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# Horizon Paper

## Health Workforce Reform Leveraged through Medical Education and Accreditation:

**A review of the current and future directions of the AMC and its partners using the example of the health reform priority - building a digitally capable medical workforce.**

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Australian Medical Council (AMC)

Australian Digital Health Agency (Agency)



# Contents

<b>Executive Summary .....</b>	<b>4</b>
<b>Regulation, Reform and Digital Capability Development .....</b>	<b>5</b>
Future Opportunities .....	5
<b>Levers for Change, Eight Key Areas of Collaboration in Health Reform .....</b>	<b>10</b>
<b>1. Thought Leadership .....</b>	<b>11</b>
Future Opportunities .....	11
Recommendations .....	20
<b>2. Cross Continuum, Interprofessional, &amp; Inter-Agency Collaboration .....</b>	<b>21</b>
Future Opportunities .....	21
Recommendations .....	25
<b>3. Capability Frameworks for Medicine .....</b>	<b>26</b>
Future Opportunities .....	26
Recommendations .....	26
<b>4. Good Practice Curated Collections and Support .....</b>	<b>28</b>
Future Opportunities .....	28
Recommendations .....	30
<b>5. Certification .....</b>	<b>31</b>
Future Opportunities .....	31
Recommendations .....	37
<b>6. Assessment and Measurement of Impact .....</b>	<b>38</b>
Future Opportunities .....	38
Recommendations .....	42
<b>7. AMC Accreditation .....</b>	<b>43</b>
Future State .....	43
Recommendations .....	48
<b>8. Embedding Change in Complex Systems .....</b>	<b>49</b>
Future State .....	49
Recommendations .....	56
<b>Summary of Recommendations.....</b>	<b>57</b>
<b>Appendix 1: Levers for Change – Eight Key Areas of Future Collaboration ....</b>	<b>58</b>
<b>Appendix 2: Health Reform - Twelve Key Priorities .....</b>	<b>61</b>
<b>Appendix 3: Definitions of Certification Categories.....</b>	<b>62</b>
<b>Appendix 4: Measuring Impact in Digital Health in Medical Education .....</b>	<b>64</b>
<b>Appendix 5: Question Guide for Implementation and Embedding the Change .....</b>	<b>68</b>
<b>References .....</b>	<b>72</b>

# Executive Summary

*Doctors are called on to plan for a world where technology and artificial intelligence will play a greater role, and health challenges and disruptions to workforce systems are increasingly complex.*

This horizon paper was developed by the Australian Medical Council in partnership with the Australian Digital Health Agency. This discussion paper explores areas of future collaboration and strategic focus of the Australian Medical Council (AMC) and its partners in shifting medical education and AMC accreditation to focus more firmly on achieving health workforce reform. As a starting point, this paper provides, as an illustrative example, one key area of workforce health reform - *the need to build a digitally capable medical workforce*. It is demonstrated that such change is best achieved through collaboration, alignment of goals and approaches adopted (from nationally and internationally evidence-based health reform policy) to help shape the Australian medical education system.

The paper draws on Malcolm Sparrow's work, a thought leader in regulation. Whilst the AMC is not in itself a regulator, but rather an accreditation and standard setting body, it works closely with the Medical Board of Australia and performs a key role under National Law in the accreditation of medical education providers. The purpose of this discussion of Sparrow's work is to provide the theoretical framework for some of the ideas in this paper.

Central to this paper is the exploration of 8 levers of workforce change, supporting medical education providers and other key stakeholders across the medical education continuum, that affect positive change in health reform:

- 1. Thought Leadership**
- 2. Cross Continuum, Interprofessional and Inter-Agency Collaboration**
- 3. Capability Frameworks for Medicine**
- 4. Good Practice Curated Collections and Support**
- 5. Assessment and Measurement of Impact**
- 6. Certification**
- 7. AMC Accreditation**
- 8. Embedding Change.**

These strategies are important to better prepare the Australian medical workforce for the 21st century challenges in healthcare delivery. See Appendix 1 for a summary of these levers of workforce change.

This horizon paper identifies 12 broad areas of health reform that impact medicine and medical education. Digital health in medicine, is one of the 12 areas of health reform, is used as an example in this paper. These 12 broad areas of health reform are listed in Appendix 2.

# Regulation, Reform and Digital Capability Development

*In this section, we introduce a summary of the key ideas of the thought leader in regulation, Malcolm K Sparrow, with an explanation of the current and future state and recommendations for future action related to digital health in medicine. In presenting his ideas, it is noted that the AMC is clearly a standard setting and assessment body and not a regulator. The focus on regulation and reform is nevertheless useful, as the key themes discussed explain the approach to standard setting, which the AMC has strongly integrated into its practice over a long period of time – voluntary compliance and support rather than punitive compliance methods.*

## **Regulatory practice and reform – Malcolm K. Sparrow – Thought Leader.**



Malcolm K. Sparrow is a leading international expert in regulatory and enforcement strategy, security and risk control. He is the Professor of the Practice of Public Management at the John F. Kennedy School of Government, Harvard University, and Faculty Chair of the Executive Program on Strategic Management of Regulatory and Enforcement Agencies.

He is the author of nine books, including the recently released Fundamentals of Regulatory Design (2020), and the widely acclaimed The Regulatory Craft: Controlling Risks, Solving Problems and Managing Compliance (2000), and The Character of Harms: Operational Challenges in Control (2008).

## **Future Opportunities**

Sparrow sees current trends to regulatory practice within a historical context where:

The dichotomy between regulatory styles has been around for decades, albeit under a variety of labels. What popular lexicon now presents as enforcement versus voluntary compliance appeared in the 1970s and 1980s as deterrence versus compliance or (for other commentators) enforced compliance versus negotiated compliance. Whatever the labels, one style revolves around formal, precise rules and is viewed as adversarial and punitive and is based on an underlying distrust of the regulated community. The other style is seen as softer, more results oriented and less wed to rules, stressing responsiveness and forbearance and preferring tools involving trade-offs, gaming tactics, persuasion and negotiation.

Sparrow's analysis of trends in regulation points to the need for the AMC to consider how to achieve a balanced approach to its practice, which has impact and "teeth" so provider compliance with standards and accreditation processes is maximised, whilst also providing support and leadership to foster best practice within a more negotiated and consultative framework.

## Problems regulatory reform seeks to solve

### Opportunities to Foster Thought Leadership in Digital Health Capability Development in Medicine within the context of regulatory practice: An analysis of the AMC against Sparrow's framework of challenges and solutions.

Sparrow (2000) starts his thesis with an examination of the problems with regulatory practice. The table below sets out the key themes identified by Sparrow. It considers the relevance of each element within the Australian regulatory context as well as proposing current opportunities to better address these concerns. These themes and opportunities for innovation are further explored in the recommendations and summaries at the conclusion of this paper.

He cites the following key challenges:

Elements	Challenges	Proposed Opportunities
<b>Volume and complexity</b>	<p><b>1. The Volume and Complexity of Regulations</b></p> <p><i>Reduction of regulation with anti-competitive effect and reduction of bureaucratization, which will help the economy to keep pace with global competition.</i></p> <p>The overarching purpose of medical education is to provide medical professions with the skills, knowledge and attitudes which equip them for safe and quality health care delivery. The global COVID-19 pandemic has brought into stark relief how integral health is to the economic wellbeing of Australia.</p> <p>The AMC has an opportunity to align its focus on measurement of accreditation and assessment of medical education providers and professionals to real world impacts and health reform priorities in healthcare delivery and workforce change. This will ensure that the goals of accreditation focus on real world health priorities and needs.</p> <p>The partnership with the Australian Digital Health Agency and other key stakeholders in digital health provides a framework for supporting the medical education providers to be more work ready and helps the economy keep pace with global competition through building a digitally capable medical workforce. Further, it explores opportunities to form partnerships to address other areas of priority health reform (see 12 priorities outlined in this discussion paper).</p>	<p>Governance Reform – with focus on Inter-professionalism and Collaboration</p> <p>Partnerships</p> <p>Stakeholder engagement</p> <p>Accreditation Review</p> <p>Process Improvement</p> <p>Communication</p>
<b>Cost-benefit</b>	<p><b>2. The Cost-Benefit Equation</b></p> <p><i>A focus on the cost of regulation. This includes quantitative and qualitative analysis of value to ensure that cost-benefit is not assessed in purely financial terms but also considers broader socio-political benefits.</i></p> <p>The AMC has a business model which is reliant on key activities – largely the International Medical Graduate (IMG) examinations. The AMC has an opportunity to formalise its cost-benefit analysis of expanded activities such as the Digital</p>	<p>Cost-benefit analysis</p> <p>Product Diversification</p> <p>Communication</p> <p>Evaluation</p>

	<p>Health Partnership and other key partnerships on health reform with the Commonwealth Government of Australia. As part of the offerings of such contracts, it could conduct analysis of broader socio-political benefits of implementation of key initiatives (i.e. impacts of capability development across the medical continuum based on stakeholder feedback and evaluation and other platforms of health reform).</p>	
<p><b>Irrational distribution of regulatory attention</b></p>	<p><b>3. The irrational distribution of regulatory attention</b></p> <p><i>Analysis of regulation across a sector to identify comparison of risk.</i></p> <p>Through its accreditation function and broad remit of accreditation across the medical education continuum, the AMC is well placed to identify common issues and differences as well as key risks across the sector. The AMC has an opportunity to develop clearer communication, good practice support and thought leadership to assist education providers to make step changes to learn from each other, and understand how to mitigate risk and innovate in areas of agreed health reform based on evidence and experience.</p> <p>The AMC has clear standards which have evolved over a long period of time. The AMC has an opportunity to review its standards and accreditation model in light of its strategy development and anticipation of future disruptions and challenges facing doctors and the broader health system. This also involves an opportunity to engage in governance reform and stakeholder engagement with a focus on further partnerships to drive change across the health sector. This priority also includes the preparation of guides and publication of curated collections of good practice case studies and resources which can be used to help guide innovation and consistency across the medical education continuum. Such support will also ensure that all medical education providers can meet required standards and have a common and shared view on what constitutes good practice.</p>	<p>Governance Reform – with focus on Inter-professionalism and Collaboration</p> <p>Stakeholder engagement</p> <p>Standards Review</p> <p>Accreditation Review – Process Improvement and streamlining of methodology system-wide</p> <p>Communities of practice and other supportive mechanisms for learning and growth and sharing of innovation on areas of challenge and risk</p>
<p><b>Inflexible regulations</b></p>	<p><b>4. Inflexible regulations</b></p> <p><i>A focus on irrational distribution. This challenge emphasises the idea that ‘anything is preferable to enforcement’. It suggests nudging providers back to compliance – negotiate rather than dictate.</i></p> <p>The AMC has an opportunity to engage in further process improvement and policy development as well as stakeholder engagement to ensure the flexibility and responsiveness of its regulatory functions. This discussion paper sets out eight</p>	<p>Process Improvement</p> <p>Policy development</p> <p>Thought Leadership – Strategy and Research,</p> <p>Workshops and Events</p> <p>Sharing Good Practice</p> <p>Communities of Practice Support</p>



