kiosks, ATMs and other commercial areas, is hoping the new line will open doors in the healthcare industry.

And with good reason. A recent survey by the International Copper Association showed that nearly 20 percent of infection control experts ranked computer keyboards among one of the highest-risk surfaces for the spread of germs. The company has also added CuVerro surfaces to its entry door keypads that have found a ready market in hospitals and any other public access points where continuous bactericidal action is desirable.

"Of all the devices you'll find in today's clinical environment, the keyboard may be one of the hardest to clean effectively," an OIT spokesperson said. "Many claim to be 'washable,' but the reality is, these products deliver no proactive bactericidal action between cleanings."

Antimicrobial Copper Cu+

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You can see the full range of CuVerro products at **http://cuverro.com**

For a full outline on Antimicrobial Copper go to **www.antimicrbialcopper.com**

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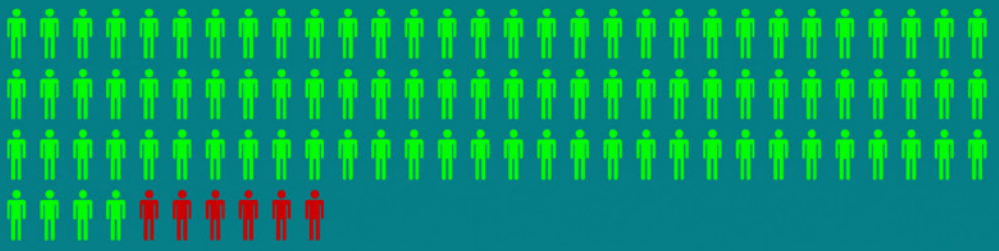
Fighting hospital infections with Antimicrobial Copper

Cu+

There are around 200,000 HAIs each year *2

7 out of 100

hospital patients will pick up at least one infection *1



24/7

Unlike sprays and hand washing, Antimicrobial Copper surfaces continuously kill 99% of HAI-causing bacteria *3

Antimicrobial Copper has been proven to cut infection spread by 58% in ICUs. *4

58%

With over 5M Australian ICU patients each year this means 240,000+ people could be infection free

Antimicrobial Installations in hospitals and medical centres are growing worldwide

Source:

1. WHO: The burden of health care-associated infection worldwide.
2. The Secret Life of Germs, P Tierno, Atria Books: New York, NY, USA 2001
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4. "SCCM - society of Critical Care Medieine." SCCM News RSS. n.d. Web. 02 April, 2013

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Where to find the source of all these facts:

www.antimicrobialcopper.com
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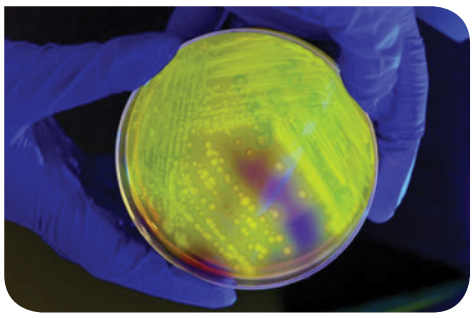
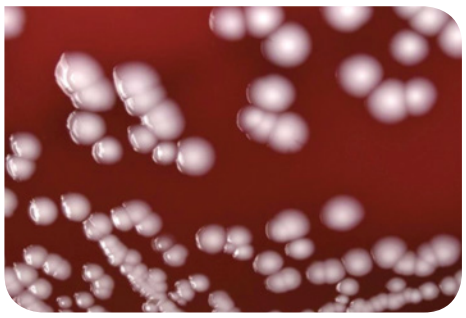


Clostridium difficile. Photograph Content Provider, CDC/ Melissa Dankel. CDC Public Health Image Library (PHIL). http://phil.cdc.gov/phil/home.asp



Acinetobacter baumannii. Photograph Content Provider, CDC/ Dr. Todd Parker. Ph.D.; Assoc. Director for Lab. Science/ DPEI(Acting) and LRN Training Coordinator. CDC Public Health Image Library (PHIL). http://phil.cdc.gov/phil/home.asp

Environmental Cleaning

There are approximately 200,000 healthcare-associated infections (HAIs) in Australian acute healthcare facilities each year 1. An estimated 20%-40% of healthcare associated infections are attributed to transmission via the hands of healthcare workers where contamination has occurred as a result of direct contact with patients or indirectly by contact with contaminated environmental surfaces.[2]

The recent literature has identified that environmental contamination plays a role in the transmission of healthcare-associated pathogens, including methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* spp. (VRE), *Acinetobacter spp*., norovirus, and *Clostridium difficile*. Hospital surfaces are frequently contaminated with healthcare-associated pathogens and a patient admitted to a room of a previously colonised or infected person has an increased risk of developing colonisation or infection with the same pathogen.[3]

These pathogens can remain viable on surfaces or items for days to weeks. Pathogens such as Influenza and rhinovirus can persist on surfaces for a few days, vancomycin resistant Enterococci (VRE) for 5 days – 4 months, *Staphylococcus aureus* including methicillin resistant *Staphylococcus aureus* (MRSA) for 2-9 weeks, *Acinetobacter* species for 3 days – 5 months, *Serratia marcescens* for 3 days – 2 months and *Pseudomonas aeruginosa* for 6 hours – 16 months and spores such as Clostridium *difficile* for to 5 months. [4]

Improved surface cleaning and disinfection can reduce transmission of these pathogens in healthcare settings and daily disinfection of high-touch surfaces in rooms of patients with *Clostridium difficile* infection and methicillin-resistant Staphylococcus *aureus* colonisation has been shown to reduced acquisition of these pathogens on hands of healthcare workers caring for the patients.[3,5]

Clostridium difficile spores are resistant to common hard surface disinfectants and management of these organisms in healthcare environments requires the use of a sporicidal chemical, such as sodium hypochlorite (more commonly known as bleach). In Australia commonly used low concentrations of regular bleach (i.e. 1000ppm available chlorine) require 15 to 25 minutes contact time to inactivate spores to a high level.6 Long contact times are generally not practical nor effective, in most healthcare settings.

On the other hand higher concentrations of regular bleach (i.e. 5,000ppm) which can inactivate spores to a high level in shorter contact times may result in corrosion, damage to rubber, plastic or metal surfaces and discoloration of colored surfaces such as furniture and countertops.

Gama Healthcare limited the manufacturer of Clinell wipes has been working to provide healthcare facilities with an innovative range of cleaning, disinfecting and sporicidal wipes.

The Clinell Sporicidal Wipe contains peracetic acid. When activated with water the powder sandwiched between the 2 layers will instantaneously produce hydrogen peroxide and this will interact with the Tetra Acetyl Ethylene Diamine (TAED) to produce peracetic acid. These wipes are recommended for specific circumstances in which there is an outbreak or suspected transmission of Clostridium *difficile* occurring in a healthcare setting. The peracetic acid in the wipes breaks down to safe and environmentally friendly residues (acetic acid, carbon dioxide and water) and can therefore be used in non-rinse applications.

The Clinell Universal Sanitising Wipe utilises a patented antimicrobial solution which contains 6 different biocides (agents that kill or inhibit the growth of microorganisms). These biocides are designed to work in synergy with one another, multiplying their effectiveness many times over, ensuring wide antimicrobial activity and a high kill count. The wipe is bactericidal and has activity against common multidrug resistant organisms (MDROs) including; *methicillin-resistant Staphylococcus aureus (MRSA), vancomycin -resistant enterococci (VRE)*. The universal wipe can be used on a daily/routine basis and on discharge of patients to clean and disinfect low risk patient equipment (i.e. beds, chairs, commodes) and environmental patient room surfaces.

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Clinell's patented cleaning system. Proven to be powerful and effective.

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Proven to be more effective in reducing spore counts than chlorine releasing agents[2].

Clinell Universal Wipes clean and disinfect surfaces in one easy step for everyday use. Hospital grade disinfectant wipes with wide spectrum bactericidal activity, including MRSA and VRE.

Alcohol free patented formula, with a mix of biocides with different mechanisms of action to mitigate against bacterial resistance.

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1. EPA ASTM E2362 / AOAC Method 961.02 (Modification) Pre-Saturated Towelettes for Hard Surface Sporicidal Activity – ATS Labs, November 2013. **2.** Doan et al. Clinical and cost effectiveness of eight disinfection methods for terminal disinfection of hospital isolation rooms contaminated with Clostridium difficile 027. J Hosp Infect. 2012 Aug 14.

clinell®

Cost-effective infection prevention

Rubbermaid Commercial Products introduces industry's first disposable microfibre

Described as an industry first, Rubbermaid Commercial Products (RCP) has introduced the Rubbermaid HYGEN Disposable Microfibre System for efficient cleaning and infection prevention in the healthcare environment.

The Rubbermaid HYGEN Disposable Microfibre System is designed and proven by third-party testing to remove 99.9 percent of microbes, which includes C. diff, a bacteria that can cause potentially life-threatening infections. The Rubbermaid HYGEN Disposable Microfibre System also features built-in scrubbers that enable complete dirt removal without smearing.

"With healthcare-associated infections resulting in the loss of thousands of lives and costing billions, microbe removal is crucial," said Matthew Francis, marketing manager for Rubbermaid Commercial Products. "What people don't realise is that even if microbes are killed by chemicals, they remain on surfaces and become food for live pathogens. We're excited to debut a solution that changes the cleaning game by removing these microbes to facilitate infection prevention and ensure patient safety without the use of chemicals."

The first product to deliver the cleaning power and efficacy of microfibre at a disposable price point, the Rubbermaid HYGEN Disposable Microfibre System enables cleaning staff to do more with less to improve productivity. The disposable microfibre mop can be used wet or dry and is compatible with Rubbermaid Pulse or Rubbermaid HYGEN Charging Bucket. Application areas include occupied and discharge patient rooms; emergency and isolation rooms; intensive care units; nurses' stations, X-ray stations and MRI stations; and other public areas.

Rubbermaid Commercial Products HYGEN

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For more information visit
www.rubbermaidcommercial.com.au

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of microorganisms, including c.diff*

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Electrolux Excellence now at Richard Jay

Richard Jay has been appointed as the national distributor for Electrolux Professional, the global expert in laundry and textile cleaning.

For over 45 years, Richard Jay has hand picked the world's leading brands and, in keeping with our goal to always offer the best quality machinery, we are proud to announce our latest partnership with a new international supplier- Electrolux Professional.

Electrolux Professional is a trusted global brand, proven across many segments including commercial and industrial laundry. Richard Jay will represent the Electrolux brand, alongside existing agents, distributing solutions nationally.

"With a strategy to make an impact on the Australian Commercial and Industrial laundry market, Richard Jay was the obvious choice for a new national supplier, considering their proven reputation in the industry" said Paolo Schira, Global Segments Director, Electrolux Professional. Richard Jay's national sales, service and spare parts call centre will provide greater service coverage for Electrolux Professional in the national marketplace.

Richard Jay has the broadest range of Commercial and Industrial laundry machinery in Australia as well as the country's largest stock holding in Brisbane, Sydney, Melbourne, Adelaide and Perth. This exciting partnership will expand this stock holding to include Electrolux Professional and enhance Richard Jay's position as a national industry leader in Commercial and Industrial laundry machinery.

Electrolux is a global leader in home appliances, based on deep consumer insight and developed in close collaboration with professional users. The company offers thoughtfully designed, innovative solutions for households and businesses.

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The S-Monovette® is the revolution in blood collection.

The S-Monovette® is an innovative enclosed blood collection system that allows the user to draw blood from the patient using the syringe or vacuum method, uniting the advantages of both techniques in a single product.

When used as a syringe, the phlebotomist has full control over the speed at which the blood is drawn into the tube. This is particularly useful for patients with fragile veins, such as the very young or elderly, where the use of the aspiration technique prevents even the most fragile veins from collapsing. When the tube has been filled, the plunger is simply snapped off to leave a primary sample tube which can be centrifuged and is compatible with all major analysers.

The S-Monovette® can also be used as an evacuated tube by drawing the plunger fully down and snapping it off immediately prior to blood collection. This creates a fresh vacuum and ensures a precise filling volume, ensuring a correct dilution ratio.

The reduced vacuum pressure in the S-Monovette® drastically reduces the rate of haemolysis and vein collapse, meaning increased sample quality and reduced costs associated with repeat collections. Furthermore, unlike pre-evacuated tubes, the S-Monovette® does not have to hold a vacuum for many months after manufacture, which allows the membrane stopper to be thinner and more easily penetrated by the needle sheath. This minimises the movement of the needle in the vein when attaching the tube, ensuring optimum patient comfort.

The S-Monovette® needle is ready to use so that there is no need for assembly to a holder. The needle is of a compact, low profile design, which reduces the chance of haematoma by allowing for a reduced angle of puncture and eliminates the possibility of needle stick injury caused by assembly of the needle and holder. The compact design also results in approximately one sixth of the sharps volume caused by using a pre-evacuated system, giving significant cost savings.

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Australian Research Transforming Wound Outcomes

Wound management poses a significant challenge to the healthcare system. In Australia alone it is estimated that more than 433,000 people suffer from chronic wounds such as leg ulcers, pressure injuries or non-healing surgical wounds at any one time and, yet, the true incidence is not really known as many people never seek help for their wound problems.

In Australia it is conservatively estimated that the problem of wounds costs the healthcare system more than $2.85 billion a year which equates to almost 2% of the Australian national healthcare budget. In addition, formal education and training for healthcare professionals is fragmented due to wound care not being recognised as a discrete healthcare field.

To address the growing challenge of wound care, the Wound Management Innovation CRC (WMI CRC) was formed in 2010 and brings together the best of industry, academia and end-user organisations. The Australian Government's CRC Program supports industry-led collaborations between key stakeholders to develop new technologies, products and services to ultimately transform the lives of Australians and the economy.

As the WMI CRC enters its translation phase, the key focus of operations for the remaining term is concentrated toward research, development, clinical translation and education activities that ultimately lead to the transformation of wound outcomes on a global scale.

Key areas of activity:

Research

The WMI CRC Research Portfolio is divided into three multi-disciplinary research programs that focus on the identification and development of new diagnostics, prognostics, therapeutics, wound management products, through to delivery of best practice wound care, translating evidence-based care into practice. The WMI CRC has a twice yearly research project intake that addresses specific wound aetiologies, as defined by the CRC's independently recommended research priority areas.

To date the WMI CRC has delivered some incredible outcomes that have already had a positive effect on wound healing in Australia. Key outputs to date include the discovery that using a twice-daily moisturising regime halves the number of skin tears, the most common wound in older Australians. The moisturiser study results have already led to the inclusion of twice-daily moisturising as standard protocol in 14 aged care facilities and the results have been presented at conferences nationally and internationally and publications are in preparation.

Another significant outcome includes an economic modelling study that has shown the conservative cost of chronic wounds to the Australian health system is an estimated $2.85 billion annually. This outcome has resulted in the need to include health economics as a core part of the CRC's activities. The CRC now has an independent health economist who will quantify specific research projects as well as modelling the economic benefits of optimal wound care across Australia. These recommendations will then be used to push for policy reform and adequate reimbursement for wound care.

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Branding & Communication Coordinator
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Shelley Morris has been with the Wound Management Innovation Cooperative Research Centre (WMI CRC) National Office since 2012 and currently manages the corporate branding and communications. Shelley's background and qualifications are in the areas of business administration, human resources, marketing, graphic design and brand management

Development

The WMI CRC has created an environment for development of our research into commercially valuable products. Royal Melbourne Institute of Technology (RMIT) University joined the WMI CRC in 2014 and their involvement in the CRC is based around licensing and developing technology to create next generation devices including pressure sensing materials for socks, shoes and insoles. There is a short, well-defined path to market for these technologies, which have the capacity to transform the lives of patients living with diabetic foot ulcers and venous leg ulcers and to deliver significant commercial return to the Australian community. The prospect of delivering these commercial products has also been increased by more active engagement with Industry.

Clinical Translation

A key area of activity for the WMI CRC is the dissemination of evidence-based best practice clinical resources to healthcare providers. The implementation of evidence-based best practice has been initiated in GP clinics and Residential Aged Care with the establishment of Cooperative Wound Clinic pilot project. Under this project wound consultants have provided hands on training and education resulting in improved knowledge and confidence in the treatment of wounds and improved patient outcomes. The CRC is expanding this concept towards self-sustainable business models that provide services beyond the CRC's term, including providing telehealth and education services into aged care through a Mobile Wound Service Project and exploring options to create a sustainable wound clinic network model.

Education

Despite the fact that evidence-based wound care often costs less to the healthcare system than standard community care, healthcare practitioners lack confidence and knowledge in the correct management of wounds due to a lack of education and training. The CRC has an Education Project that advises on skill and knowledge gaps and opportunities to continue in assisting the expansion of other CRC clinical translation activities. As at June 2014 the CRC has one of the most successful student programs, including a high volume of Higher Degree Research students, graduates, chapters, papers and presentations that have been acknowledged internationally.

Key Collaborations:

Australian collaborations

Core to the CRC Program is the unique collaboration between Australian academia, industry and end-user organisations to drive research to output. The WMI CRC has successfully brought together a growing total of 21 participants comprising the nation's leading laboratory based scientists, clinical researchers, wound practitioners, wound care organisations and corporate industry organisations.

The WMI CRC recently signed a collaboration agreement with the Cell Therapy Manufacturing CRC (CTM CRC). CTM CRC, through intervention with smart materials, is committed to the cost-effective manufacture and rapid translation of cell therapies for a range of clinical conditions. WMI CRC and CTM CRC will work together to access wound clinics and skilled practitioners to deliver these novel cell therapy based treatments, once prototypes are at a more mature stage.

International Collaborators:

The WMI CRC has over 20 international expert collaborators spanning 11 countries, and currently has two international collaborations in place with Wales and Canada. These Commonwealth collaborations will initially focus on the following important initiatives: the creation of "Diabetic Foot Australia" and wound social communities based on the Canadian model; an international post-graduate student exchange program; and launching an Australian Wound Registry based on the Welsh Wound Registry.

The introduction of clinical registries to monitor healthcare performance and track clinical effectiveness and cost-effectiveness of treatments in real-world clinical practice is one strategy proven to have demonstrable impact on improving service delivery. Clinical registries improve outcomes by engaging clinicians using credible data and fostering competition and they also help to encourage engagement among patients, families and/or caregivers and the community. The pilot phase of the wound registry project is approaching completion. This project assessed a hybrid pen-and-paper digital system to capture wound data as well as developing relationships and technical capability to integrate existing data into the Australian Wound Registry. The final report outlining the technical, legal and governance requirements is nearing completion with the intention to move to a roll-out phase in coming months to initiate upload of data into the registry.

The Future of Wound Care

WMI CRC will continue to explore additional industry partners and commercialisation opportunities to build on an already successful research and development portfolio. The CRC is unifying education and training resources to roll out best practice wound management education and training along with the progression of a number of promising and exciting spin out ventures from the CRC's assets and outcomes. The WMI CRC is in a strong position to deliver impact and value to ultimately transform wound outcomes locally and globally within its remaining term.

Preventing and managing pressure injuries

Pressure injuries are changes in the skin seen in people who are generally immobile (e.g. after CVA or spinal injury) or are unable to mobilise themselves in a normal manner (e.g. following surgery). Usually, when someone is sitting or lying in the same position for too long, pressure is relieved by changing position, or perhaps even getting up and going for walk. This takes away the discomfort, and also ensures that the blood supply to that part of the skin is returned to normal.

Where the skin passes over a bony prominence (e.g. the heels, elbows and hips) it is often quite thin, and this means that any skin trapped between the bone and the support surface will be more likely to be damaged faster than normal skin. The skin is also naturally thinner in the older person. When an older person becomes ill their food intake decreases and they also become much less mobile.

Add to this the possibility that they may become incontinent, and all the factors are present which, if left untreated, may lead to the development of a pressure injury (see Pressure Injury Identification Guide). Such wounds can result in considerable patient distress, as they can be very painful, and in severe cases may lead to infection, and even septicaemia and death. It should be stressed, however, that pressure injuries are not confined to the elderly, and that anyone who is immobile for any length of time is susceptible to pressure injury.

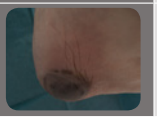
According to the most recent guidelines, the prevalence of pressure injury in Australia ranges from 5.6% to 48.4% in acute and sub-acute healthcare facilities, while in Australian long term care facilities it was estimated in 2004 to be 26%. The most recent prevalence rates in New Zealand were 29% in an acute care facility, and 38.5% in an intensive care unit of a major teaching hospital.[1]

So how should clinicians approach this problem? Firstly, by ensuring there is a procedure in place to identify those patients who are at risk of developing pressure injuries. There are many published pressure injury risk assessment scales available (e.g. Braden[2]) which are simple to use and can be easily implemented in most units. All patients, without exception, should be assessed on admission, and every time their condition changes.

Secondly, every facility should have in place a management protocol designed to prevent the development of the injury. This will have a number of components including: provision of pressure relieving support surfaces, which may include using dermal gel pads placed under the heels and/or sacrum (e.g.

Pressure injury identification guide[1#]

smith&nephew

Stage	Description	Suggested product selection primary	Suggested product selection secondary
Stage I 	Intact skin with non-blanchable redness of a localised area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area.	SECURA® Preventive Skin Care range DERMAPAD® * ALLEVYN® Life OPSITE® Flexifix Gentle	SECURA® No-Sting Barrier Film REMOVE® OPSITE® Flexifix
Stage II 	Partial thickness loss of dermis presenting as a shallow open wound with a red/pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.	OPSITE® FLEXIGRID® ALLEVYN® Life ALLEVYN® Range** ALLEVYN® Ag PICO®	SECURA® Preventive Skin Care range for surrounding skin SECURA® No-Sting Barrier Film REMOVE®
Stage III 	Full thickness skin loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling.	IODOSORB® ACTICOAT® Flex DURAFIBER® RENASYS® GO	ALLEVYN® Life ALLEVYN® range** SECURA® No-Sting Barrier Film REMOVE®
Stage IV 	Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present. Often include undermining and tunneling.	IODOSORB® ACTICOAT® Flex DURAFIBER® RENASYS® GO	ALLEVYN® Life ALLEVYN® range** SECURA® No-Sting Barrier Film REMOVE®
Unstageable pressure injury: Depth unknown 	Full thickness tissue loss, base of pressure injury covered in slough and/or eschar. Until slough and/or eschar is removed to expose the base of the wound, the true depth and therefore stage cannot be determined.	Consult wound care specialist for advice on appropriate management. INTRASITE® SOLOSITE®	ALLEVYN® Life ALLEVYN® range** SECURA® No-Sting Barrier Film REMOVE®
Suspected deep tissue injury: Depth unknown 	Purple or maroon localised area of discoloured intact skin or blood filled blister due to damage of underlying soft tissue from pressure and/or shear.	Consult wound care specialist for advice on appropriate management.	

