

## Summary: *The role of innovation and a learning healthcare system in delivering safe and sustainable clinical services*

### Challenge

- The problems we face in healthcare delivery, as outlined in the Green Paper, are remarkably similar across the developed world.
- Now, and for the foreseeable future, countries must meet increasing healthcare demands with limited funding, while at the same time improving quality.
- Each stage of the healthcare delivery process is embedded with potentially significant shortcomings and inefficiencies that contribute to a large reservoir of missed opportunities, waste, and possible harm to patients.

### Solution

- There is a substantial evidence base for the clinical and economic benefits of innovation and continuous learning in healthcare organisations.
- The 'learning healthcare system' provides a conceptual framework for addressing challenges. The goal is to transition to a system that can adapt - that is, continuously learn how to improve, manage new challenges, and take advantage of opportunities.
- Fundamentally, to provide high quality and cost-effective care in Tasmania, there must be:
  - Exemplary governance of the new THS, with a visible and determined leadership by the CEO, executive and senior clinical staff, and
  - A culture of continuous improvement, committed to ongoing, real-time learning. Embedding this culture is not a simple one-off process.

### Implementation

- Health Services Innovation Tasmania (HSI Tas) is well positioned to work with Government and health organisations in ensuring the future quality, safety and sustainability of healthcare delivery in Tasmania.
- HSI Tas operates as an independent, state-wide research and implementation centre within the Faculty of Health, University of Tasmania, with expertise essential to the transformation of healthcare services.
- The funding of HSI Tas from the Commonwealth ceases in mid-2016, yet clinical redesign and continuous service improvement will need to be ongoing in the THS. The State Government should investigate the continued performance-dependent funding of HSI Tas.

## **The role of innovation and a learning healthcare system in delivering safe and sustainable clinical services**

**A learning healthcare system** is one in which science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the care process, patients and families being active participants in all elements, and new knowledge captured as an integral by-product of the care experience.<sup>1,2</sup>

The vision put forward in developing the Green Paper (*Delivering Safe and Sustainable Clinical Services*) is to be applauded. There is no reason why Tasmania cannot have the nation's leading health system and healthiest population; however, it can only be achieved **through** a genuine commitment to innovation in healthcare delivery and the associated development of a learning healthcare system in the state.

Such a system is designed to –

- generate and apply the best evidence for the collaborative healthcare choices of each patient and healthcare provider;
- drive the process of discovery as a natural outgrowth of patient care; and
- ensure innovation, quality, safety, and value in healthcare delivery.<sup>1</sup>

In the United Kingdom, the need to focus on innovation in healthcare has been clearly recognised and supported for some years. In early 2011, the Prime Minister announced that the National Health Service (NHS) Chief Executive would review how the adoption and diffusion of innovation could be accelerated across the NHS. The NHS Innovation report (*Innovation Health and Wealth, Accelerating Adoption and Diffusion in the NHS*) was released later that year.<sup>3</sup> This report sets out an integrated set of measures that together will support the adoption and diffusion of innovation across the NHS and set a delivery agenda that will significantly expedite the pace and scale of change and innovation in the healthcare system. There are considerable learnings in the report for Tasmania and other jurisdictions. The problems we face in healthcare delivery, as outlined in the Green Paper, are remarkably similar across the developed world. The difficulties facing the public health system in coping in a safe and efficient manner with growing demand and constrained resources are widely

acknowledged. Innovation is necessary to drive productivity and efficiency in such a difficult financial environment.

Healthcare often falls short of its potential in the quality of care delivered and the patient outcomes achieved. These shortfalls are occurring even as costs are rising to unsustainable levels.<sup>2</sup>

In many countries, each stage in the processes that shape the healthcare received - knowledge development, translation into evidence and application of evidence-based care - has significant shortcomings and inefficiencies that contribute to a large reservoir of missed opportunities, waste, and potential harm to patients.



**Figure 1.** Some major system deficiencies in healthcare delivery today<sup>3</sup>

Worldwide, there is also the realisation that major transformation in healthcare systems is needed. Now, and for the foreseeable future, countries must meet increasing healthcare demands from current real terms funding, while at the same time improving quality. This means that simply doing more of what has always been done is no longer a feasible option. We need to do things differently, and radically transform the way we deliver services. A recent Nuffield Trust report concluded that there would have to be an extra 22 hospitals with 800 beds each in the UK by 2022, to meet the growing demand, if the delivery of health services continues with the same operational models as at present.<sup>4</sup> Clearly, new approaches are needed in the delivery of healthcare.