	key strategies for change which focus on support and compliance through negotiation rather than dictate.	Stakeholder Engagement
<b>Out-of-date regulation</b>	<p><b>5. Out-of-date regulations</b></p> <p><i>Unnecessary rules are slow to go and new rules to address new risks are slow in coming.</i></p> <p>The AMC has an opportunity to further develop its project management framework, engage in process improvement and policy development, as well as, communication to ensure timely delivery of its regulatory functions.</p> <p>The model of a cross curriculum capability framework (rather than extended rollout from medical school &gt; specialist training and CPD) proposed for adoption in the digital capability project, provides a model of curricula change. The advantage of this model it is it streamline the dispersion of innovation across the sector. It also presents the opportunity to build common foundational capabilities in digital health across the continuum. Such a model can also be applied to other areas of health reform.</p>	Project Management Process Improvement Policy Development Communication Education Support and Communities of Practice
<b>“Right Touch” regulatory techniques</b>	<p><b>6. Calls for alternative “right touch” regulatory techniques</b></p> <p><i>Means understanding the problem before jumping to the solution. It makes the level of regulation proportionate to the level of risk to the public.</i></p> <p>The AMC’s accreditation methodology is a comprehensive review. It is considered to be best practice nationally and internationally. The AMC has an opportunity to map the “burden of assessment” and impacts on stakeholders and systems by undertaking a review of the accreditation process. This ensures that any changes made to the process also complies with world standards, so that the AMC does not lose its standing with the World Federation of Medical Education (WFME).</p> <p>A challenge is the introduction of new standards and requirements, i.e. digital health in medicine within accreditation in a context where medical education providers are change tired and with resources committed to maintaining business as usual activity.</p> <p>Combining accreditation activity with stakeholder management activity, workshops and communities of practice, fosters innovation and trust as well as provides support rather than burden on providers</p>	Process Improvement Accreditation Review – Process Improvement and streamlining of methodology system-wide Capability Framework Development Support on educational models and approaches Stakeholder management and engagement Good Practice Guidelines and Communities of Practice Activities



<b>Demonstration of results</b>	<p><b>1. Demonstration of results.</b></p> <p><i>A need to demonstrate regulator effectiveness.</i></p> <p>The analysis of impacts is important to demonstrate evidence of outcomes and value. It will be vital to build a model of how impact can be analysed into the digital capability framework. (See section on assessment and measurement of impact in this discussion paper for further information.)</p> <p>There is an opportunity for the AMC to undertake a longitudinal study of impacts of accreditation on risk mitigation, efficiencies and innovation.</p>	<p>Research into impacts of Accreditation System-wide</p> <p>Outcome and Impact focused Evaluation</p>
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This research has been drawn on to create the eight levers of change at the AMC and its partners' disposal to bring about change in health reform across the sector, which are discussed in the next section of this paper.

# Levers for Change, Eight Key Areas of Collaboration in Health Reform

*In this section, we explore the eight levers for change and areas of collaboration in health reform and use building a digitally capable medical workforce as an illustrative case. This section is followed by sections which focus on each of these eight key action areas with an explanation of the current and future state, and recommendations for future action.*

The AMC and its partners have eight main levers of change to bring about workforce change:

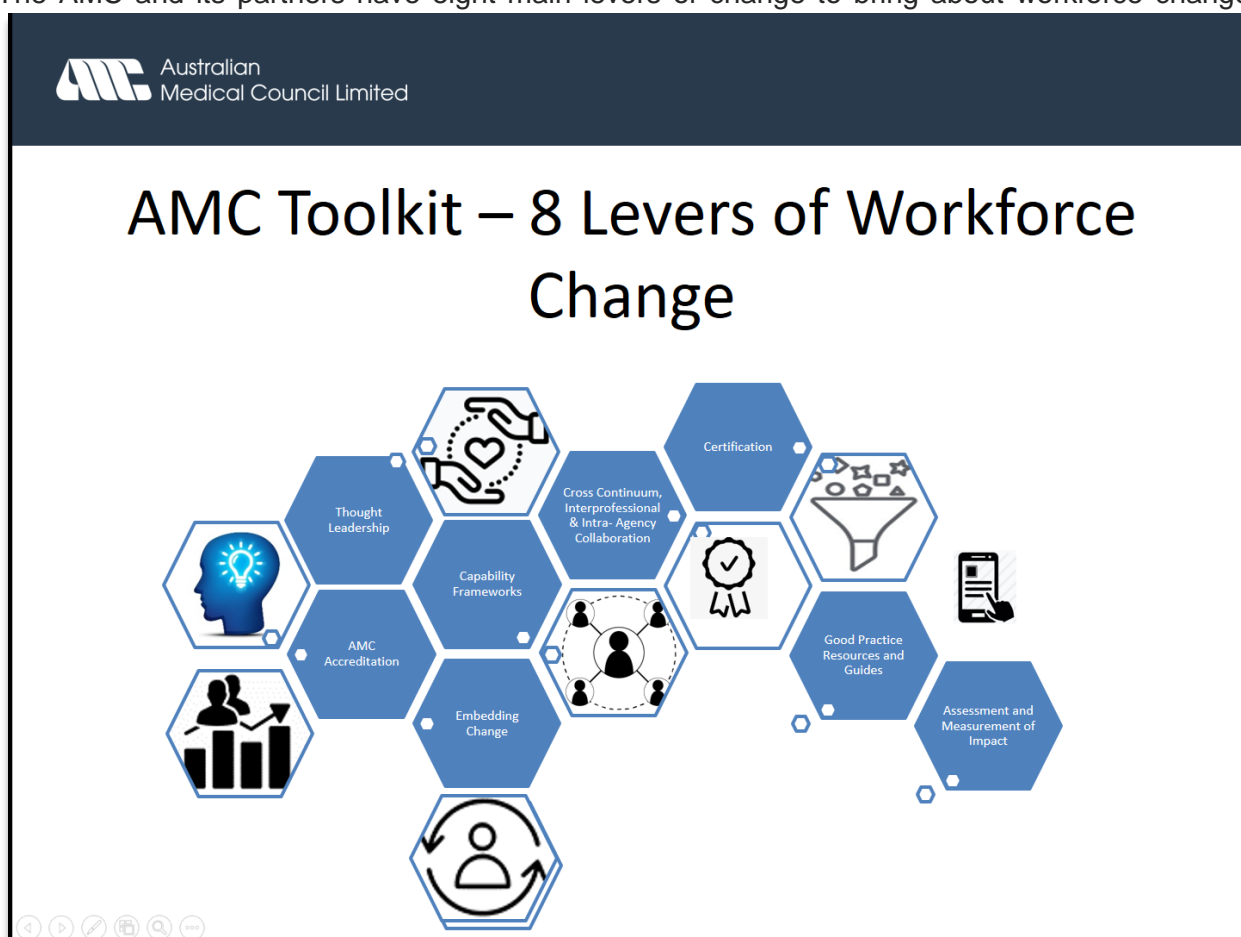


Figure 1: AMC Toolkit – 8 Levers of Workforce Change and Health Reform

# 1. Thought Leadership

*In this section, we define thought leadership and how the AMC and its partners can use this as a lever to align its focus more firmly within the Australian national health reform agenda. In structuring our discussion of this lever we focus on defining thought leadership and setting out some future opportunities of how the AMC and its partners could use this lever to build a digitally capable medical workforce. We conclude the section with some recommendations for future action.*



**Thought Leadership** is vital to help change medical education and practice through the development of evidence based research, strategy and community of practice activities and events. Importantly, thought leadership is framed as a collective activity with the fostering of communities of practice and champions of change across the health sector and medical education continuum, rather than thought being led exclusively by a few learned experts. This will involve the need to collaborate with stakeholders on research concerning AI and ethics in the health sector and broadly of the Impact of Future Technology Disruption on Workforce Change and Development in Health, Education and Medicine. In addition, we will explore patient rights perspective and legal implications of digital health. We will also collaborate with our partners regarding horizon series discussion papers aligned with health reform priorities, research papers, and book chapters. This partnership will jointly conduct workshops, community of practice support and conference events.

## Future Opportunities

### Integrating digital workforce education within the broader platform of change and reform in health

Key to the success of the AMC and its partners in providing thought leadership in building the digital capability of the Australian and New Zealand workforce, will be the ability to support the health system and education providers to undertake some tactical measures to scale up how it understands the key issues and evidence impacting good practice and the parameters of change for the profession.

The [National Strategy for Digital Health](#) and [Framework for Action 2018 – 2022](#) sets out a blueprint for digital health in Australia.

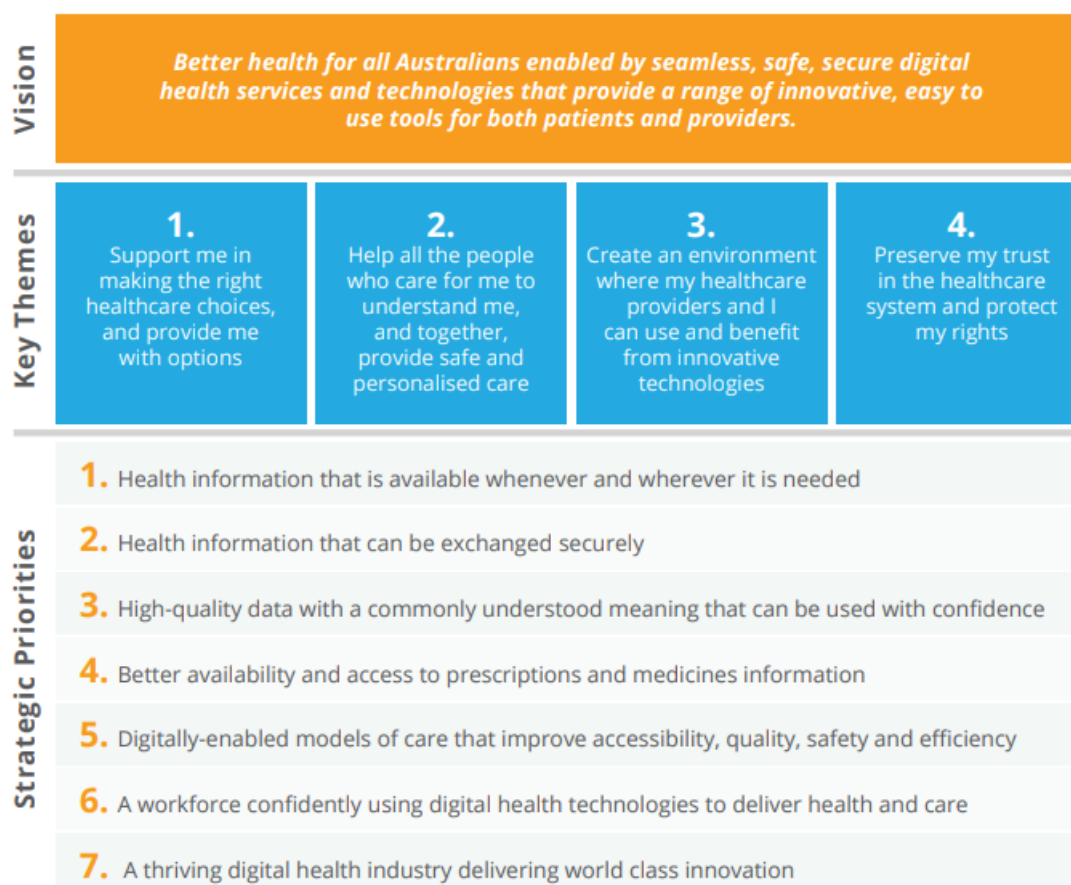


Figure 2: Vision, Key Themes and Strategic Priorities of the National Digital Health Strategy

Workforce and Education is one of the seven pillars of the Framework for Action to take the strategy forward. The Framework for Action focuses on the overarching goal of developing capabilities to deliver better health and care outcomes. This is designed to be achieved through three key goals.