DERMAPAD® and ALLEVYN® variants used for pressure redistribution should be used in accordance with local pressure injury protocols.

#For further information, please contact the wound care nurse in your facility.

* Secure DERMAPAD® with TENSOGRIP®, HANDY® CREPE or OPSITE® Flexifix Gentle.
** Secure non-adherent variants with OPSITE® Flexifix Gentle, SURGIFIX®, EASIFIX® Cohesive or HANDY® CREPE.

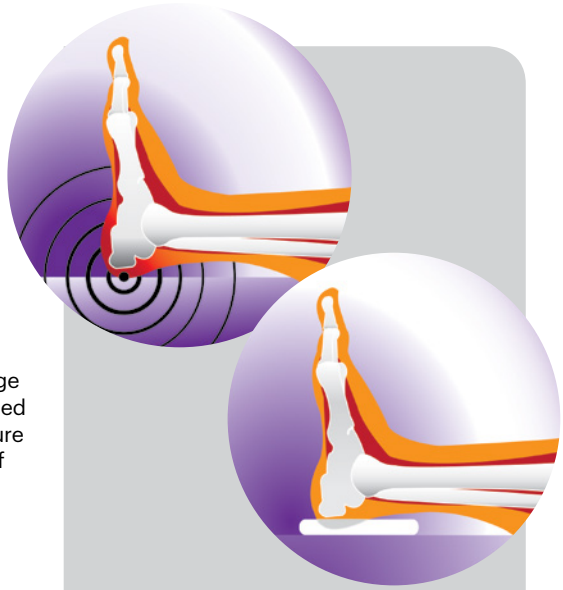
Reference: 1. National Pressure Ulcer Advisory Panel (NPUAP) and European Pressure Ulcer Advisory Panel (EPUAP), Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. 2009, Washington DC: NPUAP.

DERMAPAD◊)[3]; adequate nutritional support; ensuing that skin remains supple through washing with pH neutral products and adequate moisturising; prevention of damage from incontinence with use of barrier creams (e.g. the SECURA◊ skin care range) and perhaps catheterisation; mobilisation wherever possible; and frequent repositioning. Guidance on all of these interventions can be found in the Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury.[1]

Sometimes, despite all the best efforts a pressure injury still occurs. When this happens, ensuring the best possible wound care is the priority. This will include adequate debridement and the provision of a dressing that promotes moist wound healing, in addition to the removal of all pressure.

It is also worth remembering that although a high pressure will result in damage over a relatively short period of time, low pressure is equally damaging if applied over a long time. Because of this it is important to remember that good pressure injury prevention does not include sitting in a chair all day: in fact this is one of the most common causes of injury.

This article is sponsored by Smith & Nephew Pty Ltd.



DERMAPAD◊ – How it works.

High pressure points can disrupt the flow of blood and the supply of oxygen which can cause damage to the skin. DERMAPAD works by helping to redistribute pressure over a larger area to reduce the peak pressure at any one point by up to 89% (in-vitro)[4]

References:

1. Australian Wound Management Association. *Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury.* Osborne Park: Cambridge Media; 2012.
2. Bergstrom, N. et al. The Braden Scale for predicting pressure sore risk. *Nursing Research* 1987; 36: 205-210.
3. Woods S. Aderma+ dermal pads in the prevention of pressure ulcers. *Wounds UK* 2012; 8(4): 148-151.
4. Grayson N. ADERMA Pressure Mapping Assessment (9in-vitro). Data on file; 2012: report CCA2109/R2b.

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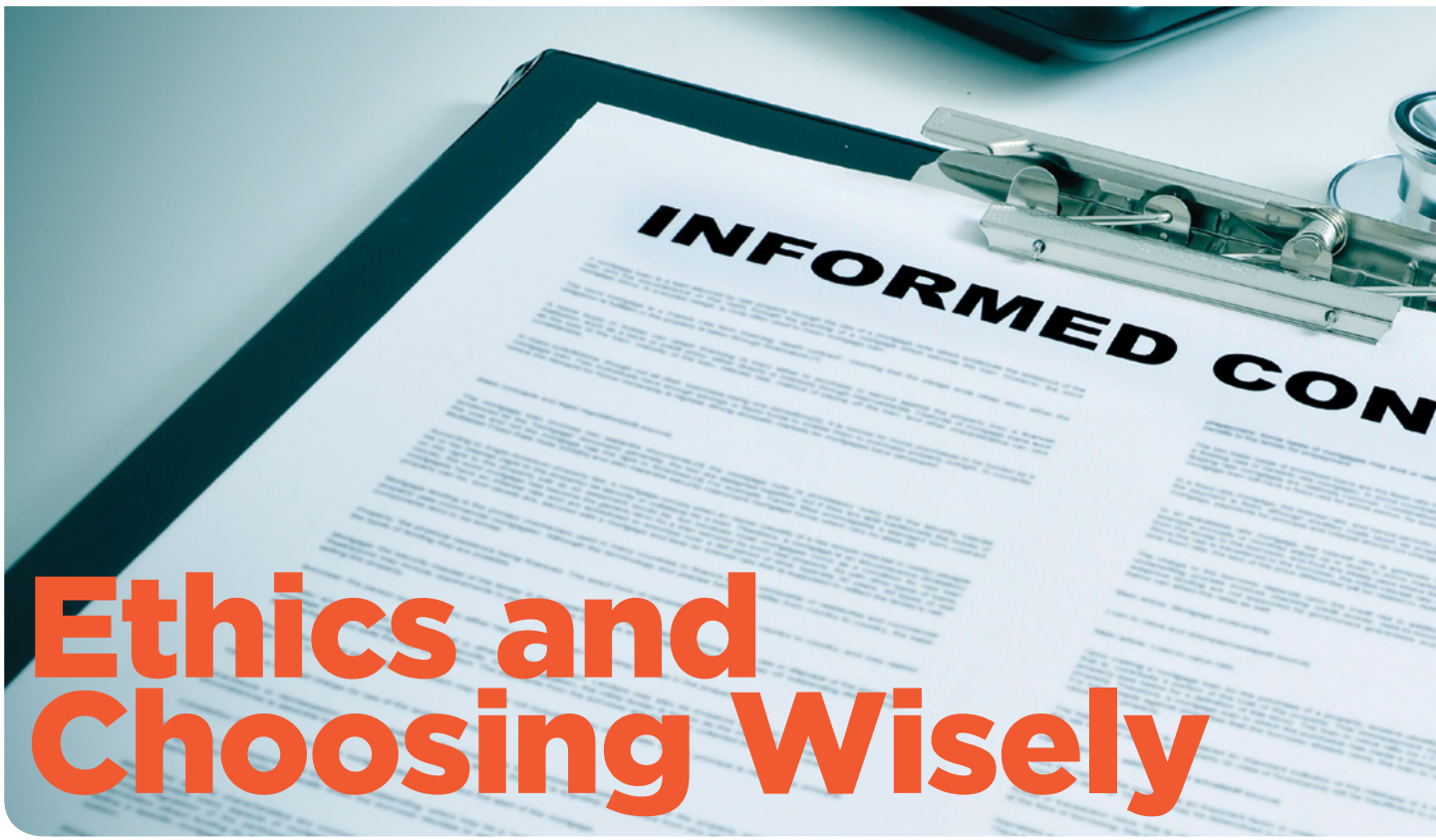

Ethics and Choosing Wisely

The primary ethical obligation of doctors and health professionals to their patients is to give primacy to the best interests of those patients. In "Good Medical Practice", the code of ethics adopted by the Medical Board of Australia, this is expressed in the following paragraphs:

> Doctors have a duty to make the care of patients their first concern and to practise medicine safely and effectively.
> *and*
> In clinical practice, the care of your patient is your primary concern.

This clear priority for an individual patient's welfare has long been an ethical touchstone of ethical professional health practice.

For this reason, other ethical responsibilities of health professionals have been less prominent. The principles of medical ethics have been identified as beneficence, non-maleficence, respect and justice. The first three can readily be related to the exercise of the primary responsibility for patients' welfare. The principle of beneficence is fulfilled by ensuring care that improves or restores a patient's health, the principle of non-maleficence is fulfilled by avoiding patient harm and the principle of respect is fulfilled by accepting a patient's autonomy to make choices about treatment that is offered.

However, the principle of justice has a wider reference. To some degree, this is expressed in "Good Medical Practice" in the following passages:

> Doctors have a responsibility to protect and promote the health of individuals and the community.
> *and*
> Good medical practice involves:
> **5.2.1** Ensuring that the services you provide are necessary and likely to benefit the patient.
> **5.2.2** Upholding the patient's right to gain access to the necessary level of healthcare and, whenever possible, helping them to do so.
> **5.2.3** Supporting the transparent and equitable allocation of healthcare resources.
> **5.2.4** Understanding that your use of resources can affect the access other patients have to healthcare resources.

Central to the concept of justice in relation to resources is that an allocation should be fair. However it can be difficult to determine what are the correct criteria for a fair allocation.

They can be any one of:

- To each person an equal share
- To each person according to need
- To each person according to effort
- To each person according to contribution
- To each person according to merit
- To each person according to free-market exchanges

The tension between the primary responsibility to individual patients and the responsibility to manage healthcare resources in accord with any of these criteria will be apparent. The tension has frequently been resolved in favour of the duty to the individual patient. In a substantially publicly funded healthcare system such as in Australia, a likely assumption is that determinations about the allocation of resources are made at institutional, regional, state or federal levels and not by individual health practitioners. Although it has been difficult to formulate clear guidance on how individual health professionals can fulfil a responsibility for the fair allocation of health resources, it is increasingly clear that individual decisions can significantly affect planned resource allocations.

Choosing Wisely as a program seeks to address this tension.

It does so by focusing on the link between the professional obligation to maintain and act on current knowledge on the one hand and choosing treatments and tests of proven efficacy that benefit patients on the other. The fact that a test or treatment has been conventional practice and is what patients expect or assume is standard practice needs now to be balanced against the evidence that supports or does not support the efficacy of those tests and treatments.

Patients have a well-established ethical and legal right to refuse proffered treatment, even in the knowledge that in the absence of that treatment they will suffer avoidable harm or even death. This ethical and legal right is an expression of the underlying ethical principle of respect for patient autonomy.

However, the right does not extend to requiring treatments to be offered by health professionals. It is the professional's duty to exercise skill and judgement in the context of a patient's condition to offer those treatments or tests.

The Choosing Wisely program is based on fundamental and well-established ethical principles of professional responsibility for individual patient care but, in the exercise of that responsibility, brings into sharp relief the additional duty to be satisfied that recommended or offered tests and treatments are appropriate. What Choosing Wisely promotes is the importance of seeking an objective basis upon which to make the judgement of appropriateness: a basis of evidence of clinical efficacy.

Colin Thomson
BA, LLB, LLM (Sydney)
www.ehealthinfo.gov.au

Colin Thomson, BA, LLM (Sydney) is Professor of Law at the University of Wollongong and Academic Leader for Health Law and Ethics in the Graduate School of Medicine. He also works as a consultant.

He was a member of the Medical Research Ethics Committee (1988-91) of the National Health and Medical Research Council and, from 1998-2002 a member, and from 2006-2009, chair of the Australian Health Ethics Committee. As a consultant, he has advised NHMRC, FaHCSIA, Health Departments of NSW, Qld and Vic and several universities. He is a Senior Consultant with Australasian Human Research Ethics Consultancy Services (www.ahrecs.com).

Colin has provided training to human research ethics committees, chairs the CSIRO Social Science HREC and is a member of HRECs at Department of Health and Ageing and University of Wollongong/Illawarra Shoalhaven LHD.

He is a joint author of *Good Medical Practice: professionalism, ethics and law,* 2010, Cambridge University Press.

"This clear priority for an individual patient's welfare has long been an ethical touchstone of ethical professional health practice."

OT and the first patient in surgery in the inflatable hospital in Arughat.

Team setting up the inflatable hospital in Arughat.

Médecins Sans Frontières Delivers Urgent Medical Care to Nepal with Inflatable Hospital

Nepal has been hit by two earthquakes in less than four weeks, killing thousands, injuring tens of thousands, and leaving millions more with the burden of rebuilding their lives. As part of the Médecins Sans Frontières (Doctors Without Borders) Emergency Response team, I was deployed within 24 hours of the first 7.8 magnitude earthquake. Our teams soon began medical activities and distributing shelter and food by helicopter to people in isolated villages.

As Emergency Coordinator I am responsible for coordinating our response on the ground, including managing the delivery and set up of the inflatable hospital. The Médecins Sans Frontières inflatable hospital is a temporary structure designed specifically to allow emergency teams to respond quickly to natural disasters, enabling them to provide people with quality healthcare while damaged health facilities are being reconstructed or repaired.

It is essentially an alternative in the context of natural disaster or armed conflict, when existing facilities are no longer functional. We can react rapidly to care for a large number of injured people under proper hygienic conditions when there are few other options for affected communities.

Getting the hospital to the site and installing it is a major logistical challenge. The first step was actually getting it into Nepal. The hospital itself and supplies of drugs were first despatched from Médecins Sans Frontières' supply depot in Bordeaux, France on 28 April 2015. Once we received everything on the ground in Kathmandu we then had to decide where it would go. It was decided the hospital was to be set up in the village of Arughat, Gorkha district. Arughat doesn't have a secondary hospital and only had one dispensary which was destroyed in the first earthquake on April 25th. On the advice of the Ministry of Health, the inflatable hospital was set up here to serve as a secondary hospital with a fully-equipped operating theatre.

One of the critical considerations was the fact that this is the only hospital with surgical capacity for the population of Arughat and surrounding villages. Most of the health facilities in Gorkha district had collapsed and the Arughat hospital is helping provide the much-needed secondary healthcare in the area. There are people who tell us they have walked for five days to the hospital, which goes to show just how severely the earthquakes have destroyed the healthcare system.

Once the location was decided the teams then began to receive everything. So we started with the tools to prepare the ground and then set up the tents. After the tents, electricity and sanitation are set up. The rest is a"plug and play" procedure with medical equipment installed. This includes an X-ray machine, ultrasound and oxygen concentrators.

Eric Pujot
Emergency Coordinator, Nepal
Médecins Sans Frontières
(Doctors Without Borders)

Eric Pujot is the Program Manager for Médecins Sans Frontières' projects in Papua New Guinea, Cambodia, Nepal and the Philippines. He has recently returned from Nepal where he was working as the Emergency Coordinator following the first earthquake. Eric has previously worked in a variety of field positions around the world with Médecins Sans Frontières, including Head of Mission in Sierra Leone.

"There are people who tell us they have walked for five days to the hospital, which goes to show just how severely the earthquakes have destroyed the healthcare system."

A patient being treated in the inflatable hospital in Arughat.

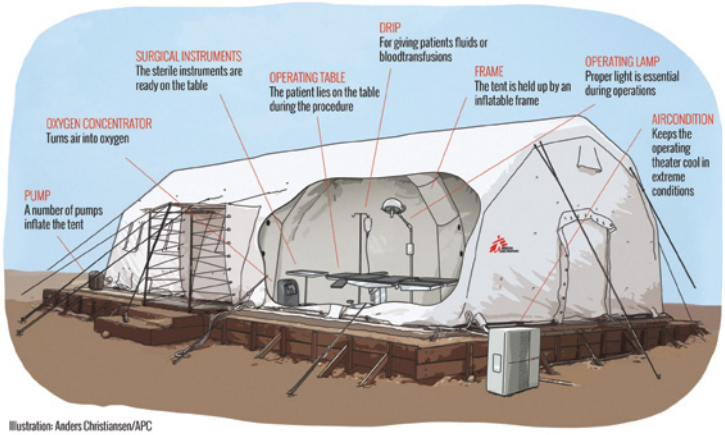

Illustration: Anders Christiansen/APC

The set up took longer than usual for us due to tough terrain and other logistical challenges. Arughat is a seven hour drive from Kathmandu and the field hospital, including the generator and air-conditioning unit had to be carried in three different trucks. However, once all the components reached Arughat, the setup was completed in 24 hours.

We have a dedicated team that worked on the set up of the hospital. They are on very short assignments at the beginning of the operation as they are working day and night to get the setup complete.

The hospital has been operational since May 8 and consists of an in-patient department with 20 beds, an emergency room, an operating theatre, laundry, sterilisation room and a room for pharmaceutical stock.

Our teams now see patients affected by the two earthquakes as well as people from nearby communities. It has surgical capacity, maternity, emergency and general wards, and a mental health program.

We are also additionally working with the Ministry of Health to offer outpatient services. Médecins Sans Frontières is also supporting drug supply, medical training and the referral system for the hospital.

An average of 100 patients are treated per day in the outpatient department, mainly suffering from respiratory tract infections, diarrhoea, and wounds sustained from the earthquake. In the emergency room, Médecins Sans Frontières is treating an average of 15 patients per day mainly suffering from fractures and wounds. In maternity, we have had three deliveries, including one complication of retained placenta.

There are around 30 Médecins Sans Frontières staff working in the hospital, both international and national. This includes midwives, nurses, doctors, a pharmacist, a surgeon, one anaesthetist and an operating theatre nurse, as well as staff for sterilisation, laundry and cleaning.

The inflatable hospital is not set up with an end date in mind and can function for as long as required. Essentially there is no time limit. However, we know it is a temporary solution so usually we try not to use them for too long. They can also be easily re-used for other medical services with just a few alterations.

It's been ten years since we first used the inflatable hospital in Pakistan. At that time we were still figuring out all the logistics - from the water, sanitation and electricity to the erection of the tent. And now ten years on we have learnt a lot from our experiences and now able to implement the hospital much faster and anticipate obstacles in advance. While we are always looking for new and innovative ways to respond to natural disasters, the inflatable tent is something we will continue to use for a long time to come.

About Médecins Sans Frontières

Médecins Sans Frontières is an international, independent medical humanitarian organisation that was founded in France in 1971. The organisation delivers emergency medical aid to people affected by armed conflict, epidemics, exclusion from healthcare and natural disasters. Assistance is provided based on need irrespective of race, religion, gender or political affiliation. When Médecins Sans Frontières witnesses serious acts of violence, neglected crises, or obstructions to its activities, it will not be silenced.

Today Médecins Sans Frontières is a worldwide movement with 23 offices, including one in Australia. Médecins Sans Frontières field staff include doctors, nurses, administrators, epidemiologists, laboratory technicians, mental health professionals, logistics and water and sanitation experts. Each year around 2,500 international personnel contribute to a global team of close to 30,000 Médecins Sans Frontières field staff providing emergency medical care in more than 60 countries. In 2014, 191 field positions were held by Australians and New Zealanders.

Australian and New Zealander field staff are currently on assignment in Afghanistan, Armenia, Central African Republic, Democratic Republic of Congo, Egypt, Ethiopia, Greece, Haiti, India, Iraq, Kenya, Lebanon, Liberia, Malawi, Malta, Myanmar, Nepal, Nigeria, Pakistan, Palestinian Occupied Territories, Papua New Guinea, Philippines, Russian Federation, Sierra Leone, Sudan, South Sudan, Syria, Uganda, Ukraine and Uzbekistan.

The inflatable hospital was first used by Médecins Sans Frontières in November of 2005, following the earthquake that devastated Pakistani Kashmir. During the days that followed the earthquake, thousands of injured victims streamed out of the affected region toward Mansehra, where the district hospital was severely damaged. Médecins Sans Frontières opened a temporary hospital in Mansehra measuring over 1000 m^2, and with a 120-bed capacity, built under nine inflatable tents. This structure, which included four operating suites, an emergency room and an intensive care unit, was erected in two weeks. This was the first time that Médecins Sans Frontières was able to establish a substantial surgical presence following an earthquake. Around 700 injured people received care in this temporary hospital in Pakistan. We have since used these tents in Indonesia and in Southern Sudan in 2006, in Yemen and the Democratic Republic of Congo in 2008, Gaza and Sri Lanka in 2009 and the Philippines in 2013.

Behavioural Health Furniture by Herman Miller Healthcare

Informed by research with leading facilities, Herman Miller Heathcare has a family of thoughtful solutions that provide quality craftsmanship and meet the demanding conditions of Behavioral Health environments.

Designed for use in facilities where safety and security are of the utmost concern, Behavioral Health products meet the functional and quality requirements of these areas. The range has a comforting, residential feel and can be used in patient, lounge and group areas.

The comprehensive and flexible product offering includes beds, desks, casegoods and wardrobes, bedside cabinets, chests and seating. Custom solutions are available when unique requirements arise.

Beds

Behavioural health beds support up to 340kg and come with floor mount attachment that support up to 454kgs. The optional headboard creates a residential aesthetic while the edges all have a gentle radius for safety. The upholstered seat cushion and bolster offer a comfortable and safe sleep surface with optional secured drawers in the base that are engineered to be non-removable for patient and caregiver safety. Behavioural Health beds come with the Herman Miller Healthcare wood finish engineered for heavy use and frequent cleaning.

Desks

Behavioural Health Desks have multiple security attachments available to prevent furniture from being used improperly. All fasteners are tamper-resistent for patient and caregiver protection and shelves are reinforced and fixed in place for enhanced durability. Secured drawers are engineered to be non-removable for patient and caregiver safety and edges all have a gentle radius for safety.

Wardrobes and Casegoods

All casegoods feature vented back panels, optional locks on all doors and drawers, multiple security attachments, tamper-resistant fasteners and reinforced, fixed in place shelves. The Behavioural Health Wardrobe features a 60 degree sloped top to avoid items being hidden, a continuous hinge to add strength while preventing injury, recessed shelves to deter climbing, J bars on select models, tamper-resistant fasteners and multiple security attachments to prevent furniture from being used improperly.

Seating

The Behavioural Health Seating ranges from high use to lounge. High use seating features a wipe-out design to assist with infection control, sealed underside to prevent concealed items, no exposed hardware or "pick points" on upholstery or laminate, mortise and tenon joinery and 158kg dynamic weight load capacity. Lounge seating is heavy - weighing 45kg to prevent unintended use and features secure, soft urethane arm caps to prevent removal, damage and potential harm. Side panels are laminate wrapped for long lasting durability and the wipe-out design can assist with infection control. Tamper-resistant glides and spring seat construction are also features.