Given the demand and funding pressures the NHS now faces, it is widely accepted that more of the same will not do. More radical changes in the way services are delivered and how people work will be required.<sup>3</sup>

Similarly, there is worldwide acknowledgment that individual health professionals and others involved in patient care work diligently to provide high-quality, compassionate care to their patients.<sup>2</sup> The answer is not that they should be working harder; it is that the systems do not adequately support them in their work. Staff are often contending with the challenges of systems that are poorly configured. These difficulties can be further exacerbated by administrative and organisational complexity that consumes valuable time that could be spent with patients. The path to improvement is to transform the current healthcare environment into a coordinated system of care. In short - by making the right thing easy to do, system-wide change can be achieved.<sup>2</sup>

Innovation is the only way to meet the challenges facing healthcare delivery.<sup>5</sup> Innovation must become core business for all health systems. Innovation should also be central to the future of the new Tasmanian Health System (THS) to simultaneously improve the quality of care for patients and release Government funds through productivity.

Innovation:

- transforms patient outcomes;
- encourages staff to perform at their optimum and in a collaborative manner;
- improves quality and productivity; and
- is good for economic growth.<sup>3</sup>

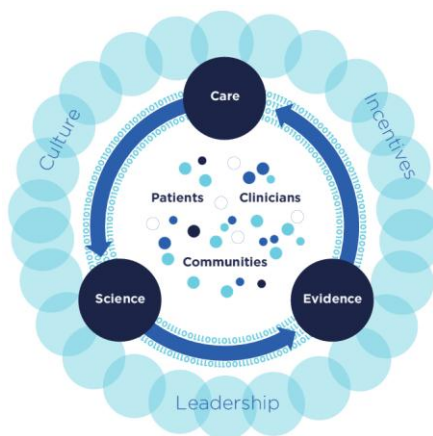
Searching for and applying innovative approaches to delivering healthcare must be an integral part of the way the new THS does business, from day one. Doing this consistently and comprehensively will dramatically improve the quality of care and services for patients.<sup>3</sup> It will deliver the productivity savings we need to meet the growing demand for services, and it will also support economic growth for the State.

Organisations that are able to innovate successfully have developed a culture of innovation throughout their organisation, and at all levels. This is about people understanding why innovation is important, creating time and space for people to innovate and rewarding innovators. It is about developing both capacity and capability.

It also requires stronger relationships with the scientific and academic communities and industry to develop solutions to healthcare problems and ensure that existing solutions spread at pace and scale in the THS (as addressed in a separate submission by the Faculty of Health, University of Tasmania). Health systems also need to develop much stronger knowledge exchange networks to share best practice.

Achieving innovation and a successful, sustainable healthcare system will require the right culture and embracing the concept of becoming a learning organisation. The foundation for a learning healthcare system is continuous knowledge development, improvement, and application.<sup>1</sup> The new THS must continuously learn and improve in order to achieve the vision presented in the Green Paper. There are also opportunities to benefit from the lessons learned by pioneer organisations elsewhere; experiences must be diffused more broadly so that whole systems can benefit.<sup>2</sup>

As outlined by O'Sullivan,<sup>6</sup> healthcare organisations cannot afford the illusion of traditional strategic planning, with its emphasis on bureaucratic controls from the top to the bottom. They must embrace the fundamental truth that most change occurs through processes of learning that occur in many locations simultaneously throughout the organisation. Healthcare leaders must create a shared vision of where an institution is heading rather than what the final destination will be, nurture a spirit of experimentation and discovery rather than close supervision and unbending control, and recognise that plans have to be continuously changed and adjusted.



**Figure 2.** A continuously learning and improving healthcare system<sup>3</sup>

The Berwick report<sup>7</sup> (A promise to learn - a commitment to act) was commissioned as part of the investigation into the failings of the Mid Staffordshire NHS Foundation Trust, as reflected in poor care and high mortality rates observed amongst patients at the Stafford Hospital. The report, as indicated by its name, highlighted the necessity of healthcare systems to develop into learning organisations. One quote from Berwick was “the NHS should be devoted to continual learning and improvement of patient care, top to bottom and end to end”.