1. Supporting adoption by the health workforce
2. Digital health embedded in training
3. Digital health national standards and accreditation.

The [National Digital Workforce and Education Roadmap](#) 2020 (Figure 3 - overleaf) sets out a clear strategy for the workforce development required now to – 2027. This roadmap has at its centre three horizons which require workplace changes and skills development. These horizons focus on Horizon one: embedding safe, ethical use of systems of record; horizon 2: integrating new technologies and ways of working; and horizon 3: digital health transformation. The capability framework seeks to align to this strategic platform to support the required change for medical professionals in Australia and New Zealand.

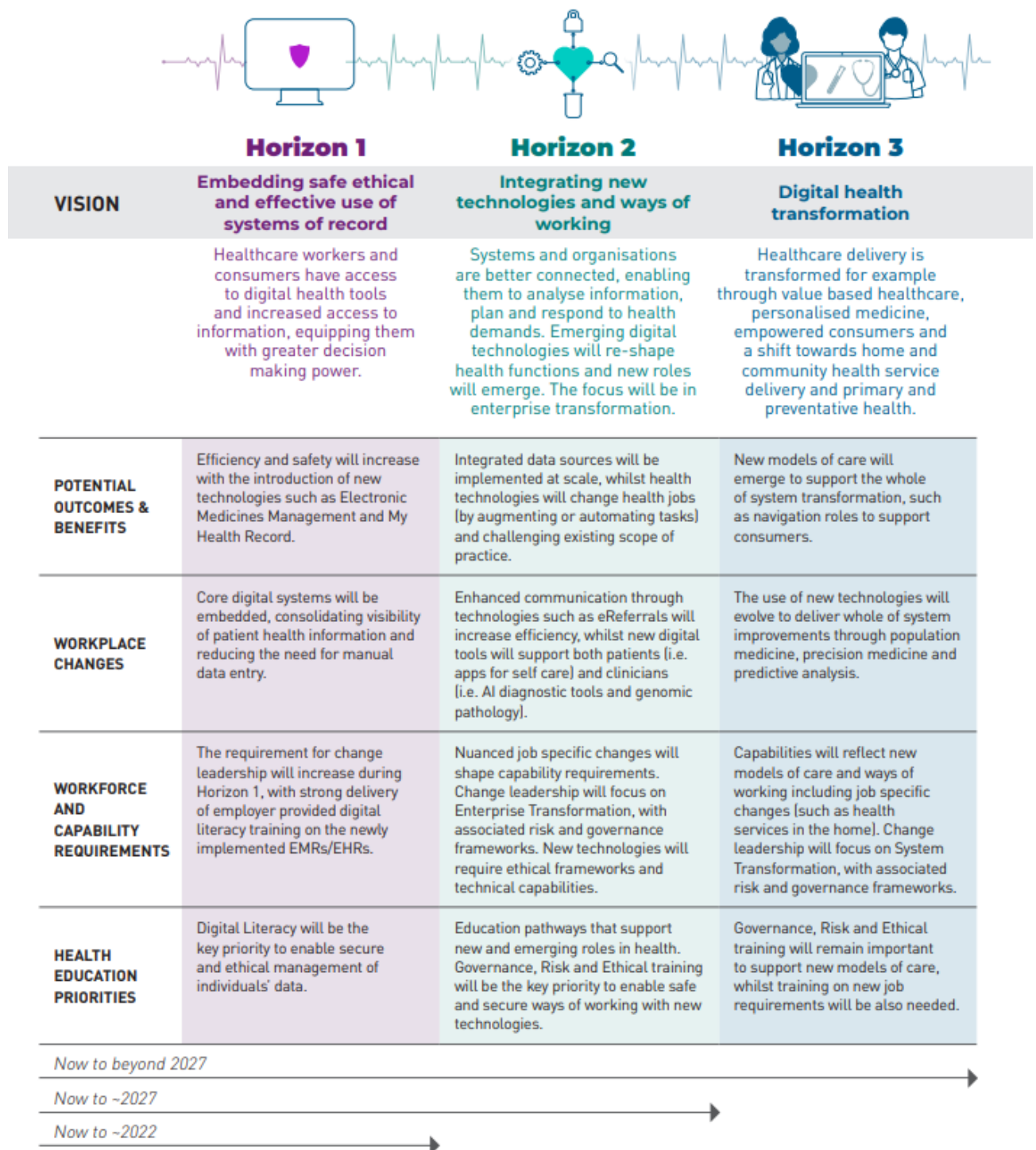


Figure 3: National Digital Health and Workforce Roadmap (2020)

The AMC has also lead thought leadership work related to digital health in medicine. As an example of thought leadership in AI and Ethics – key thought leadership themes for exploration with the medical profession are set out Figure 4 below.

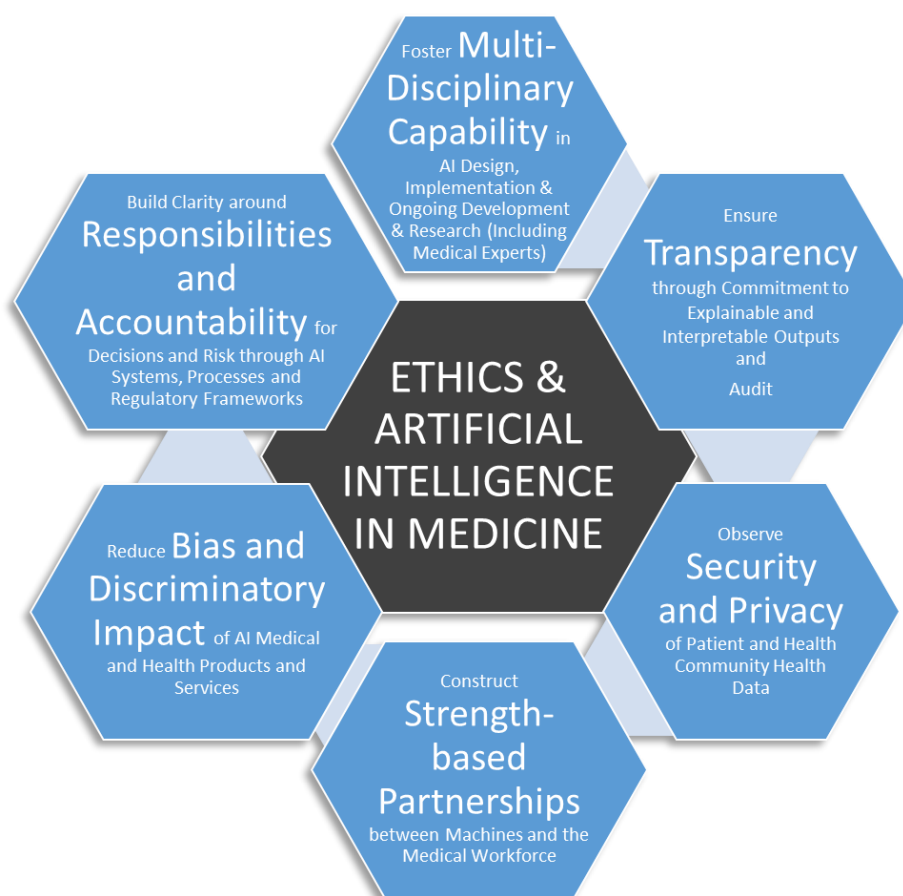


Figure 4: Ethics and Artificial Intelligence in Medicine

Key Themes	Future Focus
<b>Multi-Disciplinary Capability</b>	<p><b>Foster multi-disciplinary capability in AI design, implementation and ongoing development and research</b></p> <p>AI development and research is being driven largely by large technology companies and experts. AI has multi-dimensional impacts. The forging of multi-disciplinary projects and opportunities for multi-disciplinary learning and education drawing on the expertise of a range of different professionals is central to the success of AI in health. To ensure that AI is fit for purpose in health, it is vital that health professionals are involved in such multi-disciplinary teams to inform the design, implementation and ongoing design and research related to AI in the health and related field.</p>
<b>Transparency</b>	<p><b>Ensure transparency through explainable and interpretable outputs and audit</b></p> <p>It is vital that in health we unpack the “black box” of AI modelling including data sets and assumptions on which health modelling are based. This is to ensure that there is no bias and discrimination which creeps into the design and implementation of AI decision support. This is important to ensure that the current inequities in health care are reduced rather than widened through progress and change.</p>
<b>Security and Privacy</b>	<p><b>Observe security and privacy of patient and health community health data</b></p>

	A key concern of digital innovation is data security and privacy.
<b>Strength-based Partnerships</b>	<p><b>Construct strength-based partnerships between machines and the medical workforce</b></p> <p>Increasingly, machines are taking more advanced roles in decision support. The power of machines is their access to huge databases and ability to outstrip the human brain in processing of this data to make an accurate determination. The impacts of such technologies are already changing the nature of many procedural medical specialties including dermatology and radiology through pattern recognition. Equally, robotics is significantly enhancing surgical practice. In medical practice, it will be vital for career progression and workforce effectiveness to anticipate and plan for technological change and for skills development to focus on effective use of these technologies and on the elements of practice which humanise care.</p>
<b>Bias and Discriminatory Impact</b>	<p><b>Reduce bias and discriminatory impact of AI medical and health products and services</b></p> <p>The datasets and analytics on which they are based may have bias and discriminatory impact built into them. It is important that these datasets and analytics are analysed from a cultural safety perspective. We need to safeguard AI in medicine against such effects which could negatively impact health outcomes and experiences of marginalised and vulnerable groups.</p>
<b>Responsibilities and Accountability</b>	<p><b>Build clarity around responsibilities and accountability for decisions and risk through AI systems, processes and regulatory frameworks</b></p> <p>Clear governance frameworks around AI systems, processes and outcomes is vital to ensure that responsibilities and accountabilities for decisions and risks are identified and managed effectively.</p>

A further key message of thought leadership related to building a digitally capable medical workforce is the need to support a shift from technology being seen as separate from work in health i.e. eHealth to integral to how practitioners conceptualise and do their practice. A key method by which to attain this is goal is to integrate capability development into medical education approaches for all generations of doctors.