All Herman Miller Healthcare products are Greenguard Gold certified and backed by Herman Miller's 12 year, 3 shift, 7 day warranty.

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For more information on the Behavioural Health range or any Herman Miller Healthcare products visit **hermanmiller.com.au** or contact **info_au@hermanmiller.com**

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HermanMiller Healthcare

Modular methods to revolutionise construction for the healthcare sector

Compared to typical 'bricks and mortar' construction, modular projects are being completed in a fraction of the time, essentially changing the way the industry plans and develops new healthcare infrastructure.

Ausco Modular is a leader in the modular space with more than 50 years' experience designing, constructing and installing modular facilities for a range of industries and says its operations in the healthcare industry are expanding rapidly and for good reason.

Ausco Modular Director – Strategy and Business Development Ben Knight, said modular methods had come a long way from typical demountable buildings most people recognised to more impressive, permanent structures.

"Technology advancement means we are now able to offer modular solutions that are equal to their permanent counterparts in terms of construction, design and lifespan, but delivered within much shorter time frames," Mr Knight said.

"To put it into perspective, modular construction timelines are around 40 – 60% faster than in-situ projects, which is invaluable to healthcare providers who need to mobilise projects quickly, with minimal disruption to the existing site.

"Up to 80% of modular construction is completed off-site which automatically reduces the occurrence of typical construction disruptions like noise, dust, use of heavy machineryand large numbers of construction workers on site."

Mr Knight said with 80% of work occurring in a controlled factory environment the result was not only a more consistent, quality product but a safer experience for both workers and people around the site.

"We understand that many of our healthcare customers need to continue operations in some capacity during the construction period, which is very challenging to do safely with traditional buildings methods," he said.

"We are able to work closely with our customers to ensure they are receiving a tailored offering for their building design and the construction method so that the final product can be completely customised to the needs of the people who are using it.

"For example, a number of our aged care clients in Victoria and Queensland need to house elderly residents on-site while construction takes place to ensure they aren't disorientated or disrupted."

In addition, Mr Knight said customers had access to locally manufactured products which was a point of difference to some other suppliers.

"We have a big community focus and branches in every state which are locally staffed and use local suppliers and contractors wherever possible," he said.

"Because our buildings are manufactured locally, in many cases customers can safely visit our facilities to inspect the product which gives them insight into the process."

Mr Knight said Ausco Modular currently had a number of active projects in NSW and the ACT and a range of new projects in the pipeline for QLD and Victoria.

"As these technologies continue to develop, healthcare providers are uncovering the benefits of modular and are embracing the quality and versatility it offers," he said.

"Our access to local, national and global networks has allowed us to become leaders of the pack when it comes to providing first class construction solutions for the healthcare sector.

"We are able to give our customers more value through our partnership with the Algeco Scotsman group who are widely known as global leaders in the modular healthcare space."

Ben Knight
Ausco Modular Director – Strategy and Business Development

AUSCO MODULAR

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For more information on Ausco Modular and its healthcare offering visit **www.ausco.com.au** or call **13 62 11**.

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Faraday Pty Ltd also have the capability to provide a range of consulting services including EMF modelling and on- site ambient magnetic field testing to assess the suitability of proposed MRI sites within your building. Prudent site assessment can prevent costly redesigns by identifying siting problems before they occur.

We don't just design shielding solutions, we build them. Using the best products available on the market, Faraday Pty can design, build and coordinate a complete MRI shielding solution to suit any budget and any site. We have the knowledge, product support and trade network to deliver the best MRI shield on time and on budget.

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Notes on the Design of Hospitals and their Clinical Organisation:

Whitepaper by Andy Black

UK-based Andy Black is a consultant in strategic healthcare planning and offers an alternative to the established batterns of hospital design he has witnessed in his career. Below is an extract of his report.

I am under no internal pressure to persuade you to agree with the concepts set out here; but if you are involved in hospital planning, I would be pleased if it made you rehearse the philosophy of patient care that underpins your current approach to the design of tomorrow's hospital.

Firstly, we might see that the simple imperative to give each patient back their dignity and comfort has opened up a new way of managing their clinical care both individually and as the collective body of inpatients of the day.

The great majority of acutely ill citizens in today's (and tomorrow's) hospitals are older with more complex amalgams of morbidity, family and social issues. If a wide definition is used; to include depression, dementia and delerium - then a very significant proportion will also have mental health issues. The traditional organisation and design of the acute hospital is making life difficult when it should be doing the opposite.

What are the the great failures of today's hospitals? The increasing difficulty of matching patients' generalised needs to the growing specialisation of healthcare professionals.

Perhaps the most difficult job for any employee today is the personal care of a frail elderly demented person. To smell and clean up their faeces, change the urine

"This short paper sets out my personal observations based upon four decades of working in the hospital world. It is (I hope) a radical prospectus for the design of a very different hospital with a different approach to the organisation of clinical practice."

soaked bed; wipe their bum, wash their genitals, ears, hair, teeth. Cope with their disinhibited anger and occasional abuse.

The assumption that valuing this work at or around the minimum wage is a fair basis for high standards. Then assigning an army of higher paid inspectors to police the consequences. The repeated failure to introduce information systems that work as well as we can easily imagine that they could.

The arcane and convoluted approval and planning processes of our autistic state bureaucracies have delivered us a whole new generation of UK hospitals that were out of date on the day that they were opened.

A good start would be to burn all the official 'planning guidance' and talk to your mother, friend or relative who is in hospital with a complex condition. From there, think it through from the beginning, anew.

The hospital and its host city

By far the most important decision in planning a major hospital is "where to site it?" In the UK, the sponsor of the project is usually the existing hospital and the hospital community reserves this important decision to itself. More often than should be, the new hospital is built on the same site as the old one. Consultation with the general population and the civic authorities has more the dynamic of the sell-job than a genuine search for external inspiration.

I am struck by the answer given by a longstanding CEO of one of the largest city hospitals in the UK when asked what was the most important role of his hospital.

"Probably the most useful role of the [prestigious city-based hospital] is to provide employment and opportunity to a city where jobs are scarce."

The relationship between a large metro hospital and its host city is layered and important. In an earlier work we saw nine aspects to it, as shown opposite. For the major academic hospitals, I believe that separate 'healthcare planning' has led to an impoverished image of the hospital as something separated from its urban host.

A better approach might be to put all major hospital projects firmly into a civic planning arena.

Why?

If a major new hospital is planned as a civic asset rather than part of the national health network, then perhaps the integration of housing, education, culture, transport and commerce can be explored?

Why not embed housing, culture and leisure in the project? A large hospital campus at night can be a depressingly soul-less expanse of empty accommodation. Thousands of staff have to commute daily from housing areas - undoubtedly some of them would take up the opportunity of living and working in the same community - if those opportunities were for exciting and convivial homes. Why couldn't a senior clinician walk a short distance to meet his or her children from school when working late that evening? Or pop home to have lunch with a friend or partner? Why is the hospital cafeteria there but not an array of bars, cafes and restaurants? Why is the hospital cordoned from the city?

Ghettoed.

Here is another way of approaching the elements of hospital space: a simple hierarchy *[ed: which Black details in his whitepaper, viewable on our website]*

- Therapeutic space
- Immediate supporting space
- Blue space
- Green space
- Circulation
- Plant and closed spaces

This is a deliberate return to basic principles and requires a departure from traditional hospital planning. It undoubtedly takes us into more difficult discussions.

If those traditional planning processes were producing high quality new hospitals that were good value for money and environmentally sustainable, then this might be an unnecessary distraction.

My perspective is that they are not: we are getting obsolete duplicates of the industrial/efficient hospital paradigm. Worse, the overstatement of space needs against fixed levels of affordability delivers buildings that are mediocre in their materials and build standards as well as poorly conceived.

Worse yet, it all seems to take a very long time.

This is an extract of Andy Black's whitepaper *Notes on the Design of Hospitals and their Clinical Organisation*. To read the paper in full visit our website **www.hospitalhealth.com.au**

Andy Black

E andy@durrow.org.uk

Andy Black is based in the United Kingdom and known as an independent thinker in healthcare planning. His main focus is now on the organisation of acute care and the managed introduction of innovation into healthcare practice. He has been a consistent champion of the concept of the hypermodern local acute hospital and the local emergency unit in the face of a strong NHS consensus for centralisation in bigger units. His later work has examined the Academic Medical Campus of the future and its relationship with its host city. Andy is chairman of Durrow which is an international healthcare strategic consultancy active across public and private sectors.

Reusable vs Disposable Hospital Privacy Curtains

To reuse or not to reuse?

In recent years there's been growing hype surrounding the perceived infection control advantages of disposable privacy curtains in hospitals, but are we overlooking the benefits afforded by reusable curtains?

While disposable privacy curtains are great for high infection areas where it's important to be able to gather up all items for incineration, research gathered over the past decade suggests that the physical environment can significantly improve patient outcomes and expedite patient recovery [1, 2].

A less "clinical" physical environment helps patients relax and recover quicker, therefore in wards and other treatment areas it's important to create a homely feel. Reusable privacy curtains made of woven fabric add warmth and improve acoustic amenity, resulting in a dignified atmosphere conducive to patient recovery.

Given the above, decision makers face a dilemma when it comes to balancing infection control, ease of use and patient health outcomes.

Data gathered by linen services consultants Graham Jowsey & Associates sheds some light on common misconceptions surrounding both disposable and reusable privacy curtains and helps to establish the relative effectiveness of both options.

The source of the data is one major linen service provider and two hospital groups, one based in Sydney and the other in Melbourne.

Life expectancy

Both hospital groups advised that a good quality reusable curtain can last up to ten years if maintained in the correct fashion (i.e. washed to Australian Standard 4146), although there are a small proportion of stains, like with all hospital linen, that cannot be washed out.

On the other hand, a disposable curtain can hang for up to 12 months providing there is no obvious staining or wear-and-tear. That being said, this is very much dependent on individual facilities infection control (IC) protocols. In some instances, it is protocol to take down a disposable curtain after three months.

Washing costs

The ongoing washing costs associated with reusable privacy curtains are often used to support the cost effectiveness of disposable curtains, but the frequency of washing (and hence washing costs) largely depends on the IC policies of individual facilities. One hospital reported that the cleanliness of privacy curtains is inspected by ward staff daily, with soiled curtains being replaced immediately. The other advised their protocol is to wash privacy curtains approximately every three months unless there is obvious staining, in which case they would be replaced sooner.

The first hospital group had an on premise laundry (OPL) service and paid $2.50 - $3.00 per curtain per wash. The other hospital, also with an OPL service, paid $4.40 per curtain per wash.

To dry clean a reusable curtain costs approximately $9.50 per curtain and washing according to Australian Standard 4146 costs $7.92 per curtain.

Disposal costs

It is often overlooked that disposable privacy curtains incur disposal costs. In general, disposable curtains are considered general waste unless there is visible blood staining, in which case they become clinical waste.

Reusable vs disposable privacy curtains: A lifetime cost comparison

	Maximum Life	Purchase Price	Wash Cost	Hanging Cost	Disposal Cost	Total Annual Cost
Reusable	10 years x 1 wash per year	$220	$79.20	$20	$0	$31.92
	10 years x 4 washes per year	$220	$316.80	$80	$0	$61.68
	5 years x 1 wash per year	$220	$39.60	$10	$0	$53.92
	5 years x 4 washes per year	$220	$158.4	$40	$0	$83.68
Disposable	1 x change per year	$35.50	$0	$2	$1.10	$38.60
	4 x changes per year	$142	$0	$8	$4.40	$154.40
	6 x changes per year	$213	$0	$12	$6.60	$231.60

One hospital paid $0.33 - $0.43 per/kg for general waste and $0.72 per/kg for clinical waste. The other hospital couldn't give specific numbers, but claimed they paid five times more per kilo for disposal of clinical waste as compared to general waste.

As a comparison, the 2002 Auditor General's report on NSW Hospitals Waste Disposal found that Concord Hospital's costs were $0.109 per/kg for general waste and $0.93 per/kg for clinical waste.

For the sake of comparison, the average of both sets of figures works out at $0.30 per/kg for general waste and $0.80 per/kg for clinical waste.

Conclusion

The relative efficiency of each curtain type depends largely on the IC policies of individual hospitals, including policies relating to hang time, acceptable levels of soiling and washing standards.

These variables as well as the unpredictability of a curtain being stained before it's due for replacement (resulting in higher washing and/or disposal fees) make it almost impossible to produce exact figures that apply across the board.

All groups surveyed felt that disposable privacy curtains were more effective for infection control, mostly based on information provided by their disposable curtain suppliers. Therefore the general feeling is that hospitals are slowly moving towards complete adoption of disposable privacy curtains in all areas.

On a more subjective level, it's fair to say that disposable privacy curtains are to ward interiors what styrofoam cups are to restaurants, easy to dispose of but in some cases more expensive and always less attractive.

Research suggests that far from only being an aesthetic concern, hospitals that are designed and furnished in a less "clinical" way have better patient health outcomes and recovery times [1, 2].

Therefore reusable curtains play an important part in the healing process, something that cannot be claimed of disposable privacy curtains.

Finally, when considering pricing it becomes obvious that the determining factor in choosing the most effective product directly relates to the frequency of washing reusable curtains and/or the rate at which disposable curtains are replaced.

The attached table shows that as soon as a disposable privacy curtain is changed four times a year, it loses its financial benefit (when compared to a reusable curtain that is washed four times per year for a five year period).

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The B5 was also awarded the 2014 Bronze IDEA (International Design Excellence Awards) winner for design excellence. New to Tennant's user-friendly design are easy to identify yellow maintenance touch points and onboard reference manuals to help eliminate equipment breakdowns and maximise machine uptime. The burnishing head also tilts up and locks at 90 degrees to ensure a safe ergonomic position when changing the machine's pad. This process allows the operator to safely, easily and consistently center the pad to deliver uniform burnishing results.

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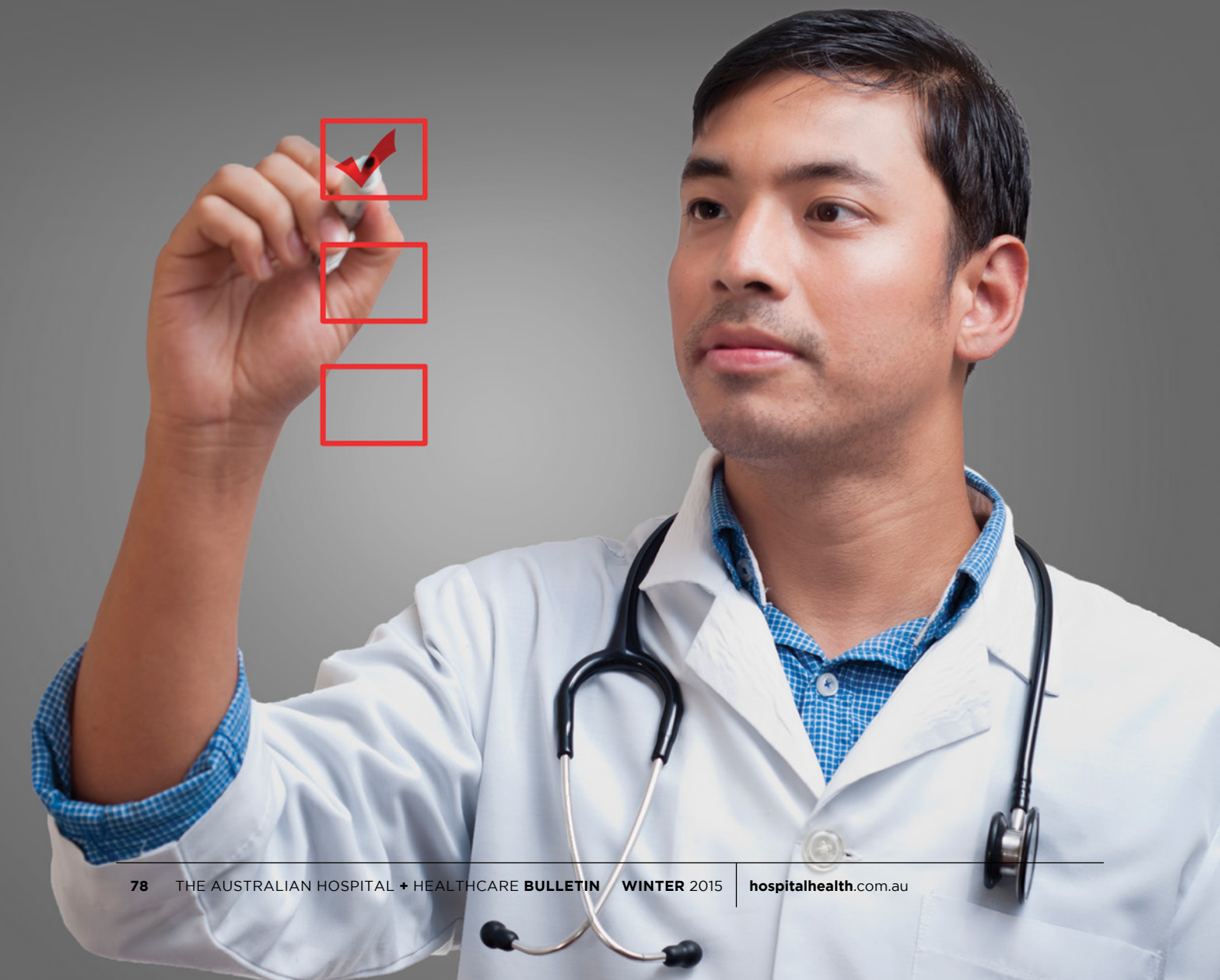
Evaluating the impact of the National Safety and Quality Health Service Standards

The National Safety and Quality Health Service (NSQHS) Standards provide a nationally consistent statement about the level of care consumers can expect from health service organisations and were introduced to protect patients from harm and drive quality improvement.



The Commission is currently conducting an evaluation of the impact of the NSQHS Standards.

What is the aim of the evaluation?

The evaluation aims to answer three questions:

- Have the NSQHS Standards made a difference to patient safety and the quality of care and what impact have they had?
- Have relevant objectives been achieved?
- How might the impact of the NSQHS Standards be measured into the future?

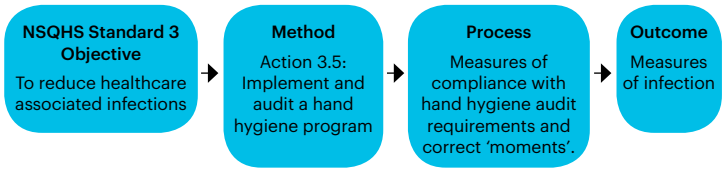
These questions are being considered at a macro level (national, state/territory or professional body), rather than at the individual health service level.

How is the evaluation being done?

Multiple sources and approaches are being used to identify changes in processes and outcomes that have occurred since the implementation of the NSQHS Standards.

For each of the 10 NSQHS Standards, key objectives were identified and from these relevant possible measures of processes and outcomes were identified. For example, *NSQHS Standard 3: Preventing and controlling healthcare associated infections (NSQHS Standard 3)* requires health service organisations to maintain hand hygiene programs and audit compliance (Figure 1). Uptake of hand hygiene activities and reported compliance rates since the implementation of the NSQHS Standards are process measures. Whether the objective of reducing infections has been achieved can only be measured by actual infection rates.

Figure 1. Evaluation framework applied to NSQHS Standard 3



This is a complex evaluation, in part because of the difficulties in retrospectively assessing national change in a heterogeneous health system with multiple factors contributing to change. Some aspects of the NSQHS Standards have been the focus of jurisdictional, clinical or other program initiatives prior to their introduction (for example, pressure injury and falls prevention programs). Nonetheless, the project is identifying useful sources of information that will help to track current and future outcomes in the areas covered by the NSQHS Standards.

Why look at the impact on processes?

While improvements in patient outcomes are the ultimate goal, and are being assessed for the evaluation, measuring the impact on processes is vital as it provides insight into whether implementation has been successful. Given the relatively early stage of implementation, measuring changes in process outcomes may also be useful where it is too early to expect to see changes in outcomes. Process evaluation can also help clarify whether or not it is reasonable to attribute any changes in various outcomes to implementation of the NSQHS Standards.

> "Measuring the impact on processes is vital as it provides insight into whether implementation has been successful."

What data sources are being used?

The evaluation includes quantitative and qualitative approaches, and a range of data sources. As far as possible, existing routine data sources are being used, in order to limit the need for additional data collection.

Data sources include administrative hospital morbidity data, infections surveillance data, clinical incident systems, clinical registries and other existing data collections. Specific outcomes being considered include rates of healthcare associated infections, falls, pressure injuries, medication-related adverse events as well as any impact on cardiac arrest rates potentially resulting from better management of the acutely deteriorating patient.

In addition, some research is being conducted by the Commission to assess the impact of specific standards, including NSQHS Standards 1, 2, 3 and 9.

Table. Data sources for evaluation of the impact of the NSQHS Standards

• Interviews, data gathering and consultation with stakeholders
• Surveys of health professionals and governance bodies
• Interrogation of routine data collections
• Clinical quality improvement systems and registries

Next steps

The evaluation of the NSQHS Standards is due for completion in December 2015. The findings will be used to refine the NSQHS Standards and ensure they are achieving their objectives, together with the review being conducted by the Commission.

For more information about the NSQHS Standards, visit **www.safetyandquality.gov.au/our-work/accreditation-and-the-nsqhs-standards/**

You can also sign up to receive email newsletter updates or follow the Commission on Twitter **@ACSQHC.**

New Acute Coronary Syndromes Clinical Care Standard

Acute coronary syndromes (heart attacks and suspected heart attacks) affect thousands of Australians. In 2011, approximately 69,900 Australians aged 25 and over had a heart attack. That's around 190 hearts attacks a day.[1]

Despite well-developed guidelines for managing acute coronary syndromes, recent research has found that not all patients receive appropriate therapies, particularly for invasive management of this condition.[2] Research has also highlighted the logistical challenges of providing timely invasive management to patients in regional, remote and outer metropolitan areas.[2]

The Australian Commission on Safety and Quality in Health Care (the Commission) has developed the Acute Coronary Syndromes (ACS) Clinical Care Standard in collaboration with consumers, clinicians, researchers and health service organisations. The ACS Clinical Care Standard aims to ensure a patient with an acute coronary syndrome receives optimal treatment from the onset of symptoms through to discharge from hospital, regardless of the patient's location within Australia.