The Institute of Medicine’s 2013 report (*Best care at lower cost: The path to continuously learning healthcare in America*) clearly and compellingly presents a vision of what is possible if a nation applies the resources and tools at hand by marshalling research, information technology, incentives, and care culture to transform the effectiveness and efficiency of care, to produce high-quality healthcare that continuously learns to be better.<sup>2</sup>

A learning healthcare organisation harnesses its internal wisdom - staff expertise, patient feedback, financial data, and other knowledge - to improve its operations. It engages in a continuous feedback loop of monitoring, assessing what can be improved, testing and adjusting in response to data, and implementing its findings.<sup>2</sup>

The Institute of Medicine report defines the core attributes of a learning healthcare system as:<sup>2</sup>

#### **Patient-Clinician Partnerships**

***Engaged, empowered patients*** - A learning healthcare system is anchored on patient needs and perspectives, and promotes the inclusion of patients, families, and other caregivers as vital members of the continuously learning care team.

#### **Continuous Learning Culture**

***Leadership-instilled culture of learning*** - A learning healthcare system is stewarded by leadership committed to a culture of teamwork, collaboration, and adaptability in support of continuous learning as a core aim.

***Supportive system competencies*** - A learning healthcare system constantly refines complex care operations and processes through ongoing team training and skill building, systems analysis and information development, and the creation of feedback loops for continuous learning and system improvement.

#### **Informed by Data and Research**

***Real-time access to knowledge*** - A learning healthcare system continuously and reliably captures, analyses, and delivers the best available evidence to guide, support, tailor, and improve clinical decision making and care safety and quality.

**Digital capture of the care experience** - A learning healthcare system captures the care experience for real-time generation and application of knowledge for care improvement.

#### **Incentives and Transparency**

**Incentives aligned for value** - A learning healthcare system has incentives actively aligned to encourage continuous improvement, identify and reduce waste, and reward high-value care.

**Full transparency** - A learning healthcare system systematically monitors the safety, quality, processes, costs and outcomes of care, and makes information available for care improvement and informed choices and decision making by clinicians, patients, and their families.

The enormity of the challenges currently facing the healthcare system can be overwhelming to the professionals seeking to improve outcomes for the public. The learning healthcare system provides a conceptual framework for addressing these challenges.<sup>2</sup> The goal is not to instantly create an ideal system that overcomes all of today's challenges. Instead, the goal is to transition to a system that can adapt - that is, continuously learn how to improve, manage new challenges, and take advantage of opportunities. To learn means to face the unknown: to recognise that we do not possess all the answers. Hospitals and other healthcare organisations must seek to develop and maintain a continuing state of readiness in which everyone in the organisation, from front-line clinician to senior management, is poised to act in anticipation of and in response to unforeseen changes in the environment and to learn from their own experiences in confronting the future.<sup>6</sup>

**Importantly, however, there is a substantial evidence base for the clinical and economic benefits of innovation and continuous learning in healthcare organisations.<sup>1,2,8</sup>** It is not simply a theoretical construct. For instance, hospitals ranking in the top 5% for acute myocardial infarction (heart attack) outcomes were characterised by an organisational culture that supported efforts to improve care across the hospital.<sup>9</sup> The high-performing hospitals had a strong leadership and governance commitment to improvement, good communication and coordination, shared values and culture, and experience with problem solving and learning.

Kaiser Permanente's strategy for creating a learning organisation was based on six "building blocks" –

- real-time sharing of meaningful performance data;
- formal training in problem-solving methodology;

- workforce engagement and informal knowledge sharing;
- leadership structures, beliefs, and behaviours;
- internal and external benchmarking; and
- technical knowledge sharing.<sup>8</sup>

Although each step along the path to building a learning healthcare system is important, none by itself is sufficient. Rather, the host of needed changes must be interwoven to achieve a common goal: healthcare organisations that are devoted to optimising practices, continually improving the value achieved by care and streamlining processes to provide the best health outcomes for patients. Most vital to building a continuously learning organisation is leadership and governance that defines, disseminates, and supports a vision of continuous improvement.<sup>10,11</sup> Strong, visible leadership will be necessary from all sectors of the Tasmanian healthcare system if the vision and outcomes of a learning healthcare system are to be realised.