## Digital Capabilities and Health Reform

Drawing on the twelve key areas of health reform as set out in Appendix 2, the table below explores the main priorities within each areas of health reform and how digital health capabilities can support these areas of change. Whilst the table below does not by any way suggest that digital technologies is the only solution to these complex issues, it does present some opportunities.

Future System Priorities	Implications for Digital Capabilities and Workforce Development
<b>Sustainable medical work practices and cultures</b>	<ul style="list-style-type: none"> <li>• <b>Doctor wellbeing</b></li> <li>• <b>Effective leadership and clear roles</b></li> <li>• <b>Zero tolerance of bullying, harassment, and discrimination</b></li> <li>• <b>Safe working hours</b></li> <li>• <b>Promotion of flexible working models</b></li> <li>• <b>Work life balance</b></li> </ul> <p>It is vital that we ensure doctors work in a culture and environment which is safe. Old cultural norms of “heroic” self-harmful practices such as unsafe working hours need to be challenged as do education practices which are based on bullying, harassment and discrimination. Such behaviours have no place in modern day medical education and work practices.</p> <p>Digital capability of the workforce is essential to ensure that work is enabled through technology across the entire workforce and does not fall to more junior groups to complete all technology based administration or result in age divisions in the workforce. Lifelong learning is a key enabler to build understanding between groups within the medical workforce and ensure cross continuum competence in areas of change. Technology can also be useful to track fair practices, identify outliers and address problems. It can also enable digital communities of practice to share learnings and provide support.</p>
<b>Inter-professionalism and Inter-agency action for improved health outcomes and experiences</b>	<ul style="list-style-type: none"> <li>• <b>Multidisciplinary practice</b></li> <li>• <b>Better communication and trust between professionals</b></li> </ul> <p>Siloing of health professions is multi-factorial. It is embedded in tribalism, power and resources. New models of workplace culture, patient care, and learning need to be the norm; whereby, health practitioners work and learn together with their patients and commit to respecting their respective roles and joint responsibilities for patient care and professional wellbeing.</p> <p>Technology and increased digital capabilities across the health workforce can enable increased connection of disparate groups, sharing of the workload of technology based tasks in healthcare settings and improve health outcomes.</p> <p>Better approaches to inter-professionalism in health can be enabled through technology systems and workforce training focused on inter-professional respect and sharing as well as a commitment to vision for an improved workforce and openness to continuous learning.</p>
<b>People Centred Value based Care: Quality Improvement in Integration and Take Up</b>	<ul style="list-style-type: none"> <li>• <b>Tackle longstanding challenges in health with a focus on supporting vulnerable health groups and minimising effects of stigmatising health conditions and marginalised groups (rural and remote, disability, aged</b></li> </ul>

<p><b>of National and Global Health Value-Based Solutions to Service Delivery and Health Education to reduce Geographic mal-distribution, and inequalities in healthcare access</b></p>	<p>care, domestic violence, homelessness and unemployment, sexual abuse, sexual orientation and gender identity, addiction, refugees, human trafficking, mental health)</p> <ul style="list-style-type: none"> <li>• <b>Quality Improvement in Integration and Take Up of National and Global Health Value-Based Priorities in Service Delivery and Health Education</b></li> <li>• <b>Equity, humanity and dignity in health</b></li> </ul> <p>Structural inequalities are the personal, interpersonal, institutional and systemic drivers such as racism, sexism, classism, ableism, xenophobia and homophobia that create biases in policies and practices (Baciu et al 2017). Geographic mal-distribution and systematic differences in the opportunities leads to unfair and avoidable differences in health outcomes (Braveman 2006; WHO 2011).</p> <p>Future challenges and current inequities in health care and provision can be addressed through person-centred use of effective technologies in health.</p>
<p><b>Indigenous Health and Cultural Safety - closing the gap targets, growing the number of Aboriginal and Torres Strait Islander doctors and ensuring a culturally safe workforce</b></p>	<ul style="list-style-type: none"> <li>• <b>Closing the gap targets</b></li> <li>• <b>Growing the number of Aboriginal and Torres Strait Islander doctors and</b></li> <li>• <b>Ensuring a culturally safe workforce</b></li> </ul> <p>Key issues related to Aboriginal and Torres Strait Islanders, and digital technologies include a focus on data collection, quality and sovereignty, ensuring that bias in technology use does not further impact health inequities which Aboriginal and Torres Strait Islander Peoples encounter. Many Aboriginal and Torres Strait Islander peoples have used digital technologies in health care delivery. It will be important to draw on the expertise of these groups to ensure that lessons learnt are successfully integrated into the design and implementation of capability development approaches.</p>
<p><b>Service delivery, changing health needs and models of care with a focus on continuity of care, prevention and quality and safety improvements</b></p>	<ul style="list-style-type: none"> <li>• <b>Quality and safety</b></li> <li>• <b>Prevention</b></li> <li>• <b>Privacy, confidentiality balanced with importance of data sharing</b></li> <li>• <b>Security and Cybersecurity</b></li> <li>• <b>Secure Messaging</b></li> <li>• <b>Intra-operability</b></li> <li>• <b>Ethics</b></li> <li>• <b>Continuity of care and Person-centred care</b></li> <li>• <b>Health literacy, including digital health literacy</b></li> <li>• <b>Clinical Governance</b></li> </ul> <p>Central to Quality Service Delivery focused on community needs is safe, quality data use and secure systems. Digital technology can improve transparency in healthcare data and sharing of health information. A significant challenge is how to transition the health community from paper-based to digitally enabled health record systems which are accessible to all; whilst ensuring records are clinically meaningful.</p> <p>Whilst privacy and confidentiality of patient data is fundamental, including knowledge and understanding of relevant legislation and regulation and how this is best implemented in practice,</p>

	<p>equally important are the building of efficient and open systems which facilitate the sharing of health information with patients, across systems and inter-professionally. Privacy and confidentiality needs to be balanced appropriately with data sharing so that research, innovation in health and quality patient care are not compromised.</p> <p>Security and cybersecurity awareness and understanding is essential for safeguarding system integrity, and professional and public confidence.. Equally, secure messaging decreases the reliance on insecure fax messaging.</p> <p>Intra-operability is the mechanism where otherwise incompatible systems can communicate with each other through internationally recognised standards.</p> <p>New technologies bring into focus new ethical dilemmas and questions which need to be thoughtfully worked at national, practice/organisational and individual levels.</p> <p>The health literacy of many Australians can be improved and enabled through responsible use of digital health technologies. Health professionals have a role in supporting their patients to take an interest in and responsibility for managing their own health.</p> <p>Clinical governance is the set of relationships and responsibilities established by a health service organisation between its governing body, executive, clinicians, patients and consumers, to deliver safe, quality health care. It ensures that the community and health service organisations can be confident that systems are in place to deliver safe, high-quality health care and continuously improve services. Clinical governance is an integrated component of corporate governance of health service organisations. It ensures that everyone - from frontline clinicians to managers and members of governing bodies, such as boards - is accountable to patients and the community for assuring the delivery of health services that are safe, effective, high quality and continuously improving.</p>
<p><b>Innovations in Medical Education</b></p>	<ul style="list-style-type: none"> <li>• <b>Medical Education and Health Reform</b></li> <li>• <b>Medical Education and Capability and Workforce Development</b></li> <li>• <b>Medical Education and Teaching and Learning</b></li> <li>• <b>Medical Education and Assessment and Measurement of Impact</b></li> </ul> <p>Central to innovation in medical education is its alignment with health reform priorities and ability to keep pace with change to ensure that medical doctors are prepared for future workforce challenges. Key to innovation in medical education is to ensure that all components of teaching and learning cycle are up-to-date, and are comprehensive and aligned including: capability development, teaching and learning, assessment and measurement of impact. There is a current identified gap in the integration of digital capabilities into medical education curricula and the support of teaching and learning, and assessment practices through leveraging technology usage. The AMC has a key role to play in supporting medical education providers across the continuum to make these changes to their curricula and delivery mechanisms.</p>

<b>Emergency Response and Regeneration</b>	<ul style="list-style-type: none"> <li>• <b>Emergency preparedness</b></li> <li>• <b>Emergency response and regeneration</b></li> </ul> <p>Emergency preparedness is central to good health management. Emergencies include infectious diseases and food safety threats; natural disasters and severe weather, chemical and radiation emergencies and mental health impacts. Technology and digital workforce development is central to emergency preparedness, response and regeneration.</p>
<b>Environmental Impacts and Sustainability in Health</b>	<ul style="list-style-type: none"> <li>• <b>Environmental Impacts and Health Practices</b></li> <li>• <b>Environmental Impacts and Medical Education</b></li> <li>• <b>Environmental Impacts and Accreditation</b></li> </ul> <p>A global UN survey to determine the issues dominating the future identified sustainable environmental development as the preeminent issue. The report notes, 'Never before has world opinion been so united on a single goal as it is on achieving sustainable development'. The current trend in our consumption of the earth's resources is unsustainable and is creating major environmental problems. Climate change, resource depletion, loss of biodiversity, and air pollution have a major impact on many citizens and the earth, and we need to change our current behaviour. Our present use of the earth's finite resources cannot be maintained. We need to move to sustainable development, which 'meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland, 1987, p. 8). [extract Watson, R.T. (ed.) Green Is: Building Sustainable Business Practices.]</p> <p>Increasingly, there is a recognition that man-made <b>environmental change</b> is impacting our planet (<a href="https://climate.nasa.gov/evidence/">https://climate.nasa.gov/evidence/</a>). Health provision has a significant impact on the environment. Core to workforce development in health is the need to learn more about <b>sustainable health practices</b> to reduce the waste and environmental footprint of health. Equally, 'conserving the earth's ecosystem is a precondition for economic and social development, including good health' (WHO 2015).</p> <p>Environmental factors include 'all the physical, chemical and biological factors external to a person, and all the related factors impacting behaviours... targeted towards preventing disease and creating health supportive environments (including clean air and water, healthy workplaces, safe houses, community spaces and roads and managing climate change). (Bircher and Kuruvilla Journal of Public Health Policy 2014.)</p> <p>It is vital that the AMC create standards for medical education providers to commit to sustainable environmental health practices and to reduce the environmental footprint of health practices. Digital advancement provides solutions as well as further challenges to such aims.</p>
<b>Doctor readiness in a changing world – lifelong learning for lifelong health</b>	<ul style="list-style-type: none"> <li>• <b>Systems, practice/organisation and individual capabilities required in a digital age</b></li> </ul> <p>National and local efforts need to be focused on multi-level change impacting improved systems, practice/organisations and</p>