The ACS Clinical Care Standard describes the care a patient with a suspected acute coronary syndrome should be offered from the onset of symptoms to the completion of treatment in hospital. It covers recognition of an acute coronary syndrome, rapid assessment, early management and early initiation of a tailored rehabilitation plan. The ACS Clinical Care Standard complements existing efforts supporting the delivery of appropriate care, such as national initiatives led by the National Heart Foundation, and state and territory-based initiatives led by cardiac networks.

The ACS Clinical Care Standard consists of six quality statements developed for use in hospitals and other healthcare settings:

1. A patient presenting with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives care guided by a documented chest pain assessment pathway.

2. A patient with acute chest pain or other symptoms suggestive of an acute coronary syndrome receives a 12-lead electrocardiogram (ECG) and the results are analysed by a clinician experienced in interpreting an ECG within 10 minutes of the first emergency clinical contact.

3. A patient with an acute ST-segment-elevation myocardial infarction (STEMI), for whom emergency reperfusion is clinically appropriate, is offered timely percutaneous coronary intervention (PCI) or fibrinolysis in accordance with the time frames recommended in the current National Heart Foundation of Australia Cardiac Society of Australia and New Zealand Guidelines for the Management of Acute Coronary Syndromes.[3]

   In general, primary PCI is recommended if the time from first medical contact to balloon inflation is anticipated to be less than 90 minutes, otherwise the patient is offered fibrinolysis.

4. A patient with a non-ST-segment-elevation acute coronary syndrome (NSTEACS) is managed based on a documented, evidence-based assessment of their risk of an adverse event.

5. The role of coronary angiography, with a view to timely and appropriate coronary revascularisation, is discussed with a patient with a NSTEACS who is assessed to be at intermediate or high-risk of an adverse cardiac event.

6. Before a patient with an acute coronary syndrome leaves the hospital, they are involved in the development of an individualised care plan. This plan identifies the lifestyle modifications and medicines needed to manage their risk factors, addresses their psychosocial needs and includes a referral to an appropriate cardiac rehabilitation or another secondary prevention program. This plan is provided to the patient and their general practitioner or ongoing clinical provider within 48 hours of discharge.

The Commission has developed a range of resources for clinicians and health service organisations to assist with implementation of the ACS Clinical Care Standard, including tools for local monitoring and evaluation, and fact sheets for clinicians and patients.

The Commission's Clinical Care Standard program focuses on reducing the gap between what we know works, based on best available evidence, and what care is actually offered to patients.

For more information, and to download the ACS Clinical Care Standard and resources, visit **www.safetyandquality.gov.au/ccs.**

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References

1 http://www.eggs.org.au/

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Grant Kardachi

Grant Kardachi was recently re-elected president of the Pharmaceutical Society of Australia for a fourth term. He is a community pharmacist who recently sold his business interests but is still accredited to undertake medication reviews and sits on the Australian Association of Consultant Pharmacy.

Effectiveness and Safety of Complementary Medicines

The growing consumer awareness of health issues, and the trend towards seeking non-traditional methods of treatment in some cases, has seen a surge in the use of complementary medicines in Australia, writes *Grant Kardachi.*

It has been estimated that as many as two in three Australians use at least one complementary medicine on a regular basis. Many pharmacies stock a range of complementary medicines and pharmacists are an important source of advice about complementary medicines.

Like all other medicines, complementary medicines available in Australia are regulated by the Therapeutic Goods Administration. Complementary medicines include herbs, vitamins and minerals, nutritional supplements, homeopathic medicines, traditional medicines such as traditional Chinese medicines, Ayurvedic medicines and Australian Indigenous medicines. In addition, certain aromatherapy products are categorised as complementary medicines.

"Quality research into the effectiveness and safety of complementary medicine is increasing as demand for these products grows but there remains a lack of information about their effectiveness, side effects and possible interactions."

All medicines, including complementary medicines, must be accepted onto the Australian Register of Therapeutic Goods (ARTG) before they can be marketed in Australia. In May 2011 there were more than 10,000 complementary medicines on the ARTG. When assessing medicines for inclusion on the ARTG, the TGA places them into one of two categories:

- Higher risk products are individually assessed for quality, safety and effectiveness. If they are approved, they are included on the ARTG as Registered medicines and carry an identifying 'AUST R' number. A product must also undergo this registration process if the manufacturer wants to claim that it will 'cure, manage, treat or prevent' a disease or disorder.
- Lower risk products are assessed for the quality and safety of their ingredients, but not for effectiveness. Approved products are included on the ARTG as 'Listed medicines' and carry an identifying 'AUST L' number. Listed products may only carry claims for health maintenance and health enhancement, or for symptom relief in non-serious, self-limiting conditions. Manufacturers of Listed medicines are required to hold evidence to support claims made for their products. This evidence may be audited by the TGA. Most (but not all) complementary medicines on the ARTG are Listed medicines.

Compared to interactions between conventional medicines, little is known about herb-drug (or herb-herb) interactions, although this situation is changing as more complementary medicines undergo quality clinical trials. This is partly due to a lack of scientific studies and partly due to the variability of herbal products. Some herbs can alter the way other medicines are absorbed or metabolised in the body. St John's wort is the herb best known for interacting with other medicines. It reduces the therapeutic effects of many medicines by increasing their metabolism (i.e. causing them to be broken down more rapidly in the body). Combining St John's wort with other medicines can lead to serious consequences including organ rejection (e.g. cyclosporin), worsening of HIV-AIDS (e.g. indinavir), risk of blood clots (e.g. warfarin) and breakthrough bleeding or unwanted pregnancy (e.g. oral contraceptives).

Some herbs may have therapeutic effects which are similar or opposite to those of a conventional medicine. Taking the herbal and conventional medicines together may result in the effects of the conventional medicine being either increased or reduced.

For example, many herbs (including evening primrose oil, fish oil, garlic and ginkgo) can increase the risk of bleeding when taken with medicines that prevent blood clotting (e.g. aspirin, warfarin). St John's wort can increase the effects of antidepressants, and also increase the risk of potentially dangerous side effects. The effects of sleeping tablets and tranquilisers may be reduced by guarana.

Quality research into the effectiveness and safety of complementary medicine is increasing as demand for these products grows but there remains a lack of information about their effectiveness, side effects and possible interactions. However, a lack of scientific evidence does not mean that a complementary medicine is ineffective; it may be that the medicine has not been assessed in good-quality clinical trials.

Evaluating the results of clinical trials is complicated by the fact that there are many different forms and preparations of herbs and 'natural' products.

A herbal product may be produced from the leaves, stems, flowers, roots or seeds of a plant. Herbal medicines may contain a single herb or a combination of several different herbs.

They may contain many hundreds, or even thousands, of different 'phytochemicals', and different parts of the plant may contain different proportions of these chemicals. Indeed, two batches of the same herbal product may differ significantly in their therapeutic activity.

Clearly consumers should speak to their pharmacist about any complementary medicines and any possible interactions they may have with medicines the person is already taking. The pharmacist is the medicines expert and can provide the best advice to help improve the consumer's health through quality use of medicines.

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Versatile functionality

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- D.I.O and firtree outlets enable both suction and oxygen delivery

Convenient and easy-to-use

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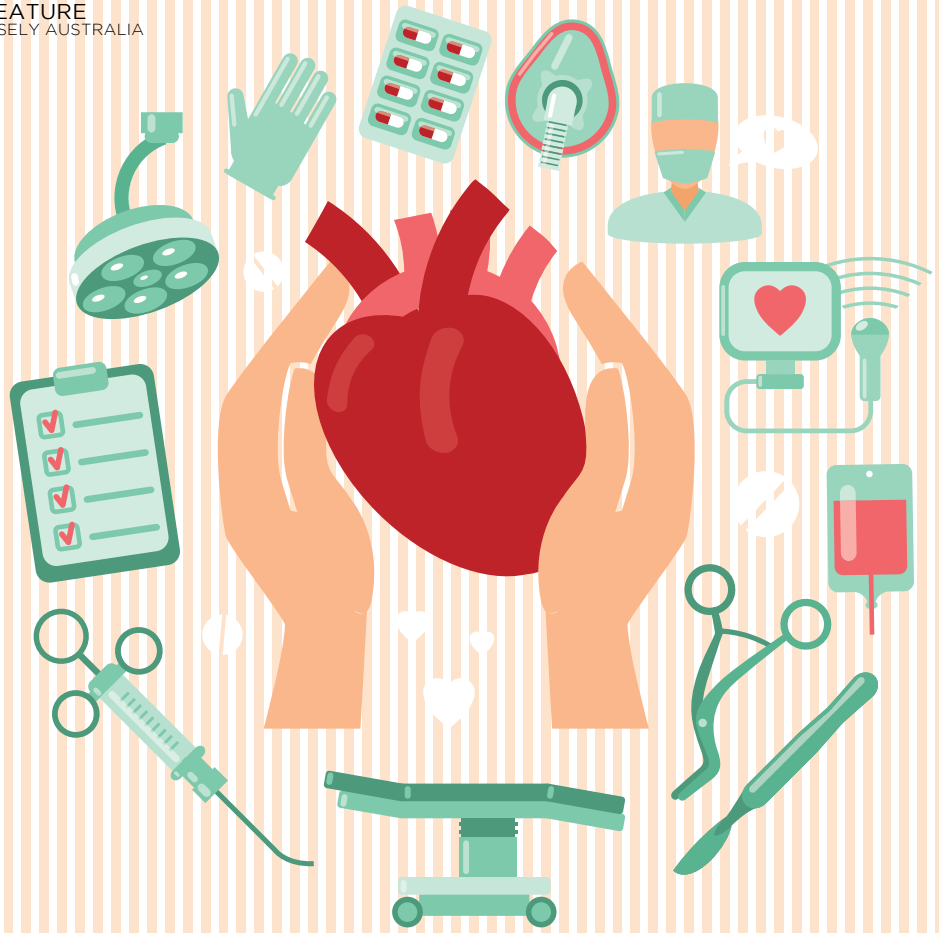
* compared to standard C size cylinder with a capacity of 0.57m³



More is not Always Better

Choosing Wisely Australia - improving care by tackling unnecessary practices

By Dr Matthew Anstey

Stand first: Choosing Wisely Australia® is a new initiative aimed at sparking an important national conversation about the many unnecessary and sometimes harmful tests, treatments and procedures entrenched in the health system. It promises significant benefits for hospitals.

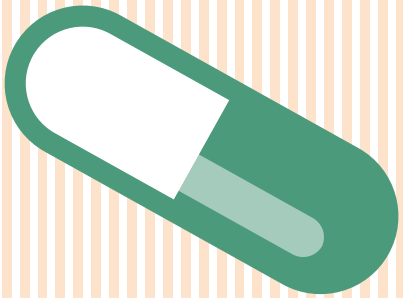
The launch last month of Choosing Wisely Australia marks the beginnings of what is hoped will be a fundamental change in the way we approach medical practice and patient care.

Its aims are to improve care by addressing the many inappropriate, unnecessary and often obsolete interventions that remain in common use. They often lead to additional and often invasive investigations, exposing consumers to undue risk of harm, emotional stress and financial cost. Importantly, they are a diversion from high quality care.

Choosing Wisely Australia is drawing on the expertise of Australia's peak professional bodies to develop lists of questionable practices. Five medical colleges and societies encompassing a large area of practice – have conferred with their members and released their recommendations: Five things clinicians and consumers should question. These are based on the best available evidence, expert opinions and research.

Out of this, material is being developed to equip health professionals and consumers with the sound science and evidence they need to make informed decisions and to engage in frank conversations about what care is truly needed. Under the slogan 'more is not always better', the aim is to show that not all tests, treatments and procedures are in the consumer's best interest.

The initiative is being facilitated in Australia by NPS MedicineWise, an organisation that has established itself as respected and influential voice in quality use of medicines and medical tests. .



The issue of wasteful, obsolete, unsafe or evidence-lacking interventions is global and for the past decade, there has been growing recognition of the need to tackle them. Many studies have sought to identify the practices that most urgently need addressing but progress has been slow in translating this into changes to medical practice.

That is, until Choosing Wisely. The Choosing Wisely® movement is proving successful in the United States where it was launched in 2012 by the ABIM Foundation. What started modestly with nine organisations is now a collaboration of more than 70 medical speciality societies, as well as consumer organisations that collectively represent almost a million members.

What makes Choosing Wisely unique is that it is physician-led and it pursues change from the bottom up, uniting with patients to act across all areas of healthcare. After three years, the US initiative can justifiably claim that the long-overdue cultural shift it set out to create is beginning to emerge.

Choosing Wisely Australia and hospital care

We are hearing more and more about optimising value in healthcare. The value equation is the balance between the cost and the outcome. Some countries are increasingly focusing on trying to eliminate waste in healthcare, as waste does not improve the outcome, but does increase the cost. Evidence from the US suggests that up to 30% of all medical spending is unnecessary and does not add value to care. The recommendations set out in the Choosing Wisely Australia lists will not remove all of those unnecessary treatments, but the overarching, and perhaps more important aim, is to encourage doctors and patients to start looking to identify those practices that should be questioned.

Those working in hospitals know that there are many investigations and medications ordered routinely for patients. For instance, many patients receive daily blood tests or chest X-rays. There is increasing evidence to show that these routine investigations do not improve the care of patients yet add to healthcare costs. In addition, any test or medication can cause unintentional harm to patients from adverse drug reactions, false positive results and cumulative radiation exposure. Furthermore, some procedures performed may be of limited benefit to patients and expose them to potential harm. The Choosing Wisely Australia campaign aims to focus the attention of clinicians and patients on these low value or unnecessary items.

Partner organisations and their recommendations

The first medical colleges and societies to participate in the Choosing Wisely Australia initiative are: the Australasian College of Emergency Medicine, the Australasian Society of Clinical Immunology and Allergy, the Royal Australian College of General Practitioners, the Royal Australian and New Zealand College of Radiologists and the Royal College of Pathologists of Australasia. Each of these has provided lists of recommendations. The Royal Australasian College of Physicians (as the coordinating body for RACP members and specialty societies) is supportive of Choosing Wisely Australia through the shared goals of its Evolve program.

Many other organisations will join Choosing Wisely Australia as part of Wave 2. As more specialist groups join the initiative, more lists will be created. These lists will provide an immediate opportunity for hospitals to review their practices and identify ways they can adopt some of the recommendations. They may also spark new ideas and new approaches to address other potential targets for reducing waste within the hospital system.

The first iteration of Choosing Wisely Australia includes items from the colleges representing emergency medicine, pathology and radiology – areas that directly relate to hospital care. While organisations have been asked to provide five recommendations, it is anticipated that more will be added over time. Two colleges, the Australasian College for Emergency Medicine and the Royal Australian and New Zealand College of Radiologists found they had overlapping recommendations and have presented them jointly in addition to their own lists.

How Choosing Wisely is making a difference in American hospitals

The Choosing Wisely campaign has provided an opportunity for some of the eminent US healthcare systems to take a leadership role in the responsible management and fair distribution of healthcare resources.

While undertaking a fellowship at Kaiser Permanente, one of the largest integrated health systems in the world, I was fortunate to see up-close how they thought about the Choosing Wisely campaign. Departmental heads were asked to systematically review the Choosing Wisely recommendations, and to focus on the recommendations that related to conditions seen frequently amongst patients in their system.

For example, Kaiser Permanente Colorado focused on reducing imaging overuse for low probability pulmonary embolism, low back pain, syncope and uncomplicated headaches. Their audits subsequently showed that up to 25"% of the imaging for uncomplicated headaches may have been unnecessary.

Other large health systems in the US have also introduced the recommendations to their practice. Fletcher Allen in Vermont reduced the utilization of daily chest X-rays in ICU patients by one-half, and the number of tests of kidney function in patients on permanent dialysis or admitted to hospital for another reason from more than 1,300 per 1,000 patient days to fewer than 200 per 1,000 days.

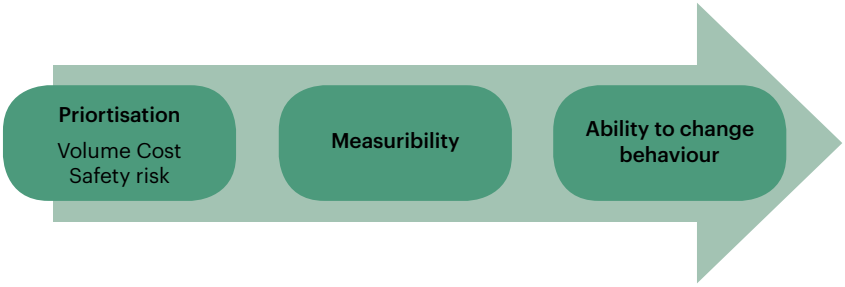
Cedars-Sinai Health system became the first system to incorporate many of the Choosing Wisely recommendations into its electronic medical records system. When a physician attempts to order a test or treatment referenced on the Choosing Wisely lists, an alert provides more information to the physician before they can proceed with it. →

→ Principles to consider in a hospital or health system

The Choosing Wisely Australia lists of recommendations provide an initial guide for clinician leaders and hospital executives. From my experience in the US, I suggest selecting one or two items to focus on that are aligned with any current quality reforms underway in the hospital.

To select these items, it is important to understand which are important to the clinicians and patients within your system. One way to determine which elements are a priority is to characterise them according to three variables: volume, cost and risk. [Figure 1] An item may be high volume but low in cost and of minimal risk to patients, and therefore of less importance than a high cost, high risk, moderate volume one.

After prioritising the items, determine whether your organisation can measure the use of the item (or what would need to be put in place to do this). Finally, talk to the clinician groups about whether they believe that they can change their usage patterns for the each of the items. The use of audit and feedback, when combined with an institutional focus, is a powerful method of creating change.



Dr Matthew Anstey
MBBS FACEM FCICM MPH

Dr Matthew Anstey is an Intensive Care and Emergency Medicine specialist physician who has practiced in a variety of settings across Australia, and in the US at Harvard Medical School and the Beth Israel Deaconess Medical Center.

He has a Masters of Public Health in health policy from Harvard School of Public Health and was awarded the prestigious Commonwealth Fund Harkness Fellowship in Health Policy in 2012-13.

The fellowship was based at Kaiser Permanente in California. During his time there, Dr Anstey sat as an observer on the hospital's National Guideline committee and was able to see their efforts in implementing Choosing Wisely for their organisation.

Following the fellowship, he worked as a research consultant for Stanford University Clinical Excellence Research Center on a project to identify "high value" health-care organisations, and the potentially-transferable features of models of care. He now works as an intensivist at Sir Charles Gairdner Hospital and as a part-time senior medical advisor to the Australian Commission on Safety and Quality in Health Care. He is an advisory board member for Choosing Wisely Australia and a committee member of the WA Council on Safety and Quality in Health Care. His research interests lie at the intersection of quality improvement and behaviour change.

NPS Medicinewise

Since its inception in 1998, NPS MedicineWise has been the leading body driving quality use of medicines and medical tests in Australia. It does this in an evidence-based and highly collaborative way.

Independent and not-for-profit, NPS MedicineWise works with member organisations, industry and professional organisations, consumers and government and seeks advice from a broad range of expert advisors to positively change attitudes and behaviours about medicines and medical tests so that consumers and health professionals are equipped to make the best decisions when it counts.

College and society list recommendations

Royal Australian College of General Practitioners

1. Don't use proton pump inhibitors (PPIs) long term in patients with uncomplicated disease without regular attempts at reducing dose or ceasing.
2. Don't commence therapy for hypertension or hyperlipidaemia without first assessing the absolute risk of a cardiovascular event.
3. Don't advocate routine self-monitoring of blood glucose for people with type 2 diabetes who are on oral medication only.
4. Don't screen asymptomatic, low risk patients (<10% absolute 5-year CV risk) using ECG, stress test, coronary artery calcium score, or carotid artery ultrasound.
5. Avoid prescribing benzodiazepines to patients with a history of substance misuse (including alcohol) or multiple psychoactive drug use.

Royal College of Pathologists of Australasia

1. Don't perform surveillance urine cultures or treat bacteruria in elderly patients in the absence of symptoms or signs of infection.
2. Don't perform PSA testing for prostate cancer screening in men with no symptoms and whose life expectancy is less than 7 years.
3. Don't perform population based screening for Vitamin D deficiency
4. Don't perform serum tumour marker tests except for the monitoring of a cancer known to produce these markers.
5. Don't routinely test and treat hyperlipidemia in those with a limited life expectancy.

Australasian College for Emergency Medicine

1. Avoid requesting computed tomography (CT) imaging of kidneys, ureters and bladder (KUB) in otherwise healthy emergency department patients, age <50 years, with a known history of kidney stones, presenting with symptoms and signs consistent with uncomplicated renal colic.
2. Avoid coagulation studies in Emergency Department patients, unless there is a clearly defined specific clinical indication, such as for monitoring or anticoagulants, or in patients with suspected severe liver disease, coagulopathy, or in the assessment of snakebite envenomation (POCT devices are unreliable in this circumstance).
3. Avoid blood cultures in patients who are not systemically septic, have a clear source of infection and in whom a direct specimen for culture (e.g. urine, wound swab, sputum, cerebrospinal fluid, or joint aspirate) is possible.
4. For emergency department patients approaching end-of life, ensure clinicians, patients and families have a common understanding of the goals of care.
5. Don't request imaging of the cervical spine in trauma patients, unless indicated by a validated clinical decision rule. (jointly with RANZCR)
6. Don't request computed tomography (CT) head scans in patients with a head injury, unless indicated by a validated clinical decision rule. (jointly with RANZCR)

Royal Australian and New Zealand College of Radiologists

1. Don't request imaging for acute ankle trauma unless indicated by the Ottawa Ankle Rules (localised bone tenderness or inability to weight bear as defined in the Rules).
2. Don't request duplex compression ultrasound for suspected lower limb deep venous thrombosis in ambulatory outpatients unless the Wells score (deep venous thrombosis risk assessment score) is greater than 2, OR if less than 2, D-dimer assay is positive.
3. Don't request any diagnostic testing for suspected pulmonary embolism (PE) unless indicated by Wells Score or Charlotte Rule followed by PE Rule-out Criteria (in patients not pregnant or postpartum). Low risk patients in whom diagnostic testing is indicated should have PE excluded by a negative D-dimer, not imaging.
4. Don't perform imaging for patients with non-specific acute low back pain and no indicators of a serious cause for low back pain.
5. Don't request imaging of the cervical spine in trauma patients, unless indicated by a validated clinical decision rule. (jointly with ACEM)
6. Don't request computed tomography (CT) head scans in patients with a head injury, unless indicated by a validated clinical decision rule. (jointly with ACEM)

Australasian Society of Clinical Immunology & Allergy

1. Don't use antihistamines to treat anaphylaxis: prompt administration of adrenaline is the only treatment for anaphylaxis.
2. Alternative/unorthodox methods should not be used for allergy testing or treatment.
3. Allergen immunotherapy should not yet be used for routine treatment of food allergy: research in this area is ongoing.
4. Food specific IgE testing should not be performed without a clinical history suggestive of potential IgE-mediated food allergy.
5. Don't delay introduction of solid complementary foods to infants: ASCIA Infant Feeding Advice recommends early introduction of solid foods to infants (from 4-6 months old).