In a learning healthcare system, the leadership establishes the system's vision, communicates its core values, and makes learning and improvement a priority. In addition, healthcare system leaders help guide the culture of their organisation, which has a substantial impact on health outcomes, patient experience, and the satisfaction of employees. A poor culture can present barriers to learning, while a strong culture can drive change.<sup>10-15</sup> Hospitals whose leaders are heavily engaged in quality improvement efforts tend to provide higher-quality care.<sup>8,9,15-19</sup>

The culture of healthcare is central to promoting learning at every level.<sup>2</sup> Creating continuously learning organisations requires strong leadership and governance that define, disseminate, and support a vision of continuous improvement. The culture should emphasise teamwork, adaptability, and coordination. To promote such an environment, healthcare leaders must know how to influence, support, and measure their organisation's culture. Further, leadership must require visible accountability for improved performance in such areas as quality and safety.

**Fundamentally, the provision of high quality and cost-effective care assumes, (1) exemplary governance of the new THS, with a visible and determined collective leadership by the CEO,**

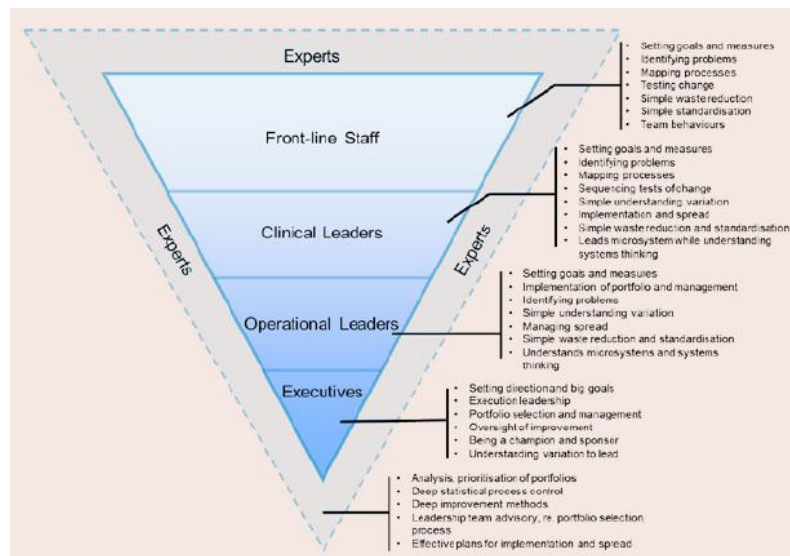


**executive and senior clinical staff, and (2) a culture of continuous improvement, committed to ongoing, real-time learning.<sup>7</sup>**

To achieve high performance, the health system culture must encourage coordination and teamwork, as well as promote a non-punitive environment in which healthcare professionals feel free to report potential problems. In contrast, the current healthcare culture is generally centred on the autonomy of the individual health professional. Clinician expertise is crucial, but this type of culture often leads to a system in which each individual pursues his or her own judgment instead of collaborating to provide the best care for the patient. Effective care must be delivered by collaborations between teams of clinicians and patients, each playing a vital role in the care process.

A healthcare system that promotes continuous learning and improvement is one that makes the right thing easy to do. Its environment simplifies procedures and workflows, so that health professionals and support staff can operate at peak performance to care for patients. This not only improves care delivery and patient outcomes; it also reduces stress on the front-line care providers, improves job satisfaction, and prevents staff burnout.

It should be acknowledged that no single individual, organisation, or sector alone can produce the scope and extent of transformative change necessary for a true learning healthcare system. Leadership and a shared vision are necessary at all levels of the healthcare system to prompt its disparate elements to work together toward a common end. In effect, leadership from all sectors working in concert will be required (Figure 3). To complement leadership at the top, a continuously learning organisation also requires leadership on the part of the middle managers, unit leaders and front-line workers who translate an expressed vision into practice. Leadership qualities are not innate to every healthcare leader and worker; they must be actively taught and reinforced if strong leadership is to become widely available throughout the system.