	the learning of new capabilities to realise the benefits and requirements of new digitally enabled healthcare.
<b>Medical Workforce Immigration and Domestic Workforce Supply – over and under supply of specialties, balance of generalist and sub specialists, change and future workforce needs and medical workforce diversity, mix and distribution</b>	<ul style="list-style-type: none"> <li>• <b>Over and Under Supply of Specialists</b></li> <li>• <b>Balance of Generalists and Sub-specialists</b></li> <li>• <b>Change and Future Workforce Needs</b></li> <li>• <b>Medical Workforce Diversity, Mix and Distribution</b></li> </ul> <p>There is much research into the over- and undersupply of specialists as well as papers on generalism and health needs in in both rural and remote settings.</p> <p>The AMC has an opportunity to help bring these various issues together to help advise on medical workforce supply as well as to reflect on this data and trends. Central to this analysis is use technology based datasets and consider the impact of technology on the medical workforce.</p>
<b>Business and Financial Modelling for a Sustainable Future in Medical Education and Accreditation</b>	<ul style="list-style-type: none"> <li>• <b>Sustainable Business Models in Medical Education</b></li> <li>• <b>Sustainable Business Models for Accreditation</b></li> </ul> <p>The maintenance of business as usual activity and management of future needs and curricula change is complex.</p> <p>The AMC is well placed to do research into financial modelling for sustainable future in medical education as well as to use this data to ensure the sustainability of its own business. Central to this analysis is use technology based datasets and to consider the impact of technology on financial modelling for sustainable medical education and accreditation.</p>

These priorities are potentially a huge burden and many providers may say that it is outside their remit and the role of the system. A challenge will be to provide a palatable model to gain buy-in from medical education providers and other stakeholders of health to foster such change. The other levers of change discussed in this paper provide opportunities for the AMC and its partners to support medical education providers and other key groups to collaborate to make the required step changes in these areas.

## Recommendations

### 1. Thought Leadership: That the AMC and its partners:

- a) **Digital Health** Continue thought leadership work in digital health in medicine
- b) **Other Health Reforms** Use this horizon paper and models developed through the Digital Health in Medicine Project to engage in thought leadership activities for other health reform priorities
- c) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross continuum, interprofessional and inter-agency) to support the work of the AMC and its partners to engage in thought leadership in digital health in medicine and in other areas of health reform.



## 2. Cross Continuum, Interprofessional, & Inter-Agency Collaboration

*In this section, we focus on a definition of terms and future state analysis of cross continuum, Interprofessional and Inter-Agency Collaboration in digital health in medicine. We conclude the section with some recommendations for future action.*



**Cross Continuum, Interprofessional and Inter-Agency Collaboration** Central to the value proposition and methods underpinning the AMC is cross continuum interprofessional and inter-Agency collaboration. This ensures that AMC products and approaches are fit for purpose and that communication with stakeholders as well as opportunities for input into design is achieved. This is also key in sharing expertise across programs and the health system and building relationships based on trust and respect.

**Cross Continuum, Interprofessional and Inter-Agency Collaboration in the context of developing capability in digital health in medicine and other areas of health reform**

This will involve the need to collaborate across the continuum, with other health professional groups and with other agencies which impact health outcomes and experiences. The partnership between the AMC and the Agency has reflected such broad collaborations across the sector and builds on the strong collaborative approach of the AMC which has built strong relationships with key stakeholders of health in undertaking its work over the last three decades.

### Future Opportunities

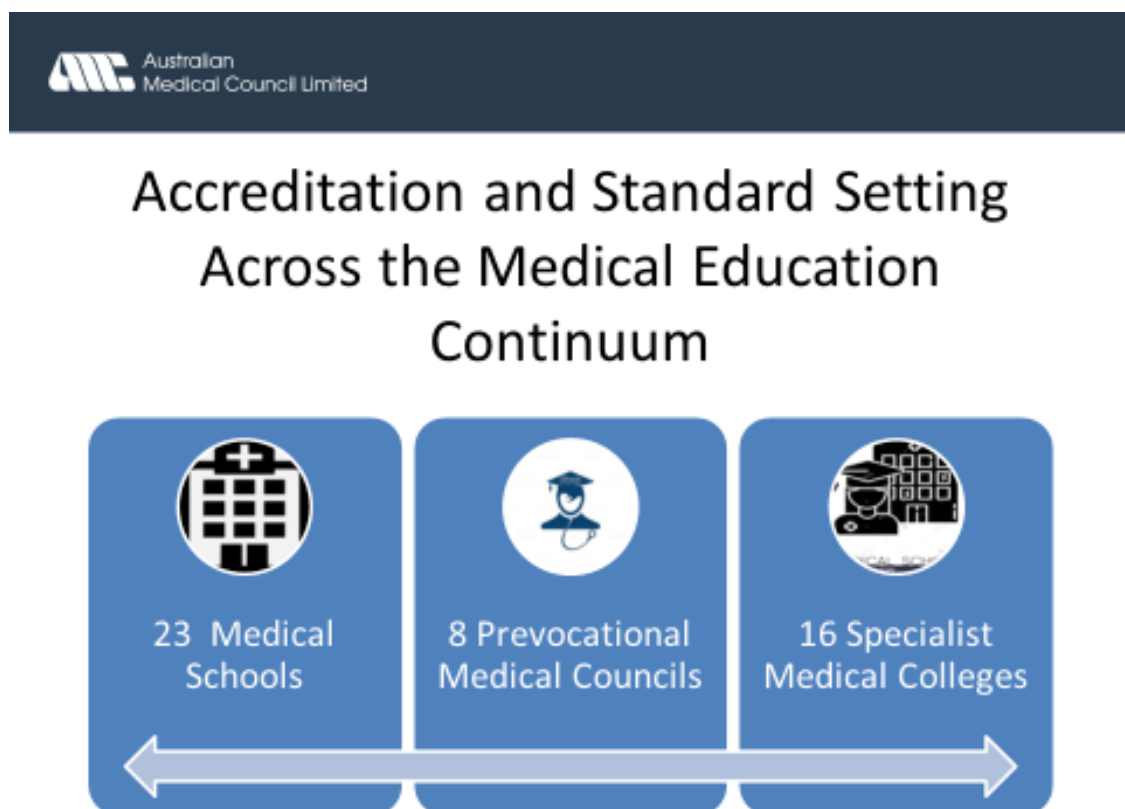


Figure 5: Cross Continuum Remit of AMC

The AMC collaborates with peak bodies of medical education: Council of Presidents of Medical Colleges (CPMC), Confederation of Medical Education Councils (CPMEC) and Medical Deans of Australia and New Zealand (MDANZ). It also collaborates with a broad range of partners and stakeholders of medical education including Aboriginal and Torres Strait Islander Groups, Consumer Organisations and all jurisdictional and Health Departments of the Australian Commonwealth Government. In collaboration with these key groups, it consults on its key initiatives to ensure that approaches are fit for purpose.

A further AMC priority is inter-professionalism. The AMC recognises the shared learning and value of **inter-professional collaboration**. In 2015, in collaboration with other health professions accreditation councils, the AMC formed the Health Professions Accreditation Forum (the Forum). In its position statement (2015), it acknowledges that ‘multidisciplinary team care is a key feature of contemporary models of healthcare and that effective teams improve healthcare. It is this collaborative feature of many existing and emerging models of clinical practice that is driving the need to educate and train future health professionals to work more collaboratively across professions in the interest of better patient safety and care’.

A key purpose of this forum is to share a common understanding of the definition and need for interprofessionalism as well as agreement on common interprofessional learning competencies to be integrated across the programs of study of Forum members. [Extract set out below].

***Interprofessional learning competencies***

*On completion of their program of study, graduates of any professional entry level healthcare degree will be able to:*

- *explain interprofessional practice to patients, clients, families and other professionals*
- *describe the areas of practice of other health professions*
- *express professional opinions competently, confidently, and respectfully avoiding discipline specific language*
- *plan patient/client care goals and priorities with involvement of other health professionals*
- *identify opportunities to enhance the care of patients/clients through the involvement of other health professionals*
- *recognise and resolve disagreements in relation to patient care that arise from different disciplinary perspectives*
- *critically evaluate protocols and practices in relation to interprofessional practice*
- *give timely, sensitive, instructive feedback to colleagues from other professions, and respond respectfully to feedback from these colleagues.*

*Figure 6: Interprofessional Learning Competencies [Extract Position Statement Health Professions Accreditation Councils’ Forum 2015]*

The AMC, in partnership with other accreditation council members of the forum, have collaborated on creation of a number of successful conferences and events to foster inter-professional learning in healthcare. A standout event was the 2015 workshop – Collaborating for Patient care – Interprofessional Learning for Interprofessional Practice which was facilitated by Professor Kim Snowball in Melbourne. In 2020, the HPAC conducted a survey to inform its strategic plan 2020 – 2023 set out in figure 7 below. This strategic plan will inform future directions of the forum.