Australasian Society for Ultrasound in Medicine Certification Program

The Australasian Society for Ultrasound in Medicine (ASUM) brings nationally benchmarked ultrasound education and training to Australia and New Zealand through its various educational programs. Here Tanya Carleton, ASUM Education Projects Manager, discusses some of the recent successful developments in the Certificate of Clinician Performed Ultrasound (CCPU) and Certificate for Allied Health Performed Ultrasound (CAHPU) Program including providing ultrasound education and training to Australia's rural and remote midwives, the CCPU's Neonatal Special Interest Group (SIG) and developments in the use of ultrasound simulators.

Bringing Nationally Benchmarked ultrasound Education and Training to Australia's Red Heart: The Certificate of Allied Health Performed Ultrasound (CAHPU) Rural and Remote Midwives Education and Training

Of the Aboriginal population living in the Northern Territory, most residents live outside the cities of Darwin and Alice Springs in very remote, small and very scattered communities with large distances between them. These communities may not have resident midwives or GPs or if they do, these professionals may not be trained to perform ultrasound examinations. Healthcare services in these communities may only be accessible by air and wet season flooding makes airstrips unusable, leading to further isolation for women needing gynaecological and obstetric healthcare services. In cases where healthcare providers fly into remote communities they could be faced with the responsibility of providing not only obstetric and gynaecological care but having to provide a broader range of healthcare services covering many specialties. Lack of access to adequate equipment can mean that women may not be able to have an ultrasound examination early in their pregnancy. High rates of smoking as well as pre-existing medical conditions and socioeconomic disadvantages result in high-risk pregnancies being more prevalent in Aboriginal and Torres Strait Islander women who experience higher rates of pre-term birth. In Australia, Aboriginal and Torres Strait Islanders also have the highest rates of maternal and infant mortality. For these reasons the healthcare setting in rural and remote communities has been described as that of a third or fourth world.

Training and retaining doctors and midwives is another challenge experienced in rural and remote communities. ASUM recognised this challenge and, through its outreach program, partnered with the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG) and doctors Sujatha Thomas, Nayana Parange, Martha Finn, Russell Carter; sonographers Roger Weckert, Clare Whitehead, and Karen Shand as well as Amanda Grauze, simulator educator and Director, Medical Synergies, Western Australia. This group came together in late 2014 to teach a basic ultrasound training education and skills workshop to twenty rural and remote midwives in the Northern Territory. Participants were able to practise and develop their ultrasound scanning skills using simulators as well as pregnant patients. This workshop gave midwives the education and skills needed to apply their point of care ultrasound knowledge immediately within their communities. The team were able to teach the curriculum developed by ASUM for the Certificate of Allied Health Provided Ultrasound, Midwife specific units: Early Pregnancy Assessment and Monitoring the Fetus (2nd and 3rd trimester). This curriculum, combined with the hands-on training needs of rural and remote midwives, allows the delivery of nationally benchmarked education which will facilitate higher levels of care to the most needed parts of our nation. The next educational event of this kind will be held in Whyalla, South Australia, June 18th-19th, 2015. ASUM further supports the continual training and professional development of rural and remote midwives by offering administrative services and support. ASUM has an extensive networks of supervisors and assessors who perform various roles to support, guides and mentor candidates through the requirements of the CAHPU program which include

recording ultrasound examinations in a logbook and submitting this logbook for assessment as well as performing three ultrasound examination skills assessments. These services help midwives and other candidates progress through their program and earn their ultrasound qualification, the Certificate of Allied Health Performed Ultrasound (CAHPU).

ASUM Special Interest Groups

Because ASUM represents all users of ultrasound they work with many different interest groups, including Neonatal specialists throughout Australia and New Zealand. The ASUM Neonatal Special Interest Group (SIG) began in 2008 as a subcommittee of the CCPU Board. The Neonatal SIG's mission is to spread nationally benchmarked ultrasound education and training that is specific to neonatology throughout Australia and New Zealand.

The SIG ensures that the high quality and standard of excellence is maintained in the program through meetings to discuss features of the program, and quality standards, review guidelines and make any changes or updates.

Neonatal ultrasound qualifications are available through ASUM via the CCPU for doctors and now also to neonatal nurse practitioners through the CAHPU qualification. Both qualifications include a comprehensively structured program of introduction and advanced neonatal ultrasound education and clinical skills training. Features of the training include small group sizes limited to twenty participants a well as the inclusion of local cardiologists to add their expertise to the training. Participants also gain experience on ultrasound simulators before scanning infants in these programs.

The ASUM Neonatal SIG has been recognised as a world leader in establishing specialty specific ultrasound training throughout their profession and ASUM is enthusiastic about using this example to create more SIGs to serve other users of ultrasound including but not limited to: nurses, midwives, paramedics, rheumatologists, podiatrists, physiotherapists and others.

Safe Practice of Ultrasound and the Growing Use of Simulators

As the Peak Body for ultrasound in Australia and New Zealand, ASUM is working with providers of ultrasound simulators. Ultrasound simulators are becoming more and more sophisticated and are currently used in a wide variety of areas. They include procedural simulators such as vascular access and pleural aspiration phantoms and non-procedural simulators such as those used in obstetrics and gynecology, trans-oesophageal echo, and trans-thoracic echo. As more sophisticated simulators become available for use ASUM recognises the value that these tools can play in the training of ultrasound trainees. Simulators offer trainees who have not had any scanning experience the ability to practice their basic skills on a model before ever performing an ultrasound examination on a patient. The Neonatal SIG has found this training tool to be incredibly effective for trainees who have no scanning experience, noting that trainees, when they have witness in overseas meetings, demonstrate much better scanning skills when they do eventually begin scanning patients. This is highly valued in neonatal applications where doctors and neonatal nurses are working with infants who move and wriggle and are sometimes not available to perform an ultrasound examination on. Simulators are part of the future of ultrasound training here in Australia and members of the ASUM CCPU Neonatal SIG are actively involved in developing and introducing simulators for neonatal application in Australia.

Tanya Carleton, M Ed, Dipl TCM, B.Sc, is ASUM Education Project Manager

Eliza Welch is ASUM CCPU and CAHPU Programs Coordinator

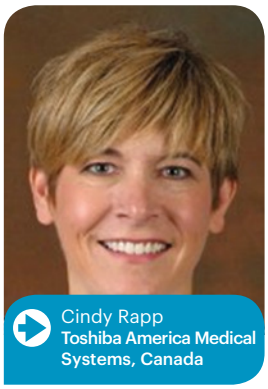

Prof Christoph Lees
Imperial College, London


Prof Aris Papageorghiou
Oxford University, UK


Prof Tom Bourne
Queen Charlotte's & Chelsea Hospital, UK


Prof Frank Miele
Pegasus Lectures, USA


Prof Thomas Fischer
Charite' Campus Mitte, Germany


Cindy Rapp
Toshiba America Medical Systems, Canada

Join us in Sydney for the 45th Annual Scientific Meeting of the Australasian Society for Ultrasound in Medicine

An innovative program headlined by high profile international speakers, complimented by hands on scanning workshops. We anticipate this to be a cutting edge program to meet the needs of all practitioners involved in ultrasound and look forward to welcoming you to the 2015 Congress 11-13th September.

The theme for this year's Annual Scientific Meeting is New ideas, New technologies, New applications. This innovative theme aptly predicts the breadth and scope of a scientific program which represents the international quality of ultrasound use in Australia and New Zealand.

On the international stage, ASUM researchers and clinicians are leaders in the diagnostic use of medical ultrasound and they look forward to sharing their knowledge and skill with this year's delegates. Additionally, the scientific committee has worked hard to create a cutting edge program led by experts in the fields of Obstetrics, Gynaecology, Musculoskeletal, Vascular, General, Cardiac and Point of Care. The variety of new scientific abstracts for oral and poster presentations complimented by a pre-conference fetal echo program will ensure the needs of all practitioners who use ultrasound in their clinical practice are met.

The Learning objectives include:

- To provide a forum to assess current state-of-the-art ultrasound imaging and its applications in non-invasive diagnosis.
- To compare the experience of international medical professionals in the optimum management of ultrasound use.
- To critically examine recent research studies into diagnostic ultrasound and their implications for clinical practice.
- To outline the recent scientific advances in the clinical practice of diagnostic ultrasound.

Australasian Society for Ultrasound in Medicine

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So join us in Sydney for the 45th Annual Scientific Meeting 11-13th September 2015. We look forward to welcoming you there! Learn more and register on **www.asumconference.com.au**

ASUM 2015

Australasian Society for Ultrasound in Medicine

AUSTRALASIAN SOCIETY FOR ULTRASOUND IN MEDICINE



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FRIDAY	SATURDAY	SUNDAY
Obstetrics & Gynaecology	Obstetrics & Gynaecology	Obstetrics & Gynaecology
MSK	MSK	MSK
Point of Care	Point of Care	Education/ Infection Control
General (Abdomen, Paediatrics & Small Parts)	General (Breast)	Cardiac
Midwives	Vascular	

International Keynote Speakers

Professor Tom Bourne
Queen Charlotte's and Chelsea Hospital, United Kingdom

Professor Christoph Lees
Imperial College London, United Kingdom

Professor Aris Papageorghiou
Oxford University, United Kingdom

Professor Thomas Fischer
Charite' Campus Mitte, Germany

Professor Frank Miele
Pegasus Lectures, USA

Cindy Rapp
Toshiba America Medical Systems, Canada

PRE-CONFERENCE INTERACTIVE PROGRAM
Doppler in Fetal Medicine
Obstetric Ultrasound
Thursday, 10 September 2015

FOR MORE INFORMATION: **www.asumconference.com.au**

Image is everything

In healthcare a good image can mean the difference between life and death. Now, with ultrasound gaining acceptance beyond the imaging department and credentialing becoming mandatory, getting that image right is more important than ever.

Yet despite the advantages that bedside ultrasound offers to patient management, are you questioning yourself when that probe is in your hand? Are you delaying treatment because you need the reassurance associated with traditional imaging modalities? Do you look back at the end of a shift and wonder if your equipment was correctly set, or whether you missed something?

Such issues are not unique to you – they are truly global. And just as the rate at which bedside ultrasound use is accelerating, accessing quality education to bridge the knowledge gap is becoming increasingly difficult. Demand for training positions is rapidly outpacing the limited capacity of traditional learning pathways. Consequently ultrasound education is often provided ad-hoc, with quality and consistency compromised by the competing pressure of operational realities.

We offer a no compromise solution to your ultrasound training needs

Ultrasound Training Solutions is an established leader in the education of medical and allied health practitioners. Our mission is to provide the highest quality ultrasound courses and credentialing support services available, applying innovative teaching techniques in a relaxed environment to ensure that learning is relevant and fun.

- **Limited numbers**
  Course numbers are strictly limited to meet accreditation standards, and provide an intensive practical training experience to meet your learning objectives, uninterrupted by work demands.

- **Expert faculty**
  Our faculty boasts consultant physicians from across the clinical spectrum, and sonographers with knowledge of the idiosyncrasies of point of care applications. All passionate practitioners, each has an unbeatable combination of theoretical expertise and practical experience that you can relate to, having confronted many of the issues you may face daily.

- **Research-led design**
  All courses address needs specific to particular clinical applications, identified through ongoing consultation with practitioners, past alumni from around the globe and literature. You will gain relevant and practical skills that can be used immediately at the point of care.

- **Innovative delivery**
  Our educators use a variety of teaching modes including short lectures, simulation, case studies and tactile modelling. Applying the best in adult learning theory, we keep classroom sessions short. Ultrasound is a practical skill, so we focus on the 'hands-on' – you won't find yourself sitting all morning as you might experience elsewhere. There is ample opportunity to practice your new skills on real patients – and ultrasound phantoms – to gain confidence in 'simulated' real world situations.

- **Fully catered**
  We believe that a medical army can only learn on good food; we fully cater to your needs at our 'Doppler Café'. Here you can take the opportunity to relax and socialise with other candidates and our faculty. This is where some of the best learning happens!

- **Destination Melbourne**
  Centrally located in one of Melbourne's prestige locations you have easy access to all key attractions that our city offers. Reduced accommodation rates are available.

We pride ourselves in advancing the use of ultrasound at the point of care, and guarantee that we will provide you with the skills to get that image right and be confident of your diagnosis. After all, in ultrasound, image is everything: let us improve yours.




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Introductory Ultrasound for Emergency Medicine
5 Day Course

27-31 July 2015
14-18 September 2015
19-23 October 2015
7-11 December 2015
18-22 January 2016
7-11 March 2016
18-22 April 2016
6-10 June 2016

Emergency Medicine Ultrasound Refresher
2 Day Course

5-6 August 2015
10-11 November 2015
24-25 February 2016

Advanced Emergency Medicine Ultrasound
3 Day Course

14-16 July 2015
14-16 October 2015
29 Feb - 2 March 2016
22-24 June 2016

Introductory Ultrasound for Pregnancy Assessment
4 Day Course

20-23 July 2015
31 Aug-3 Sept 2015
26-29 October 2015
01-04 December 2015
15-18 March 2016
9-12 May 2016

Advanced Obstetric Ultrasound
2 Day Course

10-11 August 2015

Ultrasound for Gynaecology
2 Day Course

12-13 August 2015
22-23 February 2016

Early Pregnancy Assessment for Nurses & Midwives
3 Day Course

7-9 September 2015
15-17 February 2016

Third Trimester Ultrasound for Nurses & Midwives
2 Day Course

24-25 August 2015
14-15 December 2015
2-3 May 2016

Ultrasound for Emergency Nurses
3 Day Course

26-28 April 2016

Follicle Ultrasound for Nurses
2 Day Course

15-16 February 2016

Essentials of Paediatric Ultrasound
3 Day Course

28-30 September 2015
18-20 May 2016

Ultrasound for Intensive Care
3 Day Course

18-20 November 2015

General Ultrasound for Intensive Care
2 Day Course

11-12 April 2016

Echo in Life Support
1 Day Course

7 August 2015
12 November 2015
26 February 2016

Goal Directed Basic Echo for Critical Care Physicians
3 Day Course

26-28 August 2015
4-6 November 2015
10-12 February 2016
13-15 April 2016

Ultrasound for General Medicine
3 Day Course

10-12 June 2015
7-9 October 2015
23-25 February 2016

Emergency Ultrasound for Rural & Remote Medicine
3 Day Course

17-19 July 2015
02-04 October 2015
27-29 November 2015
8-10 January 2016
4-6 March 2016
13-15 May 2016

Introductory Ultrasound for Anaesthetists
2 Day Course

10-11 July 2015
04-05 September 2015
13-14 November 2015
19-20 February 2016
6-7 May 2016

Introductory Musculoskeletal Ultrasound
2 Day Course

12-13 October 2015
2-3 May 2016

Vascular Access Ultrasound Workshop
1 Day Course

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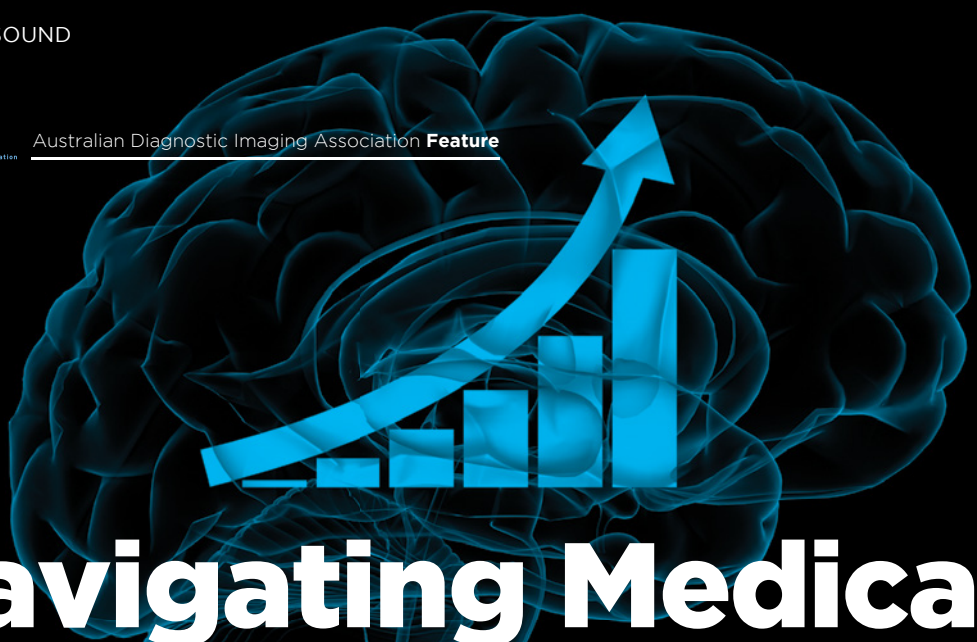

Navigating Medicare:

Understanding Restrictions on Access to Medicare Funded Diagnostic Imaging

For most Australians, healthcare is simply an occasional trip to the family doctor and perhaps an X-Ray or two – fully funded by Medicare, of course. However, for those Australians who suffer from serious and ongoing conditions, such as cancer and Alzheimer's disease, it is not nearly so simple.

Patients who require more intensive and complex medical services find themselves facing great uncertainty about the role of Medicare in the patient journey – this is particularly so with specialist services such as diagnostic imaging. Many patients are unaware of the limits and restrictions to Medicare services, which often leads to unexpected and significant out-of-pocket expenses when accessing diagnostic imaging services.

Focusing on two of diagnostic imaging's most restricted and expensive modalities - Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET) – we look at (i) the requirements patients must satisfy to be eligible for the Medicare rebate; and (ii) highlight some of the services that are not covered by Medicare.

MRI

General Restrictions

MRI is a popular modality due to its ability to create highly detailed images that aid in the diagnosis and treatment of a whole variety of conditions including cancer, multiple sclerosis and spinal injuries. Given its utility it is no surprise that surgeons will often refuse to operate without an MRI.

Funding for MRI under Medicare is very limited and the services that are funded involve a number of restrictions before patients are able to claim a Medicare rebate. There are four factors every patient should consider when they are referred by their doctor for an MRI:

- Not all MRI units attract Medicare funding. In fact, there are only 349 MRI licences provided by the Australian Government that attract Medicare funding nationwide. These licences can be either full or partial, meaning that some Medicare services will not be available on MRI units with a partial licence. This means that patients must ensure that their imaging is being conducted on a Medicare funded MRI unit in order to be eligible for a Medicare rebate;
- Medicare has a separate set of services for children under 16 years. This means that the eligibility of certain services will vary depending on whether a person is over or under 16 years of age;
- Patients will often encounter restrictions on how often they can access Medicare-funded services. For most services patients are only eligible for Medicare funding for 1-3 presentations in a 12 month period. If a patient requires more than the maximum number of presentations they will not receive further Medicare funding for those services until the 12 month period has elapsed;
- In order to be eligible for Medicare rebates for MRI, patients are generally required to have a referral from a specialist, not a general practitioner. If patients do not have the appropriate referral, Medicare will not subsidise or reimburse the cost of the examination, even if the service is provided by a Medicare-funded MRI unit.

What is not covered by Medicare?

Arthritis and Chronic Pain

MRI is valuable for early diagnosis and staging of Arthritis as it creates high resolution images showing cartilage integrity and degradation of bone in affected joints. It is also valuable in diagnosing the underlying causes of chronic pain, thereby preventing any further deterioration. While this modality is generally supported by Medicare, conditions such as tempero-mandibular disorder, which can be caused by Arthritis in the jaw joint, do not attract a Medicare rebate.

Cancer

MRI plays a major role in the patient journey for those who suffer from a wide range of cancers. This is due to its sensitivity in the detection of cancer, both primary and metastatic, and in monitoring the progression of various

cancers. Examinations for diagnosis and treatment are available for selected cancers under Medicare, however, there are a number that are either not fully funded or have high restrictions that compromise its utility. MRI examinations for prostate, ovarian and pancreatic cancers, for example, are not eligible for any Medicare funding. Similarly, Diffusion Weighted Imaging (DWIBS) for Leukaemia is also not eligible for Medicare funding.

While MRI scans for breast cancer are eligible for Medicare funding, the complex eligibility requirements severely limit accessibility to patients. The eligibility requirements are:

- A dedicated breast coil must be used;
- The request must identify that the person having the scan is asymptomatic and under 50 years of age; and
- The request must identify either that (i) the patient is at high risk of developing breast cancer due to a specific number of relatives being diagnosed with breast cancer; or (ii) that genetic testing has identified the presence of a high risk breast cancer gene mutation.

If a person does meet all of the relevant eligibility criteria they are entitled to a single Medicare funded service in a 12 month period.

PET

PET is a highly valued test that detects cancer before it can be found with other medical imaging techniques.

General Restrictions

Access to Medicare funded PET examinations is far more limited than MRI, with only 20 item numbers devoted to this particular modality. While it is often considered an expensive imaging modality, it is a highly valued test that can detect cancers before they can be identified with other modalities. It also allows doctors to provide patients with cost-effective treatment options and uniquely accurate updates on the progress of treatment. When patients are referred for a PET scan there are a number of factors that should be considered:

- PET units are only eligible for Medicare funding if they are provided by a comprehensive practice that provides a full range of diagnostic imaging and cancer treatment services at the one site;
- Only PET scans that use the 'standard FDG tracers' are eligible under Medicare. This means that many unique tracers that have been developed to diagnose specific conditions (such as the PSMA for prostate cancer) are not eligible for Medicare funding;
- As with MRI services, patients are required to have a referral from a specialist in order to be eligible for a Medicare-funded service. Referrals from a General Practitioner will not be sufficient to attract Medicare funding.