**Figure 3.** Representation of the capability which should be expected from each level in a healthcare organisation<sup>7</sup>

It has been noted that hospital leaders, including executive management and clinical staff, are responsible for improving care, yet they often address this duty independently.<sup>20</sup> Shared responsibility for quality and patient safety improvement presents unique challenges, yet quality improvement strategies rooted in synergistic efforts by the executive and the clinical staff offer the greatest potential for safer care. Both groups benefit from a better understanding of their synergistic potential. Such an approach requires a clear appreciation of roles and responsibilities, and mutual respect for differences.<sup>20</sup>

Tension can sabotage real improvement because almost all improvements require co-operation between administrators and clinicians. Physicians and administrators alike must respect and trust each other if true improvement is to flourish.<sup>21</sup>

The University of Tasmania was allocated \$12 million by the Australian Government, through the Tasmanian Health Assistance Package, to work with the State and help implement a program of clinical redesign in the Tasmanian hospital system. In early 2014, the University subsequently established Health Services Innovation Tasmania (HSI Tas; [www.healthinnovation.tas.edu.au](http://www.healthinnovation.tas.edu.au)), in the School of Medicine, Faculty of Health, to develop clinical redesign training programs and to build clinical redesign capacity in Tasmania, particularly within the State's public hospitals.

While the focus is on the acute hospital sector, the critical importance of the community interface is recognised and the work is fostering cross-sector collaboration, particularly via joint activities with Tasmania Medicare Local. Key objectives of the program are to:

- build capacity and capability for clinical redesign in Tasmania, drawing on experiences nationally and internationally;
- enable clinicians and health system managers to identify and drive changes in hospital and other healthcare processes;
- develop health leadership expertise in Tasmania, throughout the health system;
- collaborate closely with health service leaders across Tasmania in identifying and implementing clinical redesign projects; and
- contribute to skills and knowledge transfer in clinical redesign, helping to develop a sustainable culture of clinical redesign within the State.

The HSI Tas vision is to help create a Tasmanian healthcare system committed to ongoing improvement in the quality, effectiveness and safety of care delivery through education, evaluation, and strategic innovation – essentially a learning healthcare system in Tasmania. Its corporate motto is “Working together to improve healthcare”. With the hospitals, HSI Tas will embed evidence-based clinical redesign to improve health service capacity and sustainability. A key aim of the program is to ensure that implemented changes and an improvement culture are sustainable into the future.

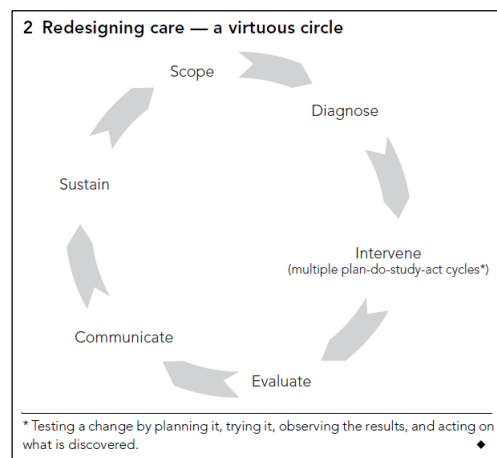
The Tasmanian Health Partners Consortium acts in an advisory capacity for the program, and facilitates partnerships between key parties; it includes the Federal Department of Health, a representative of the Tasmanian Minister for Health, the Department of Health and Human Services, the three Tasmanian Health Organisations, Tasmania Medicare Local, University of Tasmania and a consumer representative. The Health Partners Consortium is led by an Independent Chair (Dr Brendan Murphy, CEO of Austin Health, Melbourne). From its inception, HSI Tas has networked closely, whether through formal or informal linkages, with other organisations working in health service improvement.

Clinical redesign is an evidence-based approach to mapping, analysing, refining and improving the delivery of healthcare services.<sup>22-25</sup> Clinical redesign is essential in order to

address the escalating demand for, and rising cost of, services within the system. In the USA, the term “systems engineering” is generally used.<sup>25</sup>

Clinical redesign is an approach to making the current state visible, analysing the problems and opportunities within the processes, then proposing and implementing interventions, and finally evaluating the interventions (Figure 4). Clinical redesign is a problem solving methodology, based on the principles of continuous learning in health systems, which may be utilised in both clinical and non-clinical settings, and aims to:

- improve service delivery across all aspects of the patient’s journey;
- identify the root causes of issues impacting the delivery of care;
- develop, implement and evaluate sustainable change processes to improve the way healthcare is delivered;
- reduce errors and adverse events; and
- maximise the use of resources to improve access and timeliness of care.