HEALTH  
PROFESSIONS  
ACCREDITATION  
COLLABORATIVE  
FORUM  
Australia's accreditation authorities  
for regulated health professions

# STRATEGIC PLAN 2020 - 2023

## Our Vision

Better health outcomes through high quality accreditation and assessment services for all regulated health professions within Australia

## Our Purpose

We work collaboratively with our member organisations and other stakeholders to improve the quality, efficiency and effectiveness of accreditation and assessment functions of the regulated health professions for the benefit of the community

1 LEADERSHIP	2 EFFECTIVENESS AND EFFICIENCY	3 INNOVATION	4 STAKEHOLDER ENGAGEMENT
<i>Lead collaborative work with member accreditation authorities and other stakeholders to promote and improve accreditation and assessment services in the regulated health professions</i>	<i>Utilise our expertise to improve the quality and value of accreditation services for the benefit of the community</i>	<i>Challenge the present and shape the future to lead and promote best practice and continuous improvement in the work of member accreditation authorities</i>	<i>Proactively engage with our key stakeholders to optimise the benefits of a collaborative approach to addressing issues of common interest</i>
Key actions	Key actions	Key actions	Key actions
i. Lead the development of cross profession standards and policies	iv. Address duplication in accreditation systems with key external partners,	vii. Identify and develop new ways of working that reflect the developments in the professions that we regulate	x. Develop a communication strategy to increase external stakeholder awareness of the activities of the Forum and to improve visibility to external stakeholders of the 'position and authority' of the Forum
ii. Lead cultural safety initiatives being embedded in accreditation standards for all regulated health professions	v. Develop and apply meaningful performance indicators and data sets to support continuous quality improvement	viii. Identify areas for, and undertake, research on trends in accreditation and assessment practices to inform future Forum work	xi. Develop a preferred Forum model for engaging with and reporting to AHPRA/National Boards
iii. Lead new initiatives to identify and disseminate best practice across a range of accreditation and assessment activities, including: • IPE • Safe Prescribing • Accreditation Team Training	vi. Agree a governance model that is fit for purpose in establishing the Forum as the collective expert voice on accreditation and assessment services	ix. Create a Technology & Innovation sub-committee to identify areas where new technology will impact on accreditation and assessment practices	xii. Develop and agree consultation processes to ensure involvement of key external stakeholders in Forum activities

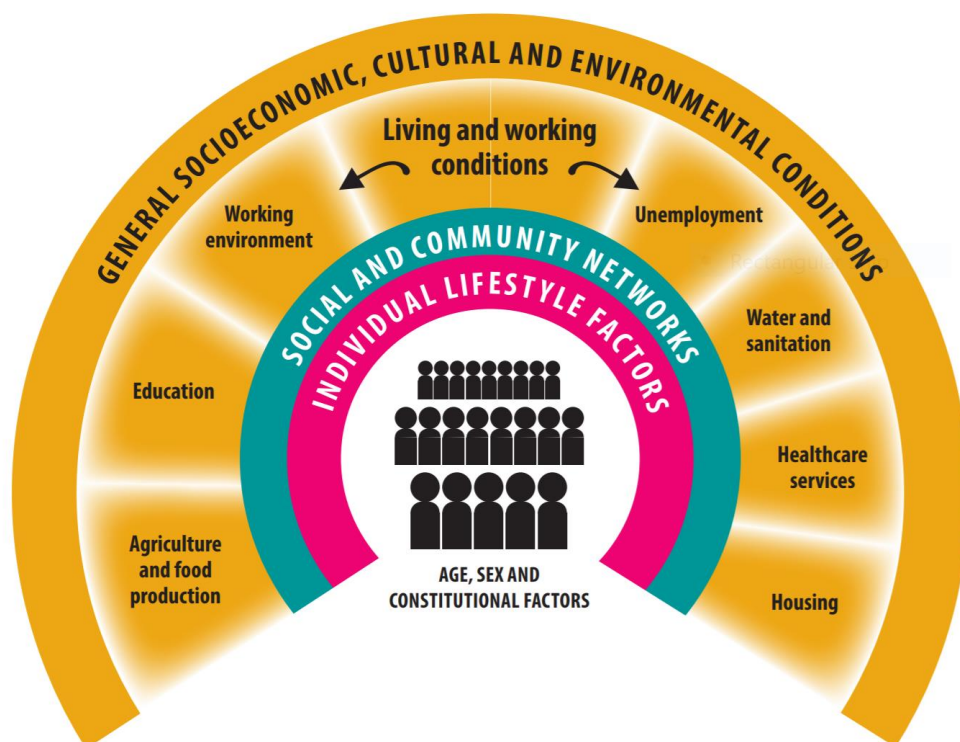
Assessment: the examination of individuals (domestic and/or overseas trained) as a regulated health profession requirement; only some Forum members carry out this function.

Figure 7: Strategic Plan 2020 – 2023 Health Professions Accreditation Collaborative Forum

The AMC seeks to forge stronger inter-professional and inter-agency partnerships to better consolidate its health reform program and support of improved health workforce performance to produce downstream positives impact on the health outcomes and experiences of the Australian health community.

**Inter-agency action** (WHO 2015) means less tribalism and siloed practice in health [and health education] including the removal of cultural and systemic barriers, which have traditionally hampered collaboration and innovation in health (Weller, J. 2012). It also means shifts in power dynamics in health with an increased valuing of the voice and perspectives of the patient and family, as well as, contribution of various health worker knowledge-bases underpinning good practice in health (McDonald, J. Jayasuriya, R. and Fort Harris, M. 2012). Core to achievement of improvements in health workforce performance is the acknowledgement that health is embedded, and closely related to the work of a range of other professions and agencies including: the social sector, employment and legal systems (WHO 2015). Increased **inter-agency action** means bigger picture thinking in healthcare practice concerning the determinants of health and the fostering of relationships with experts in law, employment agencies, immigration, social services, disability, mental health and housing to foster better outcome for patients and their complex care needs.

At the core of workforce development with key stakeholders is ensuring that all doctors have a strong knowledge-base in the **individual, social and environmental determinants of health**. This acknowledges that reducing health inequities is based on the integration of individual factors (functional differences, cultural beliefs which can facilitate or constrain behavioural change) and social structural factors (poverty and its sequelae) (Forde and Raine Lancet 2008). It takes into account, 'the unequal distribution of power, income, goods and services globally and nationally, and the consequent unfairness in the immediate, visible circumstances of peoples lives' – their access to healthcare, schools, and education, their conditions of work and leisure, their homes, communities, towns or cities and their chances of leading a flourishing life.



Source: Dahlgren G and Whitehead M (1991) *Policies and strategies to promote social equity in health*. Stockholm, Institute of Future Studies.

Figure 8: The Main Determinants of Health (From *Health in All Policies – Training Manual WHO 2015*.)

The AMC will further develop methods for **co-designed interventions**, such as the model used in the Digital Health in the Medical Workforce Project and National Framework for Medical Internship which draw on expertise and good practice across health and related professions, focus on improving health outcomes and impacts (Donetto et al. 2015). This mind set maximises the AMC's

ability to shape systems and craft fit for purpose support based on the feedback of key stakeholders. Co-design posits that it is through collaborative efforts of people networks, locally, regionally and international, organised in regulatory bodies, consumers, employers, governments, professional societies, universities, technical and vocational schools that good practice solutions are derived.

The AMC will continue to work with its partners, peak bodies and other stakeholders of medicine. Increasingly, it is consolidating relationships of trust and collaborating in community of practice and thought leadership fora to achieve health reform and quality improvement across the continuum of medical education.

## Recommendations

2. **Cross Continuum, Interprofessional and Inter-agency Action:** That the AMC and its partners:
  - a) **Digital Health** Continue to work with partners and broader stakeholders across the continuum, inter-professionally and with inter-agency intent in the digital health in medicine space
  - b) **Other Health Reforms** Use this horizon paper and models developed through the Digital Health in Medicine Project to engage further stakeholders (cross the continuum, interprofessional and inter-agency) in activities for other health reform priorities
  - c) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross the continuum, interprofessional and inter-agency) with responsibilities for health reform.

### 3. Capability Frameworks for Medicine

*In this section, we focus on defining capability frameworks and its future state analysis to embed digital health in medicine. We conclude the section with some recommendations for future action.*



**Capabilities Framework for Medicine** Capability frameworks are useful in that they help clarify the skills, knowledge, attitudes and tasks that doctors need to learn and competently perform as part of their professional practice. This will involve the need to identify and review professional and accreditation standards in digital health and education across the health workforce. This will involve drawing on national and international trends and frameworks (particularly medicine, nursing, pharmacy and allied health) and ensuring alignment with Safety and Quality Frameworks for the Australian health system. A vital feature will be to ensure that we do not “reinvent the wheel” and build on good current practice in developing implementable models of curricula change which medical education providers can integrate across the continuum into their curricula change programs. This work will also involve providing good practice examples of what core and foundational capabilities are, teaching and learning support, assessment and methods of measuring impact.

#### **Capability Frameworks in the context of developing capability in digital health in medicine and other areas of health reform**

This will involve the need to collaborate on the co-design of capability frameworks. An exemplar of such an approach is the development of the Digital Health in Medicine Capability Framework, which is currently in consultation phase.

### Future Opportunities

The AMC and its partners have collaborated to co-design a Capability Framework for Digital Health in Medicine. The framework was developed in consultation with an Advisory Group of experts in digital health and with broad representation across medical education providers and peak bodies in medical education.

[Replace link to consultation document with confirmed framework migrated to the AMC website: https://custom.cvent.com/D7D841CCCDFF414788A272CE06B96C74/files/d51b5c62c3724feab4f48769cec9acf2.pdf](https://custom.cvent.com/D7D841CCCDFF414788A272CE06B96C74/files/d51b5c62c3724feab4f48769cec9acf2.pdf)

The framework is –aligned with the [National Digital Health Workforce and Education Roadmap](#):

Importantly, the development of a capability framework is only part of the process. The Advisory Group and a broad range of participants of a forum which the AMC and Agency conducted with over 180 participants across the health sector highlighted a range of key implementation issues related to next steps to bring the capability framework in digital health to fruition. These key elements are consistent with good practice in curricula implementation. See lever 8 – Embedding Change for further information.

### Recommendations

#### **2. Capability Frameworks for Medicine:** That the AMC and its partners:

- a) **Digital Health** Continue to work with partners and broader stakeholders across the continuum, inter-professionally and with inter-agency intent in the digital health in medicine space to promote and implement the digital health in medicine capability framework in medicine
- b) **Other Health Reforms** Use this horizon paper and models developed through the Digital Health in Medicine Project to consider the development of capability frameworks for medicine for other health reform priorities

- c) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross the continuum, interprofessional and inter-agency) to support the work of the AMC and its partners to further develop and implement the digital health in medicine capability framework as well as the development of frameworks in other areas of health reform.

## 4. Good Practice Curated Collections and Support

*In this section, we focus on defining good practice curated collections and support as well as future state analysis of good practice in digital health education across the medical education continuum. We conclude the section with some recommendations for future action.*



### **Good Practice Curated Collections and Support**

Many good practice medical education resources exist online. The challenge is they can be developed by a range of different providers. They can also be of variable quality. Curated collections of good practice are useful in that they take the work out of individual professionals needing to search for good practice samples to help them learn what they need to know in a priority area. This involves the need to work with professionals and medical education providers to curate good practice examples of effective use of digital technologies in the delivery of medical education curricula and service provision. Curated collections are best selected based on rigorous quality criteria including content, accuracy, and education methods underpinned by peer review processes. Good practice guides can also consider how technologies can be used to support communities of practice and lifelong learning..

### **Good Practice Curated Collections and Support in the context of developing capability in digital health in medicine and other areas of health reform**

As part of the Digital Health in the Medical Workforce Project, the AMC has worked with education providers to create and share case studies of good medical practice. It has explored the literature to provide evidence of good practice of teaching and learning resources for digital health in medical education. The capability framework outlined in the previous section is also a strong contribution to the evidence and support for medical education providers. It will be important to review these resources over time to ensure that they remain current.