What is not covered by Medicare?

Arthritis and Chronic Pain

PET scans are valuable in the assessment of the systematic involvement of arthritis, the evaluation of the active areas of the disease and diagnosing the underlying causes for chronic pain. While PET scans do provide many benefits, there is no Medicare funding available for musculoskeletal scans for the assessment of inflammation associated with arthritis (rheumatoid arthritis). Given the lack of access to this modality, many patients are forced to rely on other diagnostic imaging modalities for diagnosis and treatment.

Alzheimer's Disease

PET scans are invaluable in the differentiation between frontotemporal dementia (FTD) and Alzheimer's disease based on physiological activity. Unfortunately, Medicare funding is not available for PET scans for all forms of dementia including Alzheimer's disease.

Heart Disease

There are a number of benefits stemming from PET for patients with heart disease. It is most valuable as a tool in cardiac disease assessment, however PET scans for cardiac assessment are not covered under Medicare, leaving many patients reliant on other modalities.

Diabetes

While the condition itself does not require diagnostic imaging services, conditions that stem from diabetes, such as osteomyelitis (the infection of the feet and long bones), will not attract a Medicare rebate if patients have access to more conventional Nuclear Medicine techniques such as ex-vivo WBC scanning.

Epilepsy

PET scans have a unique ability to show the brain's use of oxygen or sugar, providing valuable information that can be used to determine the origin of seizure activity. Funding for epilepsy examinations is limited to patients that are suspected of having refractory epilepsy or recurrent disease. Additionally, a patient's condition must be confirmed in order to be eligible to access Medicare funding.

Cancer

As with MRI services, PET scans are also quite limited for the diagnosis and monitoring of various cancers, only attracting funding for patients with residual, metastatic and recurrent disease. Cancers of the breast, bowel and ovaries attract this limited funding. Similarly, PET scans for Hodgkin's and Non-Hodgkin's Lymphoma patients are limited to patients with confirmed disease who are suspected of having a recurrent disease. Some cancers, such as breast and prostate cancer, do not attract any Medicare funding.

Tips for Patients

The Medicare system is complex and often leaves patients confused about which examinations and treatments attract Medicare funding, particularly when accessing diagnostic imaging services such as MRI and PET. However, it is important that patients know what questions to ask in order to ensure that they are fully prepared for the costs they may incur before undergoing the service. For patients who may require diagnostic imaging, MRI and PET in particular, it is important to ask the following questions:

- Is the service eligible for Medicare funding?
- Do I have the appropriate referral?
- Does the service attract an out-of-pocket cost?
- What payment options are available?

Given the importance of diagnostic imaging in the diagnosis and treatment of a wide range of conditions - and the potential out-of-pocket costs patients can incur when accessing these services - it is important that patients are able to make informed choices about their healthcare without encountering unexpected costs. Healthcare professionals can also play a pivotal role in educating patients about the role Medicare has to play in the diagnosis and treatment of their illness.

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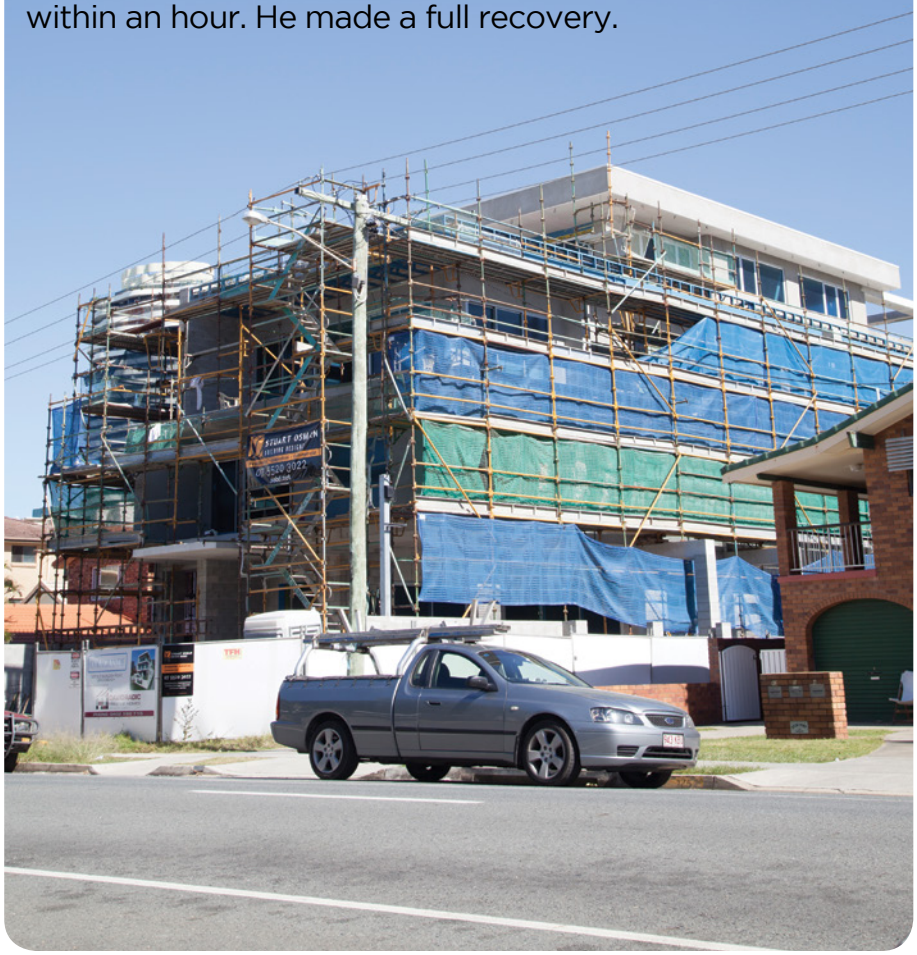

Ultrasound has become an increasingly intricate and critical part of Australia's Healthcare System. Every day patients Australia wide are experiencing the use of ultrasound in diagnosis and in effective treatment whether in an Emergency Department, Cardiac ward or with an injection using ultrasound guidance.

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involving the use of ultrasound which encompass challenging technical requirements and knowledge, can be achieved with a relatively simple step by step approach. Our aim is to carefully take in the current ability of the student whilst setting achievable goals for the duration of the course and beyond. The combination of well -developed programs with a focus on practical "hands- on" scanning using live models of varying body habitus creates a favourable solution to enable Doctors, Nurses and other Health Professionals to facilitate real improvements in patient management and outcomes.

At the AIU we acknowledge that everyone learns differently and not one style will suit all. We provide the environment to create correct learning in a positive forum allowing students to focus on developing technique and understanding to ultimately improve their knowledge and confidence in using ultrasound. Physicians, nurses, paramedics, etc from medical student to consultant, across all generations, looking to improving their image by connecting technique and knowledge to achieve a truly integrated approach to understanding an increasingly valuable skill.

Learning Environment

We endeavour to do our best to help you finish your course with a well-founded grounding in the basic techniques and to make sure that these techniques lay the foundation for a safe and effective ultrasound practice into the future- vision through sound. Having participated in a course at the AIU you will find yourself a part of "THE AIU COMMUNITY." We offer all registrants continuing post-course support in imaging review and advice.

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Our faculty is made up of experienced professionals ranging from trained Sonographer Tutors who have a wealth of knowledge in the Point of Care environment to Clinicians from a variety of medical backgrounds who are all highly trained in the use of Point of Care ultrasound in their specialty.

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Our courses are accredited widely across many professional colleges, societies and hospitals including but not limited to ASUM, RNZCOG, ACEM.

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ADIA australian diagnostic imaging association — Australian Diagnostic Imaging Association **Feature**

The Future of Medical Imaging

Medical imaging is consistently held to be one of the most important advances in the history of medicine[1], and has become an integral part of the diagnosis and treatment of patients around the globe. The New England Journal of Medicine identified imaging as one of the top 11 medical developments of the past 1000 years;[2] in 2010 the Fellows and Members of the Royal College of Physicians of Edinburgh ranked imaging third in the *Top 20 Most Important Medical Developments of the Last 50 Years.*[3] In Australia, the importance of medical imaging is demonstrated by the 3 million medical imaging services performed nationwide on non-admitted patients in public hospitals in 2012-13 alone [4], writes *Dr Chris Wriedt.*

In 2013, more than 600,000 Magnetic Resonance Imaging (MRI) examinations were performed in Australia, up over 50 per cent in 6 years;[5] there were over 2.5 million Computed Tomography (CT) examinations performed in 2013, up almost 50 per cent over the same period.[6] Ultrasonography examinations are equally as commonplace. While this level of growth is not always viewed favourably, it does demonstrate the high level of access to medical imaging that all Australians enjoy and can be regarded as a shift in the purpose of medicine from merely treating illness to employing methods that facilitate early intervention. Medical imaging has become the principal tool in early diagnosis - a process that saves lives and eases the strain on the Australian healthcare system.

It is becoming increasingly clear that the non-invasive methods which are used to see inside the human body have revolutionised medicine. Indeed, medical imaging techniques such as the MRI, CT, nuclear medicine, ultrasonography and diagnostic radiology are being utilised as diagnostic tools that not only assist radiologists in identifying the location and nature of diseases at the early stages but also play an integral role in identifying pathological abnormalities that determine treatment.

Given the importance of medical imaging in medicine, we take a look at some of the most important advances over the last 40 years and some of the new developments which provide an insight into the future of medical imaging.

Important Inventions in Medical Imaging

Computed Tomography

CT imaging (also referred to as CAT scanning) was invented in 1971 by Godfrey Hounsfield and Allan Cormack.[7] The technology uses x-rays to create cross sectional 'slices' of the body, which are then processed through a computer to provide a detailed image of the specific location of the scan. These images provide greater detail of internal organs, bones, soft tissue and blood vessels than traditional x-rays.

Today it is used widely throughout the world for scanning anything from heart disease to Alzheimer's. It has also been developed as an alternative to uncomfortable and painful procedures such as the colonoscopy.

Magnetic Resonance Imaging

The MRI was developed during the 1970's and its creation is attributed to a number of individuals including Raymond Damadian, Paul Lauterbur and Peter Mansfield. [8] An MRI works by the combining a strong magnetic field with radio waves resulting in the emission of energy signals which are processed and generated into a 3D image.

While it is one of the more expensive modes of medical imaging available, it does provide uniquely detailed scans and is considered to be more appropriate than a CT scan for patients who suffer from spinal cord injuries or brain tumours. An additional benefit of an MRI is that, unlike most imaging modalities, it involves no ionising radiation.

Positron Emission Tomography

Positron Emission Tomography (PET) scans are a form of nuclear medicine, a mode of medical imaging that involves the injection of radioactive substances in the diagnosis and treatment of various diseases. This modality differs from other forms of medical imaging because it records radiation emitting from within the human body rather than from an external source. The concept of emission and transmission tomography began with David E. Kohl, Luke Chapman and Roy Edwards in the late 1950's and was further developed by Michel Ter-Pogossian and Michael E Phelps.

In standard PET scans a radioactive tracer is introduced into the body and emits gamma rays or positrons that are processed through a sophisticated computer to produce a 3D image. While access to this procedure has previously been limited due to the prohibitive cost, it has become an integral part of cancer diagnosis and treatment monitoring.

The Future of Medical Imaging

There are many exciting, new imaging techniques that are continually being developed throughout the industry, and while it is often the case that new technologies take decades to perfect, the following developments provide an insight into the future of medical imaging.

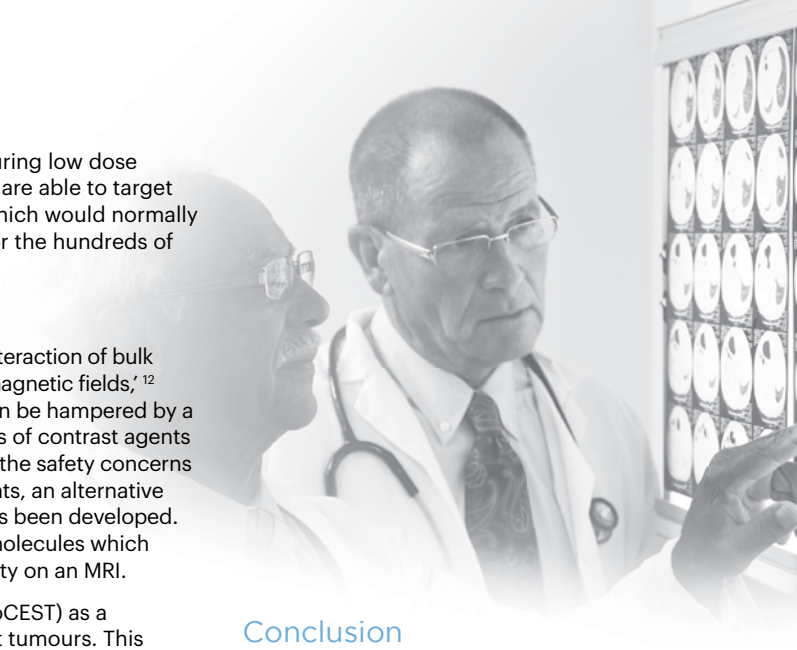
Phase-Contrast and Proton CT

Although the concept of phase-contrast imaging is not new, it has largely been confined to techniques that visualise cellular structures in live cells. The technique has not been transferred to x-ray phase-contrast imaging due a lack of compatibility with conventional x-rays tubes. However, the development of more advanced nanofabrication of gratings has resulted in techniques that are compatible with standard sources. This has removed a significant barrier to the use of phase-contrast imaging in the clinical sphere.

Unlike standard x-ray systems, which measure the attenuation of a beam through a biological sample in order to determine its structure, phase-contrast CT (PC-CT) focuses on variations in density which change the phase of the wavefront of an x-ray beam. These changes are then converted into an image.

As an alternative to x-rays, protons are being applied to existing imaging technologies, such as CT to create the proton CT scanner (pCT).[9] In 2010 Northern Illinois University, Loma Linda University (California) and the University of California collaborated to create a prototype pCT scanner and work is currently underway to create a pCT scanner that can produce 3D images in minutes.[10] PCT uses protons to document the location, direction and energy loss from a proton beam as it passes through the human body. This technique can be used to produce a 3D image of the body that assists in the diagnosis and treatment of a range of diseases.

Both PC-CT and pCT offer a number of benefits for patients, but perhaps the most notable is the active focus on developing CT technologies that use low dose radiation. PC-CT and pCT provide more detailed, better →



→ quality images and they are also designed with a view to ensuring low dose radiation examinations. In the case of pCT, for example, protons are able to target the object of the examination, safely bypassing healthy tissue which would normally be exposed to radiation.[11] These advancements make CT safer for the hundreds of thousands of Australians who rely diagnostic imaging each year.

Chemical Exchange Saturation Transfer

An MRI commonly relies on a radiologist's ability to 'measure the interaction of bulk water protons in the body with the external magnetic and electromagnetic fields,' [12] In order to adequately interpret images. However, this process can be hampered by a number of factors which ultimately leads to higher concentrations of contrast agents being used in order to obtain reliable images. In order to address the safety concerns associated with the use of higher concentrations of contrast agents, an alternative approach called chemical exchange saturation transfer (CEST) has been developed. The CEST contrast approach involves the selected saturation of molecules which can be detected through the water signal with enhanced sensitivity on an MRI.

CEST has also been combined with glucose (referred to as glucoCEST) as a radiation-free alternative to the PET scan which is used to detect tumours. This process labels glucose magnetically with radio waves so it can be detected with a standard MRI, producing images that can aid in the detection of tumours. This approach, once it has been refined, will have a profound impact on vulnerable patients, such as children and women during pregnancy, who cannot access PET scans because of the dangers associated with radiation exposure. Vital PET scans will now be performed without safety concerns, allowing radiologists to accurately diagnose and treat those patients who need it most.

Radio-Pharmaceutical Tracers

Medical Imaging is often used to detect tumours in the human body. Due to the high levels of glucose that tumours need, a form of glucose known as FDG is commonly used as a tracer in PET-CT to detect several varieties of tumours. However, there are a number of tumours (traditionally slow growth tumours), that do not use high amounts of glucose, leaving many patients unable to obtain that crucial early diagnosis or accurately track the progression of their illness. In order to overcome this disadvantage, a variety of PET tracers have been developed in order to specifically target the abnormal functions of particular tumours.

Prostate cancer is an excellent example. Prostate cancer is the most frequently diagnosed cancer in men, claiming over 3,000 lives in Australia each year. The early detection of prostate cancer is essential to a positive prognosis, but it is notoriously difficult to diagnose by traditional imaging methods. In order to overcome this obstacle a new tracer called *prostate specific antigen membrane* (PSMA) has been developed. PSMA is designed to target a protein on the membrane of prostate cancer cells which enables a PET-CT to detect the affected cells. The use of the PSMA for PET-CT has shown a great deal of promise, with increased accuracy in the detection of prostate cancer and surrounding areas such as the bones and lymph nodes. For the first time, men will be able to access reliable medical imaging for prostate cancer. These scans will not only assist in the early diagnosis of prostate cancer but will also mean that patients with suspected or confirmed prostate cancer will no longer have to undergo futile surgeries that can have serious consequences. PSMA enables men to take an active role in monitoring the onset of prostate cancer and gives clinicians a powerful tool with which to prevent and manage this illness.

PSMA is just one example of the benefits of targeted PET tracers, with others being developed for a variety of conditions such as musculoskeletal disease and head and neck cancers.

Conclusion

These advances demonstrate the growing importance of medical imaging in the patient journey. The medical profession is developing and using these technologies in order to ensure the best possible outcomes for patients. This can be done by providing access to medical imaging that: a) moves away from invasive procedures in favour of efficient, non-invasive services; b) focuses on the creation of better quality images to enhance the precision of diagnosis and treatment; and c) reduces radiation doses and utilises radiation-free methods to achieve reliable, high quality imaging results.

It is also important to remember that, while these new advances are significant, there is always a critical human element involved. The radiologist, and the critical role that they play in the patient journey, is essential. It is this marriage of man and machine that is saving lives every year and ensuring the best possible outcomes for patients who rely on medical imaging in the diagnosis and treatment of a myriad of conditions. In order to maintain an efficient, quality-driven health system it is essential to ensure Australians continue to have appropriate access to medical imaging and that our healthcare system supports the integral role of the radiologist in providing patients with the best possible clinical care.

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Remembering Those who Served and Cared

As we reflect on the Anzac centenary and the many events from the First World War that have shaped our present world, it is important to remember and reflect on the role nurses played alongside Australian soldiers. Australian nurses have served during wartime for over 100 years. Even now, the images associated with wartime are those of Australian soldiers charging up the slopes of Gallipoli, but rarely do you see or read depictions of the nurses who cared for the injured and dying. It wasn't until 1997, almost 80 years after the end of the First World War, that the Australian Government dedicated a site on Anzac Parade in Canberra, the Australian Service Nurses National Memorial - to commemorate the contribution of nurses in all theatres of war.

The ACN (Australian College of Nursing) is committed to remembering the service of Australian nurses during wartime and has partnered with Dr Ruth Rae in a commemorative publication - *The History of Australian Nurses in the First World War: An ACN Centenary Commemorative Trilogy.* The Trilogy details the important contribution of Australian nurses and, most notably, Australian nurse leaders who served in the First World War.

Even in the 19th century, nurses saw the need for strong nurse leadership and the necessity of a universal standard of nurse education. The Australasian Trained Nurses' Association (ATNA) was established in 1899, followed by the Australian Army Nursing Service (AANS) which was established in 1903 as part of the Australian Army Medical Corps. The AANS was a reserve unit comprised of nursing services from each former colony and consisted of entirely part-time, volunteer nurses – including pioneer Australian nurse leaders such as Matron Adelaide (Maud) Kellett, Matron Julia Ellen (Nellie) Gould, Matron Jessie McHardie White and Matron Rose Creal.

The first cohort of Australian nurses left Australia in September 1914 and over the course of the war served wherever Australian troops were stationed. Nurses - including pioneering Matrons Kellett, Gould, White and Creal - were recruited from the AANS reserve and the civil nursing profession. There were 2,468 Australian civilian nurses' who volunteered for active service during the First World War and more than 400 who served in Australia. Of those 41 individuals were lost during this time in the line of duty, and the past years have seen at least 388 decorated for their dedication and efforts to the First World War.

These nurses had to deal directly with both the physical and mental health concerns that affected those who served on the front-lines. Like our servicemen, many nurses travelled far from their homes with no real sense of what was ahead of them. They experienced the challenges of being out of their depth, away from home and inundated with injured and sick patients – as well as having to fight for recognition of their medical efforts.

One example of the extreme conditions nurses had to work in, were the experiences of the 300 AANS nurses who left Australia in late 1914 and arrived in Egypt early 1915. These nurses were posted to either the 1st Australian General Hospital (1 AGH) or the 2nd Australian General Hospital – both stationed in Cairo. With the influx of patients from Gallipoli in April 1915, the facilities became overcrowded and the equipment and supplies totally inadequate; the Australian nurses worked around the clock. Eventually 1 AGH took over a nearby amusement park, turned the ticket office into an operating theatre and the skating rink, scenic railway, and skeleton house into wards –illustrating quite remarkable ingenuity.

Although many of these nurses were working in unimaginable conditions, it was strong nurse leadership that ensured these First World War nurses, at least, had a reasonable level of training. In Veiled Lives, the third book in the Trilogy, Dr Rae discusses the persistence of Matron Jane Bell in gaining more training for her nurses: →

> Surgical trainee nurses were instructed in operating theatre procedures and became proficient in assisting surgeons during procedures as well as assisting the anaesthetist. This demonstrated a great deal of foresight on the part of Bell because these same operating theatre nurses were, in a few short years, assisting surgeons in CCS [Casualty Clearing Station] and in makeshift theatres on hospital ships, repairing the damaged bodies of soldiers who had just been wounded. Women who became nursing volunteers during the First World War were 'overwhelmed with nervousness and embarrassment' because 'thanks to the Victorian tradition which up to 1914 dictated that a young woman should know nothing of men but their faces and their clothes until marriage pitchforked her into an incompletely visualised and highly disconcerting intimacy'. Fortunately, this was averted for future army nurses who would have been ill-equipped to manage such a situation if Jane Bell had not persisted with her proposal.
> (Rae 2015a, pp64)

Even with the extra training provided, many nurses were unaware of the impact that the war would have on not only their patients' mental health but their own. Not only did Australian nurses have to deal with the impacts of seeing their countrymen and friends killed or wounded in the war, many had to deal with shell shock; the long term physical and mental effects of war. Dr Rae highlights this in Scarlet Poppies, the second book in the Trilogy.