**Figure 4.** The clinical redesign cycle of improvement<sup>23</sup>

In Victoria, an independent evaluation of the \$21M clinical redesign program in the State’s hospitals (Redesigning Hospital Care Program) was overwhelmingly positive and identified a high level of support for the program and its continuation from stakeholders.<sup>26</sup> All reviewed projects had demonstrated a meaningful return on investment, with the most successful projects in financial terms achieving a more than 10:1 return on investment. Staff at all levels within participating health services recognised the benefits of redesign, sought

to be involved in redesign projects and used knowledge of redesign to underpin process change and improvement.

There are also many international examples demonstrating the clinical and economic benefits of clinical redesign/systems engineering.<sup>1,2,10,25,27,28</sup> Denver Health introduced Lean process improvement across the organisation in 2006 and by 2012 had realised US\$151 million in financial benefits, as well as the lowest observed-to-expected hospital mortality rate in a consortium of academic medical centres and affiliated hospitals. Improvements in patient flow at Cincinnati Children's Hospital Medical Centre enabled savings of US\$100 million in avoided capital expenses that would have gone to the purchase of 100 new beds. Improved patient flow also led to greater work satisfaction among staff and reduced wait times for patients.

HSI Tas is established upon a core research and education capability, and will provide a major contribution to the national and international evidence base for clinical redesign and health service improvement activities. This will distinguish HSI Tas from other redesign organisations in Australia, and will ensure that Tasmanian learnings and outcomes are in the public domain, contributing to the uptake and sustainability of clinical redesign activities in this State and elsewhere.

HSI Tas is providing a range of training programs in clinical redesign for the State's health workers, as well as developing and offering innovative online modules and units in clinical redesign, health leadership, health services research and healthcare improvement. In addition, HSI Tas also has PhD students investigating a variety of topics, ranging from addressing medical patient flow through hospital and long waiting lists for outpatient clinics, through to organisational influences on hospital performance and developing and evaluating leadership training for clinical and managerial staff.

Some achievements of HSI Tas to date include:

- Clinical Redesign Offices have been established within each THO, with senior clinical leads and experienced project officers;
- linkages and strategic alliances have been developed with key health service improvement agencies in Australia and overseas;

- projects are underway across the State in the initial Key Priority Areas of emergency access and bed capacity, overall bed demand and flow (particularly relating to medical and older patients) and elective surgery. A rigorous diagnostic evaluation has begun in mental health;
- over 20 clinical redesign/health service improvement training programs of varying lengths and intensities have been held for THO staff and others;
- undergraduate teaching of clinical redesign principles has commenced across all professional health programs at the University of Tasmania, with ongoing discussions with the Agency for Clinical Innovation (NSW) to offer a joint postgraduate course; and
- an extended course and mentoring program for Leadership in Health will be launched in March 2015.

It is intended that HSI Tas will become recognised as a national and international leader in health services training and research innovation. In that vein, HSI Tas is hosting an inaugural international conference on health service improvement, 'Sustainable Healthcare Transformation', scheduled in Hobart from 18-20 March 2015

([www.healthcaretransformation.com.au](http://www.healthcaretransformation.com.au)). The conference will focus on innovation and new thinking in healthcare delivery, culture change within hospitals and healthcare management, the importance of clinical/health leadership, engagement between clinicians and health service executives, and patient centredness.

An outstanding group of keynote speakers from health and other industries will be presenting. Sir Robert Naylor has been Chief Executive of University College London Hospitals (UCLH) since 2000, and a Chief Executive in the NHS for 24 years (currently the longest serving CEO in the NHS). UCLH comprises six major hospitals in central London. Professor Chris Baggoley is the Chief Medical Officer for the Australian Government and principal medical adviser to the Minister and the Department of Health. An emergency medicine physician, he was previously Chief Executive of the Australian Commission on Safety and Quality in Health Care, and Chief Medical Officer and Executive Director with the South Australian Department of Health.

In addition, we will be hosting leading international speakers from the Mayo Clinic (Associate Professor Kalyan Pasupathy, Co-Scientific Director - Healthcare Systems Engineering Program

and Scientific Director - Clinical Engineering Lab) and University of Oxford (Professor Andrew Pettigrew OBE, Professor of Strategy and Organisation at the Saïd Business School).