### **Future Opportunities**

The table below drawn from the WHO (2020) *Digital Education for Building Health Workforce Capacity* document is a useful starting point for exploration of modes of teaching and learning using technology which could be examined as part of this good practice review of digital education in medical education:



## DIGITAL EDUCATION MODALITY

## WORKING DEFINITIONS/DESCRIPTION

Offline digital education	An intervention that requires no internet or local area network connection and can be delivered through external media including CD-ROM, external hard disc and USB stick (17).
Online digital education	An intervention that requires the use of a “transmission control protocol” (TCP) and an “internet protocol” (IP) as a standard for the learning activities; also referred to as “online”, “web-based” or “networked” (15). It is important to note that some online digital education modalities could have offline applicability. An example of this is cloud-syncable courses offered offline through platforms such as the Moodle open-source learning management system.
Serious gaming and gamification (SGG)	A competitive activity in which students are given educational goals intended to promote knowledge acquisition. The games may either be designed to promote learning or the development of cognitive skills, or they may take the form of simulations allowing learners to practise their skills in a virtual environment (19). Although these concepts may be considered distinct, they are grouped together as a broader category for the purposes of this report. More specifically, gamification can be defined as “the application of the characteristics and benefits of games to real world processes or problems” and serious games can be defined as games designed specifically for the “serious” purpose of providing health professional education via a digital device.
Massive open online course (MOOC)	An online course that is designed for the participation of large numbers of geographically dispersed students.
Virtual reality (VR)	VR is a technology that allows the user to explore and manipulate computer-generated real or artificial three-dimensional (3D) multimedia sensory environments in real time. It allows for a first-person active learning experience through different levels of immersion, i.e. a perception of the digital world as real and the ability to interact with objects and/or perform a series of actions in this digital world (20).
Virtual patient (VP)	Interactive computer simulations of real-life clinical scenarios for the purpose of medical training, education or assessment (24).
Digital psychomotor skills trainers (DPST)	An intervention involving training procedural skills that includes mental and motor activities required to execute a manual task (25).
Mobile learning (m-learning)	Learning across multiple contexts, through social and content interactions, using portable, networked devices (26).

Figure 9: Digital Education Modalities (From WHO 2020 – Digital Education for Building Health Workforce Capacity.)

Some key thinking about learning to incorporate into a digital health approaches include:



**Evidence-based change to education over change for its own sake** whereby learning analytics of course outcomes and evidence from the literature and innovation is used to guide changes to the educational programs;



**Co-designed and curated resources over silo-ed provider driven development cycles** whereby key health organisations collaborate, co-design and share resources across systems and cross-promote each other’s digital health resources. This reduces duplication of efforts and wastage of resources, and leverages off the good work of others for the benefit of the learners, workforce systems and health communities globally;



**Bite size, just in time training over just in case learning** whereby learners access small, manageable chunks of learning and content tailored to their current learning and accessibility needs, to do their job better. Key to such resources are prompts for useful resources generated automatically through the ePlatform with AI decision support, aligned with stages and practice cycles to ensure learning is achieved in context, at an appropriate level of learning/complexity and fosters application of skills;



**Non-linear over linear** whereby learners are provided with clear signposts to guide them in their learning and to explore content in the order that works best for them;



**Community over individual processing of material** whereby courses include nudge strategies to shape behaviours. Learners engage with peers in their workplace and global online communities. In this way, they support each other to learn, build understandings of shared problems and raise global health benchmarks;





**Authentic and Interactive over context free, static delivery of material** whereby learners are provided with the opportunity to relate the content to their specific work so that learning is contextualised. Delivery of program material includes guides, videos, simulation, focus questions, activities and discussion. This is to ensure that learners actively engage with the course material and content and can apply the learning directly to improve their work and are supported to make improved decisions in situ;



**Recognition of credentials within open rather than closed education system** whereby learning is recognised across the system rather than bound by an individual education institution so that the learner has more control of their learning journey. The learning they undertake in diverse settings is recognised as valid and contributes to their career progression and workforce system improvements.

For some examples of case studies of how Australian Medical Education Providers are innovating to develop digital capabilities in their medical education programs see the link to case studies which were developed as part of the Digital Health in Medical Workforce Project:

[Case Studies](#) [Migrate to AMC website](#)

## Recommendations

### 4. Good Practice Curated Collections and Support: That the AMC and its partners:

- a) **Digital Health** Continue to work with partners and broader stakeholders across the continuum, inter-professionally and with inter-agency intent to create curated collections of good practice and support in digital health in medicine
- b) **Other Health Reforms** Engage further stakeholders (cross the continuum, interprofessional and inter-agency) in curating collections of good practice and support for other health reform priorities
- c) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross the continuum, interprofessional and inter-agency) to support the work of the AMC and its partners to created curated collections of good practice and support in digital health in medicine and in other areas of health reform.

## 5. Certification

*In this section of the paper, we focus on defining certification and future state analysis of certification in digital health in medicine. We conclude the section with some recommendations for future action.*



### 5. Certification

Certification in medical education can be thought of as on a continuum from formal to informal pathways (For definitions see Appendix 1):



Figure 10: Certification – model from formal to informal

It is vital that medical professionals gain certification for their learning. Certification can relate to new specialties create opportunities for creative careers in medicine as well as digital micro-credentialling and smaller bite size learning opportunities, which can help doctors to learn flexibility, maximises their mobility and ability to act responsively to disruptive change and new health reforms. This also involves the need to create the evidence and pathways for new specialties in medicine for approval from the Medical Board and Commonwealth, to provide advice and consultation feedback on creative careers in medicine required for future workforce planning for medically trained doctors, and to support medical education providers in creating streamlined training pathways aligned with workforce health needs and support models of lifelong learning, which provide learning in manageable certified “chunks” including short courses, micro-credentials and digital evidence of learning gained.

#### **Certification in the context of developing capability in digital health in medicine and other areas of health reform**

This will involve the need to collaborate on creating more streamlined and agile ways of providing and supporting certification in areas related to digital health capability development for all doctors and for specific technology based careers.

## Future Opportunities

Some of the challenges of the modern medical career is that governments have no appetite to form new specialties. This is due to the standard model of Specialist Programs which can be protracted, costly, and complex. Current government strategy and policy generally frames solutions to health workforce shortages in terms of task delegation, increased interprofessional collaboration, innovation in technology and generalism. In addition, Governments view medicine and medical education providers in the context of other professionals and employees within the labour market, who may be required to go through several career transitions and periods of retraining throughout their lifetime. Specialist medical pathways are seen to be untenable as a model for retraining given

length of training and cost. Equally, governments have had longstanding calls to the medical professions to explore methods by which specialist medical training can be shortened.

## Digital Professional Identities and Roles in Medicine

It is also acknowledged by governments that there are new skill development requirements, roles and careers being introduced. These skills, roles and careers represent new priorities for medical and health professionals aligned with the health reform agenda in Australian and internationally. Examples of new roles and careers in digital health are set out below – drawn from the National Digital Health Workforce and Education Roadmap. These new roles can be further mapped to EPAs. The point of this framework is that these are key functional roles that will be undertaken by a range of health workers within health contexts including doctors, nurses, midwives, pharmacists, and other allied health practitioners.

 <p><b>Patient, Consumer and Carer</b></p> <p>The Patient, Consumer and Carer profile expectations include maintaining health information, protecting the security and privacy of information, and adopting and advocating for new technologies that help manage their health.</p>	<ul style="list-style-type: none"> <li>• Digital Partner in My Health</li> <li>• The Digital Adopter and Lifelong Learner</li> <li>• The Quality Record Verifier</li> <li>• The Security and Privacy Enforcer</li> <li>• The Health Reformer</li> </ul>
 <p><b>Frontline Clinical</b></p> <p>The Frontline Clinical profile expectations include lifelong learning, adoption of digital technologies, understanding security and privacy, reliable and accurate record keeping, ensuring clinical safety with digital technologies, and advocating for consumer use of technology to empower them.</p>	<ul style="list-style-type: none"> <li>• The Digital Adopter and Lifelong Learner</li> <li>• The Information Analyser</li> <li>• The Quality Record Keeper</li> <li>• The Security and Privacy Protector</li> <li>• The Consumer Advocate</li> <li>• The Clinical Specialist</li> </ul>
 <p><b>Digital Champion</b></p> <p>The Digital Champion profile expectations include being a digital teacher and champion locally for a particular technology or system. The Digital Champion role may change depending on the digital technology and setting. Key to this role is the early digital adoption and change champion functions they play in the workplace.</p>	<ul style="list-style-type: none"> <li>• The Technical Teacher</li> <li>• The Digital Change Champion</li> <li>• The Early Adopter and Lifelong Learner</li> <li>• The Troubleshooter</li> <li>• The Health Reformer</li> <li>• The Quality Gatekeeper</li> <li>• The Ethics, Security and Privacy Champion</li> </ul>
 <p><b>Clinical and Technology Bridging</b></p> <p>The Clinical and Technology Bridging profile expectations include providing advice during the design and development of new digital technologies and systems, and leveraging clinical networks for user testing and adoption. This profile represents the clinical/health informatician.</p>	<ul style="list-style-type: none"> <li>• The Clinical Designer/Specification Advisor</li> <li>• The Clinical Information Analyser</li> <li>• The Risk and Governance Enforcer</li> <li>• The Digital Change Champion</li> <li>• The User Tester</li> <li>• The Problem Solver</li> <li>• The Health Reformer and Innovator</li> <li>• The Quality Controller</li> </ul>

Figure 11: Digital Roles in National Digital Health Workforce and Education Roadmap (2020) (continued overleaf).



Figure 12: Digital Roles in National Digital Health Workforce and Education Roadmap (2020) (continued).

This suggests that more flexible and responsive ways for lifelong learning in digital health needs to become a more prominent feature of medical careers. A caveat is that ‘flexible’ and ‘responsive’ does not compromise quality and rigor. This is important as quality medical training is paramount in delivering safe and quality healthcare and in benchmarking our health system and health workers with other systems and health professionals internationally. In conclusion, we need to develop better ways of certification for lifelong learning as our current models can provide information of limited use for learners, employers or regulator as to the skills gained or standardised level of responsibility the worker/learner can successfully perform to assist with mobility and transferability across the health system.

The AMC has a key role in working with other key stakeholders across the Australian and New Zealand health, higher education and vocational education systems to promote the creation of a recognition system that is interoperable with other agencies, regulators, employers and organizations to ensure learner achievement and recognition is meaningful, flexible, responsive to the pace of change in healthcare needs and portable around the globe.

Many lifelong learning certificates provide limited information about learning achieved, as the sample (figure 13) below shows:

## Scope and Purpose



Figure 13: Sample Certificate for Continuing Professional Development Recognition

What if we had a recognition system that was able to resolve these challenges?