> Staff Nurse Leila Brown found the only way to deal with shell shock was to exercise common sense and compassion. She found that when she 'did night duty in this ward ... men would fight their battles over again in their sleep. A man ... would suddenly jump from his bed and with a wild expression hiss between his teeth 'lie down you b------ fools or you'll be seen' and similar things. You had to be careful in getting him back to bed – he was in a fighting mood and would certainly give anyone a blow who interfered with him.' Many narratives detail the pain the nurses felt watching the physical manifestations of shell-shock in the young, otherwise, healthy, men. It is difficult to explain why some nurses were able to compartmentalise the atrocities perpetuated by war yet others suffered the full psychological weight of their experiences.
> (Rae 2015b, pp140-141)

As would have been the case for some servicemen, there were also moments of beauty –although these moments were often intertwined with horror. Matron Maud Kellett, when serving on the hospital ship *Gascon* in 1915, stated poignantly:

> ... The sunsets were most glorious ... even more beautiful than at Lemnos, in as much, as the last ray of the after glow disappeared, the whole side of the mountain facing us, began to shimmer with myriads of lights, from the dug-outs. Viewed from the deck of the "Gascon" by night, Anzac Cove was indeed a most picturesque sight, and one could hardly realise what a deadly inferno it was, until the guns began to talk.
> (Rae 2015b, p. 104)

"When thinking about the contribution and sacrifice our ancestors made to protect our country it is important to remember that Australian nurses were standing alongside the soldiers."

When thinking about the contribution and sacrifice our ancestors made to protect our country it is important to remember that Australian nurses were standing alongside the soldiers. The number of lives saved by Australian nurses can never be calculated and their contribution, though sometimes not always widely known or discussed, extends far beyond the frontline of the war.

ACN would like to acknowledge and thank Dr Ruth Rae for her assistance with this article.

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Australian College of Nursing

Qi Medical Gas Services

Preventative Maintenance. Compliance, safety, reliability and efficiency.

With over 60 years experience providing gas solutions and support, BOC's Qi Maintenance program's dedicated resources are backed by the technical expertse and professional standards that the hospital environment demands.

The development and maintenance of a hospital's medical gas system is Qi. Australian Standards (AS) and equipment manufacturer recommendations form BOC's benchmark for service. Our routine maintenance tasks are performed to BOC best operating practice which meet these requirements.

Depending on the design of your individual system, BOC can customise a program that includes 12 monthly service and maintenance of your hospital's medical gas reticulation system, including surgical tool control units, medical gas pendants, regulators, flow meters, compressors, vacuum plant and other medical gas related equipment.

BOC's preventative maintenance program is designed to operate efficiently and improve the life of your medical gas system. Creating a robust and reliable system avoids unplanned interruptions to supply, builds system confidence and contributes towards greater patient safety.

Maintenance plans are carried out by our skilled service technicians according to applicable standards and the manufacturers' servicing recommendations. The service of your equipment at regular intervals includes testing, maintenance repair, parts replacement and tuning.

With our broad Qi Medical Gas Services portfolio, BOC can help you meet the considerable challenges of compliance and safety in today's healthcare environment. At the same time, we provide balanced insight and flexible tools to improve control and coordination of medical gases throughout your facility.

Ask us how we can help you manage your servicing needs with a tailored servicing and repair plan for best practice preventative maintenance for:

- Gas manifolds
- Zone isolation boxes
- Breathing air testing
- Medical Gas Devices
- Medical gas alarms
- Medical gas outlets
- Air and vacuum plant

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Simulation proving a worthwhile experience

No classroom experience can fully prepare healthcare professionals for the first time they are confronted with a patient clinging to life.

The high pressure environment of many people working feverishly together to keep a patient alive cannot be simulated by reading a textbook.

This is where Edith Cowan University's Health Simulation Centre comes in.

Using a combination of high fidelity mannequins and trained actors, the centre can be configured to realistically replicate almost any situation doctors and nurses may encounter, from an operating theatre or hospital ward to a GP's office or residential care environment.

Centre Director Claire Langdon said the aim was to make the scenarios used in training as realistic as possible.

"The Centre specialises in human factors training, which focuses on communication and optimising the effectiveness of teamwork in a clinical setting," Professor Langdon said.

"We know that even the most highly trained professionals can make errors, particularly in high-stress emergency situations. By running realistic high fidelity simulations we can help each member of the team learn how to identify any errors to reduce their occurrence in real world situations."

Professor Langdon said the feedback received from people who did the training was overwhelmingly positive.

"We have had even very experienced healthcare professionals come out of the training saying things like 'wow, that felt incredibly realistic," Professor Langdon said.

ECU recently acquired an inflatable tent that enables health simulation programs to be offered in rural and regional WA communities that don't have simulation facilities.

The tent can be inflated in just two minutes and can be used to train health students and professionals for scenarios including oil rig explosions, train derailments and toxic chemical fires.

For the past four years ECU's Health Simulation Centre has been delivering training for the WA Department of Health.

Run in conjunction with the Australia & New Zealand College of Anaesthetists and the Australasian College of Emergency Medicine, the training is run for anaesthetists, emergency physicians and other health professionals working in WA hospitals.

AUSTRALIA ECU EDITH COWAN UNIVERSITY

» Visit **ecu.edu.au/simulation** for more information about the courses offered at the ECU Health Simulation Centre.

Ever considered a "C" Change?

Why not make it a "Double C" career and become part of a healthcare team as a Clinical Coder!

Perhaps you are a nurse who is interested in more family friendly hours? An allied health professional who just wouldn't mind a break from patient-contact? An admin or finance clerk who'd like to make more of a difference, but not on the front line? Perhaps this is the career change for you.

Clinical Coders work 'behind the scenes', using an international health classification system to translate information from the clinical record into data vital to the quality delivery of the health system - funding, research and health care planning all depend upon it.

Clinical Coding is in increasing demand as an occupation and it's one the Health Information Management Association of Australia (HIMAA) has been working hard to support. Delivering education and training in clinical coding for over 20 years, HIMAA is currently the nation's largest provider.

A national Registered Training Organisation (RTO), we offer a foundation course in Comprehensive Medical Terminology (CMT) which, as well as entry requirement for our coding courses, is useful for medical receptionists, health fund administrators, pharmacy assistants and IT personnel interested in moving into the health industry. Our Clinical Coding courses at Introductory, Intermediate and Advanced levels are all Units of Competency eligible for a Certificate IV in Health Administration. For the fleet of mind, HIMAA also offers its Accelerated Program, fast track for fast learners who wish to complete CMT and Introductory Clinical Coding in just 12 months.

All our courses are delivered online so you can complete them at your own pace. Our Education Officers are HIM-trained educators specialising in coding who offer a personalised service throughout the course, providing advice and guidance as and when it is needed.

If you want to make a difference, make it with HIMAA! Don't miss out on the next intake!

»
Call our Education Services on **02 9887 5898** or email **education@himaa.org.au.** For general course information and other 2014/2015 intakes go to **http://himaa2.org.au/education**

KNOW SOMEONE CONSIDERING A "C" CHANGE?

Help them make it a "double C" with a career of a Clinical Coder.
Here is their opportunity to become part of a healthcare team without the front line clinical contact.
Catch the next intake!

The Health Information Management Association of Australia has delivered industry-standard distance education in Comprehensive Medical Terminology and Clinical Coding for more than 20 years.

HIMAA Education Services - Enrolment Calendar

Intakes open on the 1st and close on the 22nd of each month

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Comprehensive Medical Terminology			■		■		■		■
Introductory Clinical Coding			■				■		
Intermediate Clinical Coding					■			■	
Advanced Clinical Coding					■			■	
Refresher Clinical Coding	■					■			
Accelerated Program	■						■		

RTO ID: 91660

Our Education Officers offer a **personalised service** throughout the course, providing advice and guidance when needed.

Please visit our website www.himaa2.org.au under the education tab to read more about the Clinical Coder pathway or visit www.himaa2.org.au/education for courses details.
Call our Education Services on 02 9887 5898 or email education@himaa.org.au

Intensive Care: Decision-Making for the Critically Ill

"The success of intensive care is not, therefore, to be measured only by the statistics of survival, as though each death were a medical failure. It is to be measured by the quality of lives preserved or restored; and by the quality of the dying of those in whose interest it is to die; and by the quality of human relationships involved in each death."

– G.R Dunstan, [1] University of London, 1984

"When and how does an intensive care doctor stop treatment on a critically ill patient who they do in not think is going to survive?" "How should medical teams manage situations where the family and the treating team have different expectations about what is realistic or achievable in a critically ill patient?" "What is in the patient's best interests when there is uncertainty about the medical outcome?"

These are the sorts of questions that intensive care clinicians face every day in every ICU in Australia and New Zealand. Knowing the variation in practice, the stress that intensive care clinicians and families experience in managing care and decision-making at the end of life, the Australian and New Zealand Intensive Care Society (ANZICS) decided to undertake a major review of a guiding documents previously known as the "ANZICS Statement on Withholding and Withdrawing Treatment", first written in 2003. As the leading advocate on all intensive care related matters, ANZICS had the interest, the imprimatur and the expertise to prepare such a statement which was published in October 2014 (ANZICS Statement on Care and Decision-Making at the End of Life for the Critically Ill). Although preliminary work was commenced by a small group of intensivists in 2010 and 2011, in 2012 the ANZICS Board asked the ANZICS Death and Organ Donation Committee (DODC) to form a subcommittee. The ANZICS End of Life Care Working

A/Prof. William Silvester

Chair, ANZICS Death & Organ Donation Committee

Assoc/Prof William Silvester is Director, Respecting Patient Choices Program, an ICU specialist; a medical consultant for DonateLife Victoria, President of the International Society of Advance Care Planning and End-of-Life Care, Chair of the ANZICS Death & Organ Donation Committee and End-of-Life Care Working Group, Chair of the Royal Australasian College of Physicians End-of-Life Working Party and Chair of the Commonwealth $15M Decision Assist Project delivering advance care planning and palliative care to aged care and GPs nationally.

Group prepared a document which reflected and supported current practice in the care of critically ill patients at the end of life in Australia and New Zealand.

During the consultation period in 2014, the draft statement received broad support from ANZICS members and external groups including learned colleges and the Australian Commission for Safety and Quality in Health Care. It provides considerable detail on the relevant ethical principles and the legal framework and it delivers practical guidance on advance care planning, consensus building, communication and language, managing conflict and the delivery of palliative care in the ICU. Apart from general advice on good clinical practice, there is specific advice pertaining to the care of infants and children, along with consideration of a number of other special circumstances. Clinical case examples are used throughout to illustrate important points and to stimulate consideration and discussion.

The Statement has been written at a time of major change in medical practice. Although many medical advances have improved survival, this has been accompanied by a growing population of patients with chronic debilitating disease where such medical advances have limited benefits but carry significant burdens and distress. Recognising our mortality, the importance of a good death and aligning medical treatments with the wishes of the patient regarding an acceptable outcome, are increasingly important priorities for the public and health professionals.

The guidance provided is based around 10 principles of care and decision-making at the end of life for the critically ill. The principles are quoted below, accompanied by short commentary.

1. *"The goals of intensive care are to return patients to a quality of survival that is acceptable to them and to reduce disability and, if these are not possible, to compassionately support the dying process. At all times the aim is to minimise suffering. "*

These goals align with good medical practice, espoused by the Medical Board of Australia, the Australian Medical Council and the Medical Council of New Zealand. These codes reflect caring for and respecting patients, working in partnership with colleagues, patients and their family, acting honestly and ethically to deliver high standards of care.

2. *"Intensive care treatment is often lifesaving for patients with reversible critical illness. As predicting survival of an individual critically ill patient is imprecise, however, all patients should receive simultaneous attention to both therapeutic (and potentially burdensome) medical interventions and to ensuring their comfort and controlling distressing symptoms. The balance of attention may shift between these objectives during the patient's critical illness, including the possibility that the only objective may be patient comfort and symptom control."*

Admission to intensive care is usually reserved for patients with reversible disease whose outcome may be improved by the technology and human resources available in ICUs. Other reasons for ICU admission may include a time-limited trial of ICU treatment when the degree of reversibility is unknown, difficult symptom management (including palliative care), addressing family issues and consideration of organ donation.

Is the likely outcome acceptable to the patient? When do the burdens of treatment begin to outweigh the benefits? The answers to such questions must involve the patient and the family.

Discussion should include what are achievable goals and time limits and if and when to acknowledge the patient is dying.

3. *"When a decision has been made that active treatment is to be withheld or withdrawn, a palliative care plan should be implemented, in consultation with the patient and/or family and the ICU nurse, with a focus on dignity and comfort, considering physical, psychosocial and spiritual needs. The use of medication for patient symptom control in this setting is ethically and legally appropriate, even though this may shorten life."* →

→ Dying is individual for every patient and family. The palliative care plan, therefore, should be tailored to the needs of each patient and family, including emotional and practical support for the patient (if conscious) and the family, including children and is best delivered by a team: doctors, nurses, social workers, pastoral or spiritual leaders.

It is ideal to anticipate distress caused by withdrawal of respiratory support by pre-emptively administering sedation and analgesia and considering the staged removal of respiratory support. Given that some patients may survive despite the withholding or withdrawing of treatment, medication should be only administered with the intent of relieving distress, not hastening death.

4. *"There is no ethical or legal obligation to provide treatments where considered medical opinion is that the burdens to the patient outweigh any potential benefits. The substitute decision-maker does not have the right to demand treatment (except in Queensland). Medical consensus should be achieved between the intensive care and other medical teams before changing the goals of treatment."*

Withholding and withdrawal of life-sustaining treatment is considered lawful and ethically appropriate where there is a valid refusal by the patient or where it is in the patient's best interests. The only exception to this is Queensland where consent must be obtained from the substitute decision-maker.

5. *"The adult patient who has the capacity to decide is entitled to refuse or withdraw consent for any treatment at any time, even if this may shorten his or her life. "*

The law that relates to end-of-life care (as for other areas of medical practice) tends to emphasise the principle of autonomy. Autonomy is important given that the patient's perception of their best interests may differ from that of their healthcare professionals. Patients will not always want treatment that health professionals believe is in their best interests. A patient with the capacity to decide, however, has the right to choose from, or refuse, the treatments that are on offer, even if that refusal places their lives in jeopardy.

6. *"Medical staff and their patients should aim to make a shared decision about treatment options. The process of shared decision-making involves a consensus among the patient (if the patient has the capacity to make decisions), a substitute decision maker or family (if the patient does not have the capacity to decide), the intensive care team and other medical teams involved. Under shared decision-making, the responsibilities of the parties involved are as follows. It is the responsibility of the intensivist to:*

- Determine what treatment options are clinically indicated
- Determine the existence of an Advance Care Plan or Advance Care Directive if present
- Inform the patient (or substitute decision-maker in the case of a patient who lacks capacity) of the nature (including potential burdens and benefits) of these options and to provide professional recommendations about these options.

It is the responsibility of the patient with capacity to:

- *Inform the intensivist of what further information they require about the treatment options available in order to be involved in the decision-making.*

It is the responsibility of the substitute decision-maker of the patient who lacks capacity to:

- *Inform the intensivist of the patient's (and their own) goals, values and preferences that will inform decision-making.*

It is a shared responsibility of the intensivist, patient or substitute decision-maker to:

- *Use their shared understanding of the patient's goals, values and preferences, as well as the potential burdens and benefits of the clinically indicated treatment options, to make a decision about what treatments should take place. The goal is to reach a shared decision that reflects the best understanding of the patient's prognosis and of the patient's wishes in the current clinical circumstances."*

A patient's best interests are best served by considering the ethical principles of beneficence (act to benefit the patient), non-maleficence (avoid harming the patient) and autonomy (the patient's right to know and to make decisions about their own healthcare), cognisant of the patient's wishes, values and goals, given the clinical circumstance.

Intensivists have the knowledge of the patient's illness, of what is potentially achievable with treatment, and of the burdens of the illness and the treatment options. In considering what is in the patient's best interests they should take account of the patient's previously expressed wishes (including an advance care directive), the views of the legal substitute decision-maker(s) and the family. If time-critical decisions are required and the patient's best interests are not known, it may be appropriate to institute life-prolonging treatment until the required information is available.

7. *In cases when there is disagreement that cannot be resolved with discussion and time, consideration may be given to involving additional medical opinion, non-medical professional opinion (elders, clerics or spiritual advisers), clinical ethics consultation or legal processes.*

Disagreement is best pre-empted by achieving consensus - an opinion or decision reached by a group as a whole, where that decision can be supported by all members of the group even if it is not the most preferred opinion or position of each individual. A decision reached through the consensus of all interested parties is more likely to be a well-considered and appropriate decision and less likely to be subject to complaints or legal review. Consensus about the appropriateness of treatment should be achieved between the ICU team and other medical teams before it is sought with the patient, family and substitute decision-makers.

8. All decisions regarding the withdrawing or withholding of treatment should be documented in the clinical record. The documentation should include the basis for the decision, identify those with whom it has been agreed and specify the treatments to be withheld or withdrawn.

9. *The principles set out above apply equally whether withholding or withdrawing treatment is being considered.*

10. *Every intensive care unit (ICU) and its hospital should develop and implement guidelines in accordance with these principles. This should include the evaluation of care at the end of life as a quality measure.*

The ANZICS Statement on Care and Decision-Making at the End of Life for the Critically Ill is intended to provide a framework for best practice in respect of the care of critically ill patients at the end of life in Australia and New Zealand and to provide strong support to intensive care staff involved in the care of these patients and their families. The Statement is published electronically on the ANZICS website in order to facilitate keeping the Statement up to date (www.anzics.com.au). ANZICS continues to actively seek ways to further publicise the Statement. It has featured in numerous podcasts and been sent to the health departments in each Australian state and territory.

Do physiological crystalloids deliver optimal clinical outcomes?

What's the problem with using an intravenous solution with a high chloride load?

Normal saline (0.9% Sodium Chloride) has a chloride level (154 mmol/L) well above normal human serum levels (98–106 mmol/L).[1] Studies have consistently shown that moderate-to-large-volume infusions of 0.9% Sodium Chloride are associated with hyperchloraemic acidosis.[2–10] A salt excess does not accompany infusions of 'balanced' (i.e. physiological) crystalloids, as these products (e.g. Hartmann's and Plasma-Lyte 148) have sodium and chloride levels similar to plasma.[11,12]

But is hyperchloraemic acidosis clinically relevant?

A recent study of 22,851 surgical patients with normal preoperative serum chloride concentration and renal function demonstrated a 22% incidence of acute postoperative hyperchloraemia.[13] Of the 4955 patients with hyperchloraemia after surgery, 4266 (85%) patients were propensity-matched with an equal number of patients who had normochloraemia postoperatively. Patients with hyperchloraemia were at increased risk of 30-day postoperative mortality (3.0 vs 1.9%; odds ratio 1.58 [95% CI 1.25–1.98]) and had a longer median hospital stay (7.0 days [interquartile range 4.1–12.3] vs 6.3 days [interquartile range 4.0–11.3], $p < 0.01$) than those with normal postoperative serum chloride concentrations.[13] Patients with postoperative hyperchloraemia were also more likely to have postoperative renal dysfunction as defined by a 425 decrease in GFR (12.9 vs 9.2%, $P < 0.01$).[13]

What's the evidence that balanced crystalloids lead to superior patient outcomes when compared to 0.9% Sodium Chloride?

A retrospective observational study evaluated adult patients undergoing major abdominal surgery who received either 0.9% Sodium Chloride (n = 30,994) or a calcium-free, balanced crystalloid solution [Plasma-Lyte]; n = 926) on the day of surgery and found that Plasma-Lyte was associated with less post operative morbidity.[14] Postoperative infection ($p = 0.006$), renal failure requiring dialysis ($p < 0.001$), blood transfusion ($p < 0.001$), electrolyte disturbance ($p = 0.046$), acidosis investigation ($p < 0.001$) and intervention ($p = 0.02$), were all more frequent in patients receiving 0.9% Sodium Chloride.[14] This study also showed the in-hospital mortality rate to be significantly lower in the Plasma-Lyte arm compared to the group receiving 0.9% Sodium Chloride (2.9 vs 5.6%; $p < 0.0001$).[14]

While there are no large randomised trials comparing 0.9% Sodium Chloride with balanced crystalloids, a strong signal is emerging from double-blinded trials[15–17] and large observational studies[13,14,18,19] that the high chloride content in 0.9% Sodium Chloride leads to numerous adverse pathophysiological effects (see Box 1) – and hence, worse patient outcomes.[20] These include an increased incidence of acute kidney injury (and need for renal replacement therapy) and pathological hyperchloraemia, which may increase postoperative mortality.[20] These same effects are not observed with balanced crystalloids.[20] A thorough review of the evidence cited here can be found in Lobo and Awad, 2014.[20]

Box 1. Adverse events related to intravenous therapy with 0.9% Sodium Chloride when compared with balanced crystalloids

Metabolic	• Hyperchloraemic acidosis • ↑ Need for buffers to correct acidosis
Body water	• Possible damage to endothelial glycocalyx • ↑ Intestinal fluid volume leading to oedema
Renal	• Renal oedema and capsular stretch leading to intrarenal tissue hypertension • Renal vasoconstriction, ↓ renal blood flow and renal tissue perfusion • ↓ Glomerular filtration rate, urine volume and sodium excretion
Gastrointestinal	• Gastrointestinal oedema, intestinal stretch • Illeus, impaired anastomotic healing
Haematological	• ↑ Intraoperative blood loss • ↑ Need for blood product transfusion
Clinical outcomes	• ↑ Post-operative complications • ↑ Mortality • ↑Incidence of acute kidney injury and need for renal replacement surgery

Evidence collected from animal studies, healthy volunteers, small-randomised clinical trials and large patient cohort studies, and thus cannot be regarded as Grade A. Adapted from Lobo and Awad, 2014 (see paper for full evidence review).