Also presenting will be Professor Jeffrey Braithwaite, Director of the Australian Institute of Health Innovation at Macquarie University, Associate Professor Andrew Way, Chief Executive Officer, Alfred Health, Victoria and former colleague of Sir Robert Naylor, and Janet Compton, Chief Executive Officer, Northern Health, Victoria. We are fortunate to have attracted Dr Anthony McCann, prominent Irish social philosopher and contemplative scholar. He is an international expert in training and coaching for culture change in organisations, communities, and environments.

In one half-day seminar, Sir Robert Naylor and Associate Professor Andrew Way will present on the importance of, and how to achieve, learning organisations in health care delivery: "Creating learning organisations in health – the UK and Australian experience".

Having now established a solid base, **HSI Tas provides an ideal vehicle to help the Tasmanian Government drive innovation, quality and cost-effectiveness in healthcare delivery, and the associated development of a learning healthcare system for all Tasmanians.** HSI Tas is independent, evidence-based, operates State-wide and works with stakeholders to establish the desire for change through collaboration and consensus. HSI Tas is able to provide expertise in evidence-based decision making and advice; improvement program design; data and system-diagnostic services, education, training and capacity building services. Furthermore, HSI Tas has the skills to assist the Government in the implementation and ongoing evaluation of the system changes that are likely to be announced in the White Paper.

**Conclusions**

1. The Green Paper is a positive document for stimulating analysis and discussion of whole of system thinking and an evidence-based approach to designing healthcare delivery. This is the only path to sustainability in the provision of health services in Tasmania (and all jurisdictions). The focus on patients and the provision of care of the highest quality and safety, necessitating the design of services through an agreed role delineation framework, is incontrovertible.
2. The necessary reform of the Tasmanian health system will require a strong commitment to innovation and the associated development of a learning healthcare system.
3. This process assumes both exemplary governance of the new THS, with visible and determined collective leadership by the senior executive and clinical staff, and a culture of continuous improvement, committed to ongoing, real-time learning.
4. Health Services Innovation Tasmania (HSI Tas) is well positioned to work with Government in ensuring the future quality, safety and sustainability of healthcare delivery in Tasmania. HSI Tas operates as an independent, state-wide research and implementation centre within the Faculty of Health, University, with expertise essential to the transformation of healthcare services: evidence-based decision making and advisory capability; improvement design; data and system-diagnostic services, education, training and capacity building services; and project and program evaluation services. HSI Tas has worked with the key stakeholders to embed clinical redesign methodology in Tasmanian hospitals, and has promoted a groundswell of enthusiasm amongst clinicians for improvement in service design and care delivery based on the best evidence. It is also developing a Senior Leadership Program and Leadership framework, involving both health professionals and health managers.
5. Clinical redesign and continuous service improvement will need to be supported in the THS past the completion of the current Commonwealth funding of HSI Tas in June, 2016. The State Government should investigate the continued performance-dependent funding of HSI Tas.



## References

1. IOM (Institute of Medicine). 2010. Value in health care: accounting for cost, quality, safety, outcomes and innovation: Workshop Summary. Washington, DC: The National Academies Press.
2. IOM (Institute of Medicine). 2013. Best care at lower cost: The path to continuously learning health care in America. Washington, DC: The National Academies Press.
3. Department of Health. 2011. Innovation health and wealth. London: Department of Health.
4. Nuffield Trust. 2104. NHS hospitals under pressure: trends in acute activity up to 2022. London: Nuffield Trust. <http://www.nuffieldtrust.org.uk/publications/nhs-hospitals-under-pressure-trends-acute-activity-2022>
5. Lazarus IR, Fell D. Innovation or stagnation? Crossing the creativity gap in healthcare. *J Healthc Manag* 2011;56(6):363-7.
6. O'Sullivan MJ. Strategic learning in healthcare organizations. *Hosp Top* 1999;77(3):13-21.
7. UK Government. 2013. A promise to learn – a commitment to act. Improving the Safety of Patients in England. National Advisory Group on the Safety of Patients in England (<https://www.gov.uk/government/publications/berwick-review-into-patient-safety>)
8. Schilling L, Dearing JW, Staley P, Harvey P, Fahey L, Kuruppu F. Kaiser Permanente's Performance Improvement System, Part 4: Creating a Learning Organization. *Joint Commission Journal on Quality & Patient Safety* 2011;37(12):532-53.
9. Curry LA, Spatz E, Cherlin E, Thompson JW, Berg D, Ting HH, et al. What distinguishes top-performing hospitals in acute myocardial infarction mortality rates? A qualitative study. *Ann Intern Med* 2011;154(6):384-90.
10. Cosgrove D, Fisher M, Gabow P, Gottlieb G, Halvorson G, James B, Kaplan G, Perlin J, Petzel R, Steele G, Toussaint J. 2012. A CEO checklist for high-value health care. Discussion Paper, Institute of Medicine, Washington, DC. <http://www.iom.edu/CEOChecklist>.
11. Masso M, Robert G, McCarthy G, Eagar K. The Clinical Services Redesign Program in New South Wales: perceptions of senior health managers. *Aust Health Rev* 2010;34(3):352-9.
12. Schein EH. 2004. Organizational culture and leadership. San Francisco, CA: Jossey-Bass.
13. IOM (Institute of Medicine). 2001. Crossing the quality chasm: A new health system for the 21st century. Washington, DC: National Academies Press.
14. NRC (National Research Council). 2011. Strategies and priorities for information technology at the Centers for Medicare & Medicaid Services. Washington, DC: The National Academies Press.

15. Lukas CV, Holmes SK, Cohen AB, Restuccia J, Cramer IE, Shwartz M, et al. Transformational change in health care systems: an organizational model. *Health Care Management Review* 2007;32(4):309-20.
16. Vaughn T, Koepke M, Kroch E, Lehrman W, Sinha S, Levey S. Engagement of leadership in quality improvement initiatives: Executive quality improvement survey results. *Journal of Patient Safety* 2006;2(1).
17. Sinkowitz-Cochran RL, Burkitt KH, Cuerdon T, Harrison C, Gao S, Obrosky DS, et al. The associations between organizational culture and knowledge, attitudes, and practices in a multicenter Veterans Affairs quality improvement initiative to prevent methicillin-resistant *Staphylococcus aureus*. *American Journal of Infection Control* 2012;40(2):138-43.
18. Jiang HJ, Lockee C, Bass K, Fraser I. Board engagement in quality: findings of a survey of hospital and system leaders. *Journal of Healthcare Management* 2008;53(2):121-34.
19. Jiang HJ, Lockee C, Bass K, Fraser I. Board oversight of quality: any differences in process of care and mortality? *Journal of Healthcare Management* 2009;54(1):15-30.
20. Goeschel CA, Wachter RM, Pronovost PJ. Responsibility for quality improvement and patient safety: hospital board and medical staff leadership challenges. *Chest* 2010;138(1):171-8.
21. Reinertsen JL. Physicians as leaders in the improvement of health care systems. *Ann Intern Med* 1998;128(10):833-8.
22. O'Connell TJ, Ben-Tovim DI, McCaughan BC, et al. Health services under siege: the case for clinical process redesign. *Med J Aust* 2008;188(6 Suppl):S9-13
23. McGrath KM, Bennett DM, Ben-Tovim DI, et al. Implementing and sustaining transformational change in health care: lessons learnt about clinical process redesign. *Med J Aust* 2008;188(6 Suppl):S32-5
24. Ben-Tovim DI, Bassham JE, Bennett DM, et al. Redesigning care at the Flinders Medical Centre: clinical process redesign using "lean thinking". *Med J Aust* 2008;188(6 Suppl):S27-31
25. President's Council of Advisors on Science and Technology. 2014. Report to the President. Better health care and lower costs: accelerating improvement through systems engineering. Washington, DC: Executive Office of the President.  
(<http://www.whitehouse.gov/administration/eop/ostp/pcast/docsreports>)
26. DLA Piper Australia. 2012. Redesigning Hospital Care – report on program evaluation.  
<http://www.health.vic.gov.au/redesigningcare/evaluation.htm>
27. IOM (Institute of Medicine). 2010. The healthcare imperative: Lowering costs and improving outcomes: Workshop series summary. Washington, DC: The National Academies Press.
28. Joint Commission. 2009. Managing patient flow in hospitals: Strategies and solutions. 2nd ed., edited by E. Litvak. Oak Brook, IL: Joint Commission Resources, Inc.