How do the physiological profiles of commonly used crystalloids differ?[1,11–12,22–23]

	mmol/L								Tonicity*
	Cations				Anions				
	Na^+	K^+	Ca^{++}	Mg^{++}	Cl^-	Acetate	Lactate	Gluconate	
0.9% SODIUM CHLORIDE	154	-	-	-	154	-	-	-	Isotonic
HARTMANN'S	131	5.0	2.0	-	111	-	29	-	Isotonic
LACTATED RINGERS	130	4.0	1.5	-	109	-	28	-	Isotonic
PLASMA-LYTE 148	140	5.0	0	1.5	98	27	-	23	Isotonic
PLASMA	136–145	3.5–5.0	2.2–2.6	0.8–1.2	98–106	Bicarbonate 21–30			Isotonic

No calcium
Compatible with blood

Physiological levels of sodium and chloride

Dual bicarbonate precursors: acetate and gluconate

Physiological osmolarity

0.9% Sodium Chloride, Hartmann's, Lactated Ringers and Plasma-Lyte 148 differ in both the type and amount of electrolytes they contain. Unlike 0.9% Sodium Chloride, Hartmann's, Lactated Ringers and Plasma-Lyte 148 are multiple electrolyte solutions with one or more bicarbonate precursors.[11,12] It can be seen from the figure to the left that Plasma-Lyte 148's physiological profile is closest to that of normal human plasma. It also does not contain calcium and, therefore, can be administered before, during or after blood administration.[4,12,21]

References **1**. Baxter Healthcare Pty Ltd. 0.9% Sodium Chloride Australian Approved Product Information 22 October 2013. **2**. Reid F *et al*. *Clin Sci (Lond)* 2003;104(1):17–24. **3**. Chowdhury AH *et al*. *Ann Surg* 2012;256(1):18–24. **4**. Lobo DN *et al*. *Crit Care Med* 2010;38(2):464–70. **5**. Williams EL *et al*. *Anesth Analg* 1999;88(5):999–1003. **6**. Lobo DN *et al*. *Clin Sci (Lond)* 2001;101(2);173–79. **7**. Veech RL. Am *J Clin Nutr* 1986;44(4):519–51. **8**. Scheingraber S *et al*. *Anesthesiology* 1999;90(5):1265–70. **9**. Ho AM *et al*. *J Trauma* 2001;51(1):173–77. **10**. Wilkes NJ *et al*. *Anesth Analg* 2001;93(4):811–16. **11**. Baxter Healthcare Pty Ltd. Compound Sodium Lactate (Hartmann's) Australian Approved Product Information 11 March 2014. **12**. Baxter Healthcare Pty Ltd. Plasma-Lyte Australian Approved Product Information, September 2013. **13**. McCluskey SA *et al*. *Anesth Analg* 2013;117(2):412–21. **14**. Shaw AD *et al*. *Ann Surg* 2012;255(5):821–9. **15**. Waters JH *et al*. *Anesth Analg* 2001;93(4):817–22. **16**. O'Malley CM *et al*. *Anesth Analg* 2005;100(5):1518–24. **17**. Young JB *et al*. *Ann Surg* 2014;259(2):255–62. **18**. Yunos NM *et al*. *JAMA* 2012;308(15):1566–72. **19**. Yunos NM *et al*. *Crit Care Med* 2011;39(11):2419–24. **20**. Lobo DN and Awad S. *Kidney Int* 2014; doi: 10.1038/ki.2014.105 (epub ahead of print). **21**. Australian and New Zealand Society of Blood Transfusion Ltd., Royal College of Nursing Australia. Guidelines for the administration of blood products. 2nd edition, 2011. **22**. Powell-Tuck J, Grosling P, Lobo DL, et al. British Consensus Guidelines on Intravenous Fluid Therapy for Adult Surgical patients (GIFTASUP) March 2011. **23**. Kratz A, Ferraro M, Sluss PM, Lewandrowski KB. N Engl J Med. 2004;351:1548–63.

The elephant in the room

Is it time to include Plasma-Lyte™ in your fluid management practices?

Plasma-Lyte 148 ™

(Multiple Electrolyte Injection)

Designed to maintain *optimal* fluid and electrolyte balance[1,2]

References 1. Baxter Plasma-Lyte 148 Product Information. Date of most recent amendment, July 2014. **2**. Powell-Tuck J, Gosling P, Lobo DL *et al*. British Consensus Guidelines on Intravenous Fluid Therapy for Adult Surgical Patients (GIFTASUP). March 2011.

PBS Information: This product is listed on the PBS as a IV infusion for electrolyte replacement.

Please review Product Information before prescribing. Product Information is available from Baxter Medical Information onecall@baxter.com

Name of the Medicine: Plasma-Lyte 148 Replacement IV Infusion (Multiple Electrolyte Injection). **Indications**: Plasma-Lyte 148 Replacement IV Infusion is indicated as a source of water and electrolytes or as an alkalinising agent. **Contraindications**: None known. **Precautions**: Plasma-Lyte 148 Replacement IV Infusion should be used with great care, if at all, in patients with congestive heart failure, severe renal insufficiency, and in clinical states in which there exists oedema with sodium retention. Plasma-Lyte 148 Replacement IV Infusion should be used with caution, if at all, in patients with hyperkalaemia, severe renal failure, and in conditions where potassium retention is present. ***Interactions with other Medicines***: Caution must be exercised in the administration of Plasma-Lyte 148 Replacement IV Infusion to patients receiving corticosteroids or corticotropin. **Drug/Laboratory Test Interactions**: There have been reports of positive test results using the Bio Rad Laboratories Platella *Aspergillus* EIA test in patients receiving Baxter gluconate containing Plasma-Lyte solutions. These patients were subsequently found to be free of *Aspergillus* infection. Therefore, positive test results for this test in patients receiving Baxter gluconate containing Plasma-Lyte solutions should be interpreted cautiously by other diagnostic methods. **Adverse Effects**: Reactions that may occur because of the solution or the technique of administration include febrile response or infection at the site of infusion. Other reactions that may occur include: Circulatory effects: Extravasation, Hypervolaemia, Venous thrombosis, Phlebitis extending from the site of injection. If an adverse reaction does occur, discontinue the infusion, evaluate the patient, institute appropriate therapeutic countermeasures, and save the remainder of the fluid for examination if deemed necessary. **Dosage and Administration**: ***Dosage***: As directed by the physician. Each Viaflex container is for single patient use only and intended for intravenous administration using sterile equipment. ***Directions for use***: **Warning**: Do not use plastic containers in series connections. Such use could result in air embolism due to residual air being drawn from the primary container before administration of the fluid from the secondary container is complete. Do not administer unless solution is clear and seal is intact. **Preparation for Administration**: 1. Suspend container from eyelet support. 2. Remove plastic protector from outlet port at bottom of container. 3. Attach administration set. Refer to complete directions accompanying set. **Date of Approval**: Approved by the TGA: 01/12/2005. Date of the most recent amendment: 17 July 2014.

Baxter

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Date of preparation February 2015 Wellmark BHE24857
Material reference number: ANZ/64/14-0004

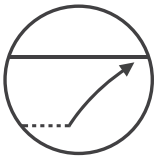
Individually responsive with Intelligent Air

Lumis introduces IntelligentAir: a collection of ResMed technologies – iVAPS, iBR, AutoEPAP, Vsync, TiControl™, and Trigger and cycle – that can tailor therapy to individual breathing needs. Automatically adapting to changes during the night and at different stages of a patients' condition, IntelligentAir makes personalised ventilation possible.

iVAPS

Intelligent Volume-Assured Pressure Support (iVAPS): maintains ventilation target*

To deliver the right volume of air for each patient's therapy needs, iVAPS intelligently learns their unique alveolar ventilation, sets appropriate targets, then provides smooth pressure support to suit.



iBR

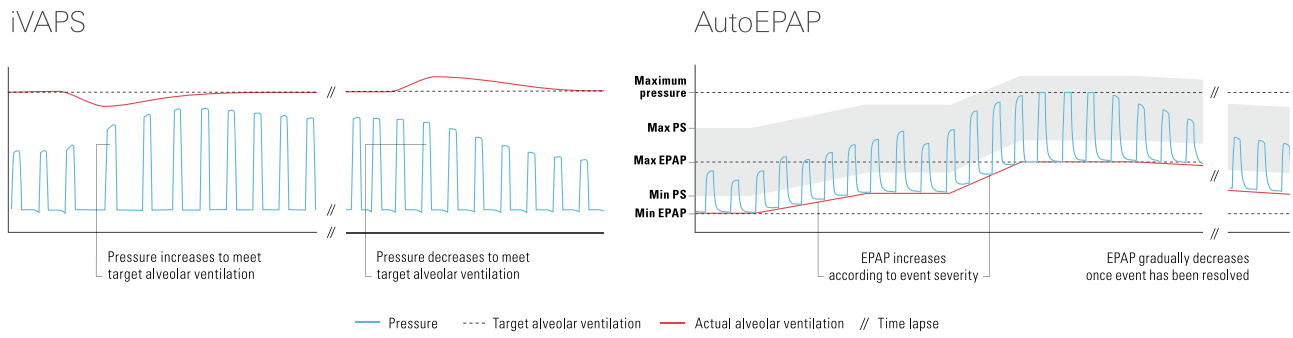
Intelligent Backup Rate (iBR): allows spontaneous breathing

To give patients maximum opportunity to spontaneously trigger the ventilator, iBR stays out of the way until needed. It then provides backup breaths to comfortably bring patients back to their target rate. (iBR is available in iVAPS and ST modes).

AutoEPAP

AutoEPAP: addresses obstructions and maintains upper airway patency

Responding according to the severity of the event, AitoEPAP auto-adjusts the expiratory pressure in response to partial and full obstructions. It also works to prevent events from occurring throught the night. (AutoEPAP is available in iVAPS mode).



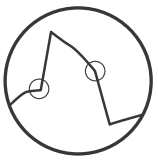
iVAPS with iBR and AutoEPAP continuously monitor ventilation and the upper airway, and automatically adjust the therapy delivered to simplify titration and treat patients with challenging conditions. With major therapy parameters set, you can then easily fine-tune settings on a 'per patient' basis, so that the ventilation delivered is truly personalised for efficacy and comfort.

Vsync

Provide excellent patient ventilator synchrony, even in the presence of significant leak

TiControl

Set min and max limits on either side of the patient's ideal inspiratory time to encourage spontaneous breathing.



5 Trigger

Optimise settings according to the patient's condition, using five trigger and cycle sensitivity levels.

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Helping People to Live with Dignity Until they Die

Many people spend their lives dreading ill-health and death. As the healthcare system evolves, it is important to prioritise dignity in healthcare at all times, particularly in end-of-life care.

The ACN (Australian College of Nursing) is committed to promoting the welfare of nurses and patients in the Australian health care system. Maintaining the dignity of patients is not only beneficial to those patients but also to the nurses and families who care for them. ACN actively advocates for the increased understanding and prioritisation of end-of-life care, in all health settings.

ACN has made submissions to a number of draft reports and consultation papers regarding palliative care in the Australian healthcare system; strongly advocating for the improvement of end-of-life care and an increase in patient-centred focus. To ensure safe, high quality end-of-life care, the delivery of care must be patient and family centred and provided by a well-supported interdisciplinary team.

It is important to recognise that the effectiveness of the essential elements of care within hospital and community-based systems are highly dependent on the role and presence of nurses. Quality nursing, especially during end-of-life care, can profoundly impact a person's quality of life, comfort and dignity and can have a long-term impact on their families and carers.

Systems to support high quality care must include nursing services with the capability and capacity to effectively deliver patient-centred care. Nurses, and other health care professionals, need to be responsive to the often changing and unexpected needs of patients; furthermore, healthcare professionals need to listen to patients and be receptive to the message they are sending. Care plans should be developed in consultation with the patient and their families and carers, and referred to regularly to make sure the patient's wishes are being adhered to.

As a passenger in a system you have limited control of, it can often be said that dignity is usually the first casualty. The Australian healthcare system must begin to work towards a system which places the patient and their dignity first. When encountering a patient suffering from a fatal illness, their comfort and self-worth should be a priority.

High quality care places an emphasis on each individual and their unique care needs. However, maintaining the dignity of patients goes further than responding to their physical care needs. Care providers must be able to see the people they provide care to as a person rather than the illness that they have.

"The ethical essence of nursing is the provision of care in response to the vulnerability of a human being in order to maintain, protect and promote his or her dignity as much as possible" (Gastman 2013). While the preservation of patient dignity is an ethical imperative for nurses, care provision and caring about patients are not always synonymous. Chochinov (2013) explains that whilst caring implies the conveying of fundamental qualities of kindness, compassion and respect to patients; all too often patients experience healthcare differently, with a trumping of personhood by patient-hood. In this he refers to the 'consequences of a medical system organised around care, rather than caring' and that despite technical competence, caring is often lacking or subordinated. Within this system, it can be difficult for nurses to reconcile this distinction between the provision of care, and caring. Nonetheless, it is clear that technical competence alone is not sufficient and emotional intelligence must be embodied in nursing care.

In their review of the literature, Lin et al. (2012) found that, from the combined nurse and patient perspectives, dignity in care within hospital settings was influenced by a number of factors. These included the physical environment, staff attitude and behaviour, organisational culture, and patient independence. Consideration of these factors is important if nurses, as clinicians and policy makers, are to truly promote dignity in care.

The need for patient dignity is especially important as people approach their end-of-life. In the hospice and palliative care literature, this has been addressed by "dignity-conserving end-of-life care" (Chochinov et al., 2009). In their study, Chochinov and his colleagues mapped "the landscape of distress" experienced by patients with life-limiting illness. The Patient Dignity Inventory (PDI) was developed as a novel way to detect and measure levels of dignity-related distress in palliative care patients (Chochinov et al., 2008). Using the PDI, they identified various factors contributing to end-of-life distress. Prominent amongst these was existential distress. While this may come as no surprise to most nurses providing end-of-life care, it is worth considering the extent to which nurses are trained or prepared to effectively and compassionately deal with these stressors in a therapeutic, rather than avoidant manner. All too often, we may feel uncomfortable talking about death and dying (either our patients' or our own), and what purpose or meaning this might hold for an individual. Another important consideration is identifying the presence and cause of distress in different patients. Clinical tools, such as the PDI, can serve to support clinicians in providing dignity-conserving end-of-life care.

Another tool that can assist patients deal with terminal illnesses is 'dignity therapy'. Dignity therapy is a course of psychotherapy that focuses on helping patients with terminal illnesses remember what is most meaningful to them and document their legacy.

Dignity therapy involves asking questions about life and work history and assisting patients to define and refine their legacy and decide what they want to pass down to their family and generations. This therapy encourages patients to say things to loved ones that may be able to achieve closure. Dignity therapy can help relieve sadness and depression in terminally ill patients.

Palliative care practitioners are able to respond adequately to the pain and physical distress experienced by their patients, but require more training to provide an adequate amount of emotional comfort to the patient and their families during the trying times.

Educating nurses in compassion and understanding of the hardship being faced by patients is imperative to enable nurses to treat patients with the care they require. Seeing the patient's issues through their eyes instead of the eyes of a care provider assists the nurse to see the patient as a person rather than a case, and allows the patient to have increased autonomy when it comes to choosing their treatments.

The introduction of support for clinicians' development of end-of-life care skills is an essential element of safe and high quality end-of-life care. It is important for health professionals to develop the communications skills required to talk to dying patients and their families. Nurses need to be confident in the care and comfort they provide and be able to deal with a wide range of responses to care by patients, their families and other carers.

Nurse leaders are required to assist in reshaping the culture of comfort and dignity in the healthcare system. By encouraging formal education that fosters a culture of caring in health professionals and by role modelling compassionate care, nurse leaders are able to ensure that patients are being provided with the respect they deserve. Senior staff are needed to support the right culture by role-modelling the delivery of physical and psychosocial care to end-of-life patients and their families. Role-modelling reinforces the importance of holistic care in a credible way. As care of the dying is a core skill in nursing, nurse leaders are considered crucial to the practical implementation of holistic end-of-life care.

It is important to recognise the commitment it takes from healthcare professionals in the acute, aged care, community and palliative settings to end-of-life patients, to ensure the patient is comfortable, respected and shown compassion. The combination of education and training, patient-centred care plans, dignity therapy and compassion will allow Australia to have a health care system where people can pass comfortably and at peace with the world. It is essential that health professionals understand that physical comfort in palliative care is not all that matters.

Personal Reflection

Jason Mills, registered nurse and PhD candidate, has extensive experience both working in palliative care and researching this specialised area of practice. Jason shares his experiences.

If there is one thing that I have learnt through nursing, it is that dying is part of living; and healing is possible even when cure is not. In all of our biomedical clinical focus to navigate a shift from curative to palliative care—where death becomes the tacit focus—we might sometimes forget that the 'dying' are still, indeed, living. It is imperative that within our clinical practice we appreciate the primacy of preserving dignity and respect for our patients' human experience of living with dying.

The late Dame Cicely Saunders, an internationally recognised pioneer of modern palliative care once said: "You matter because you are you, and you matter to the end of your life. We will do all we can not only to help you die peacefully, but also to live until you die."

To me, this encapsulates eloquently the essence of prioritising dignity in care for the dying. Attention to quality of life is paramount. This should encompass care for psychosocial and spiritual needs as much as it should include clinical assessment for management of physical symptoms.

However, the therapeutic relationship between nurse and patient does not conclude with the last breath. Even after death, respect and dignity are essential. Most commonly it is nurses (often with family members) who provide after-death care for a patient who has died. This involves the washing and preparation of the body to leave the clinical setting. From my experience, this ancient practice represents a profound opportunity for nurses to provide a final act of respectful and dignified care. When performed compassionately and skillfully, it can also afford family members a cathartic window towards healing in their bereavement.

ACN would like to acknowledge and thank Jason Mills for his assistance with this article.

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JULY

ANZICS – Safety & Quality Conference
6 – 7 July 2015, Sea World Resort, Gold Coast
www.sqao-anzics.com/

AUGUST

Health Informatics Conference – HIC 2015
3 – 5 August 2015, Brisbane QLD
www.hisa.org.au/hic2015/

SEPTEMBER

45th Annual Scientific Meeting
Australasian Society of Ultrasound in Medicine – ASUM
11 – 13 September 2015,
Doltone House, Sydney
http://asumconference.com.au

OCTOBER

The Institute of Hospitality in Healthcare
2015 Conference
12 – 14 October 2015, Brisbane
http://ihhc.org.au/events/conference-2015/conference-2015-overview/

OCTOBER

Australian & New Zealand Burn Association
39th Annual Scientific Meeting
20 – 23 October 2015, Crown Convention Centre, Melbourne
www.anzbaasm.com/

The Royal Australian & New Zealand College of Radiologists
66th Annual Scientific Meeting
29 Oct – 1 Nov 2015, Adelaide Convention Centre, Adelaide
www.ranzcr2015.com/

NOVEMBER

Australasian College for Infection Prevention & Control – ACIPC
22 – 25 November 2015
Grand Chancellor Hotel
Hobart, Tasmania
www.acipcconference.com.au/

For the latest event coverage visit our website
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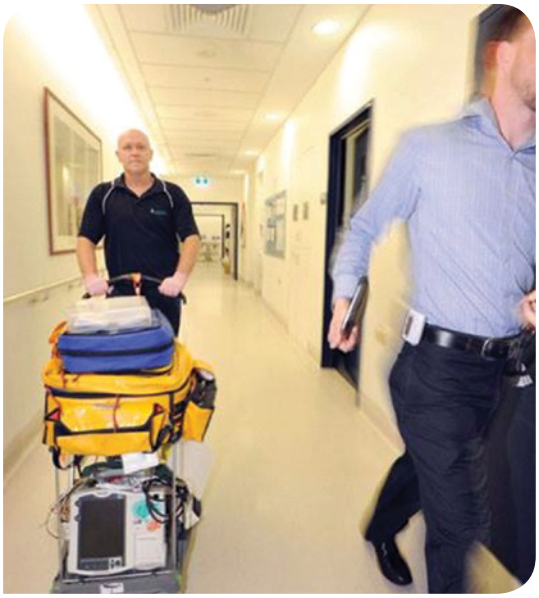
ANZICS Safety & Quality Conference: The Deteriorating Patient



Rapid Response Teams and Medical Emergency Teams were pioneered by Australian and New Zealand clinicians to improve the detection, recognition and response to deteriorating hospital patients[1]. There is now convincing evidence that their implementation is associated with reductions in the incidence of cardiac arrests in hospitalised patients[2]. Rapid Response Systems are an essential part of our hospital patient safety systems, and are a mandatory aspect of hospital accreditation.

In 2014, The Australian and New Zealand Intensive Care Society (ANZICS) convened the first Safety and Quality Conference on the role of the intensive care with Rapid Response Teams. This conference was over-subscribed and received overwhelmingly positive feedback. The findings of the conference were published in the journal *Anaesthesia and Intensive Care* [3].

The 2015 ANZICS Safety and Quality Conference will focus on Rapid Response Teams as well as broader aspects of deteriorating ward patients. Dr Michael DeVita, the inaugural President of the newly formed International Society of Rapid Response Systems will provide an update on the global perspective of the Rapid Response Teams.

This year there are two streams to the program with sessions including:

- Original research
- An update on Rapid Response Teams in Australia and New Zealand
- Rapid Response Teams in the Paediatric setting
- Deteriorating patients in the private sector.
- Unique aspects of Rapid Response Teams in specific settings such as the emergency department, sub-acute care, and in the obstetric setting.
- The role of Rapid Response Teams and end of life care
- Strategies to prevent Rapid Response Team calls

On the first day of the Conference, a forum will be held to scope and discuss the development of an educational and training curriculum for intensive care Rapid Response Team nurses.

In a "Meet the Experts" session, there will be an opportunity for delegates to meet experts to obtain advice about Rapid Response Teams and safety strategies for deteriorating patients to take back to their local hospital.

On the second day of the conference, there will be an entire stream outlining a model for how Rapid Response Team members should approach and manage deteriorating patients. This course will also provide practical advice on how senior clinicians can establish scenarios for team training.

The Program has relevance for intensive care doctors and nurses involved in the Rapid Response System, as well as intensive care liaison nurses. It is also relevant for ward-based clinicians who care for at-risk and deteriorating patients, hospital staff involved in the education of such clinicians, and quality coordinators involved in the assessment and implementation of elements of the Australian Commission on Safety and Quality in Health Care's National Safety and Quality in Health Service Standard Number 9 [4]. On behalf of ANZICS and the Organising Committee, we look forward to seeing you there.

Dr Michael DeVita
President iSRRS

A/Prof Daryl Jones,
Conference Convenor

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