**An Open Certification Framework is a collaborative effort of educational institutions or members of a professional community for mutual acceptance of lifelong learning recognition. Open signifies the collaborative nature of the process whereby the standards created for one agency may be adopted or adapted by another.**

### Key Elements

The literature defines open certification as:

- ❖ **Digital:** Enables credentials to be issued and transferred across the web and other digital exchanges
- ❖ **Outcomes Oriented:** Based on competencies and outcomes achieved rather than time served or points, credits or marks as measurement of the credential
- ❖ **Evidence-based:** Focused on evidence of learning, assessment and evaluation. It provides a more granular picture of learners needs, what they can do and impact on system goals
- ❖ **Stackable:** Based on a common framework, enabling courses combinations across learning priorities and providers, producing shared understandings of the capabilities, levels of attainment, and streamlined pathways into employment
- ❖ **Diverse Learning Experiences and Types Recognised:** Used to recognize formal and informal learning in accredited and non-accredited settings
- ❖ **Standardised:** Based on analytics, metadata and principles of interoperability, which allows clearer display, comparability and analysis of learning achievements and generates course catalogue in advice engine and the import of existing profiles from platforms such as LinkedIn
- ❖ **Secure:** Traceable, secure record of certification. This ensures integrity and authenticity of records, builds trust in the certification, and allows for greater personal control over distribution pathway. In the short term, this could be provided through technology solutions such as a QR Code and in the longer term, through Blockchain technologies.



# Future State: Open Digital Certifications

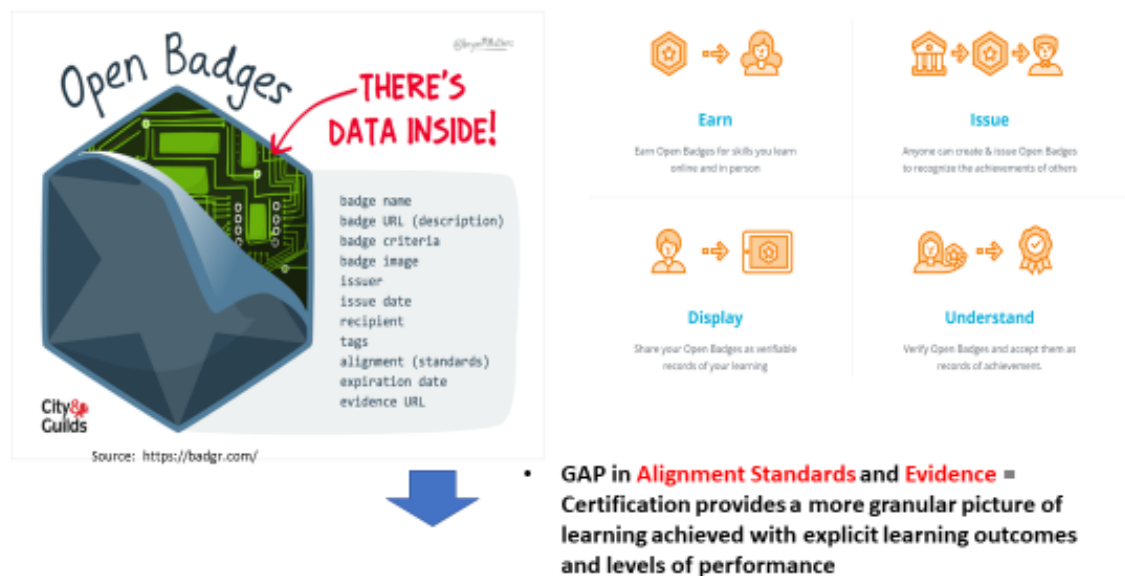


Figure 14: Visualisation of Open Badges [extract from Badgr]

Key to the success and standardisation of such a system is alignment with global learning levels.

## Learning Levels

Figure 15 sets out key stages proposed by the UNESCO. These stages are very similar to the model proposed in the section of this discussion paper on capabilities frameworks – see levels proposed by Stephenson (1999) and proposed for integration into the assessment of EPAs for Digital Health.

The certificate metadata displays learning tasks, outcomes as well as evidence of achievement based on a competency framework and standardised level descriptors.

1. "ACTIVITIES" OUTCOME STATEMENTS	
For information on the terms in bold, see <i>WRL Directory</i>	
STAGES	Individuals will be able to...
A	1 ... <b>carry out simple</b> or highly <b>structured activities</b> which do not require <b>knowledge</b> or <b>know-how</b> which is specific to the <b>field</b> of activity.
	2 ... <b>carry out familiar, structured activities</b> which require <b>basic knowledge</b> and <b>know-how</b> in the <b>field</b> .
B	1 ... <b>carry out routine technical activities</b> which are <b>straightforward</b> or clearly defined.
	2 ... <b>carry out or supervise non-routine technical activities</b> which need to be clarified and <b>planned</b> .
C	1 ... <b>carry out, manage or lead on complex</b> and/or <b>specialised activities</b> which need to be analysed and/or modified, and scoped and organised.
	2 ... <b>carry out, manage or lead on complex</b> and/or <b>specialised activities</b> which need to be analysed and re-interpreted or <b>reconfigured</b> .
D	1 ... <b>carry out, collaborate on, lead on, or direct strategic</b> or highly <b>specialised activities</b> , in or affecting a <b>field</b> or <b>organisation</b> , which require the use of <b>advanced knowledge</b> and <b>know-how</b> .
	2 ... <b>carry out, collaborate on, lead on, or oversee strategic</b> or highly <b>specialised activities</b> which are <b>critical</b> to a <b>field</b> or <b>organisation</b> and require the <b>creative</b> use of the most <b>advanced knowledge</b> and <b>know-how</b> .

Figure 15: UNESCO World Reference Levels (Extract)

## Horizon Certificate in Health Reform and Workforce Development

As part of the stage 3 curriculum development of the Digital Capability of the Australian Medical Workforce, the Commonwealth Government and AMC could work collaboratively with medical education and health providers in the development of a Horizon Medicine Certificate aligned with Health Reforms, which provides a stackable micro-credentialled lifelong learning certificate focused on priority areas of health change.

### Three Tiered Business Opportunity

<b>Commonwealth Government</b>	Share insights with other Government Departments on creation of a horizon certificate in healthcare reform which effectively distils priority workforce needs related to government priority area i.e. social determinants of health, strategic change and leadership in health, social responsibility in health, disability, aged care, Indigenous Health – closing the gap, environmental sustainability in health, public health management of health emergencies and outbreaks.
<b>AMC</b>	Develops the Educational Framework for Medicine and shares with Health sector.
<b>Education Providers</b>	Tenders to support development of associated educational resources and assessment and supported for implementation.

### Learning Model

Delivered in an App, the learning could be viewed on one's phone or tablet and include teaching and learning support, options for sign off of EPAs and digital badges for horizon micro-credential modules completed i.e. digital health.

Other modules could be offered in the future in other priority areas with further government partnerships including Aged care, disability, Indigenous Health, Environment Sustainability in Health, Managing Pandemics and so on.

The App could include an initial module on **Professional Identities in Disruptive Change in Health.**

Core to successful careers in disruptive environments is for health workers to help medical professionals build their portfolio of learning by reflecting on their professional identity and to stay abreast of change through commitment to ongoing learning.

The focus within professional learning on the creation of career maps, which combine past learnings and recognition of skills achieved so that learner are able to successfully transfer skills as well as future learning priorities, which focus on gaps, to ensure that they have a successful career and navigate change effectively:

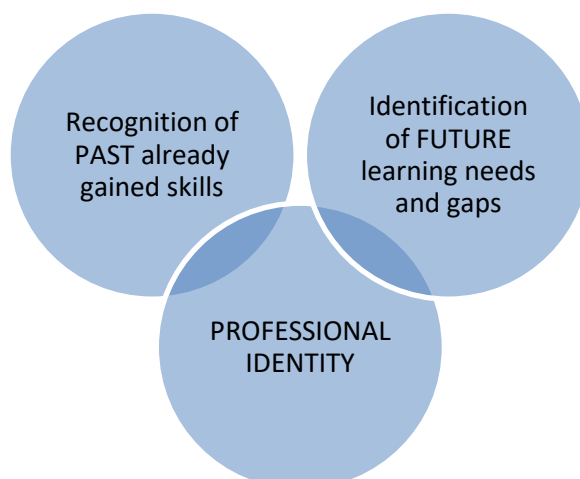


Figure 16: Professional Identity – Method to Recognise Skills and Future Learning Needs and Gaps



**Key questions which can help doctors shape their professional identity and explore the relevance of digital health to their future careers is to:**

- A.** Reflect on the core functional roles of new digital identities in health and **think about the skills you already have** – write down core capabilities you can transfer to digital health contexts and domains of learning, for which you can gain recognition of competence – demonstrated through portfolio, online and work-based assessment.
- B.** Reflect on the core functional roles of new digital identities in health and **think about your gaps and future learning needs** – write down core capabilities you can transfer to digital health contexts.
- C.** Think about the **evidence you have of your current skills** and document in professional portfolio – this can be combined through reflective writing with description and direct evidence of experiences achieved, work-based assessment and online assessment.
- D.** Think about the **gaps and future learning needs and identify the future learning** you can do to meet these gaps and EPAs to perform to demonstrate competence.

## **Recommendations**

### **5. Certification:** That the AMC and its partners:

- 1) **Digital Health** Continue to work with partners and broader stakeholders across the continuum, interprofessionally and with inter-agency intent to promote and foster models of certification underpinned by contemporary thinking.
- 2) **Other Health Reforms** Engage further stakeholders (cross the continuum, interprofessional and inter-agency) in promoting and fostering models of certification to support lifelong learning in other health reform priorities.
- 3) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross the continuum, interprofessional and inter-agency) to support the work of the AMC and its partners to refine models of certification in medicine.

## 6. Assessment and Measurement of Impact

*In this section, we focus on defining the importance of Assessment and Measurement of Impact as well as setting out future directions in these areas in the context of digital health in medicine. We conclude the section with some recommendations for future action.*



**Assessment and Measurement of Impact** Assessment is important because it provides vital information about competence of doctors. Measurement of Impact occurs at the broader program level with a focus on measuring the outcomes and impacts of change initiatives. Through its accreditation role the AMC plays a vital role to ensure the assessment methods of medical education providers are in line with current evidence-based good practice across the medical education continuum. Equally important is the need to develop better standards and methods of measurement of impact at an individual and system level of curricula change and planned outcomes. The measurement of impact is challenging and in need for further support. A further area of development for the AMC is to contribute to the collective evidence about how to use current and emerging technologies to deliver and measure good practice assessments as well as to ensure that digital capabilities are integrated into the assessment of doctors' performance. Furthermore, in its role in the design and delivery of assessment methods of International Medical Graduates (IMGs) and Assessment Pathways, the AMC demonstrates effective use of current and emerging technologies. A further area of development in IMG assessments is to ensure that the assessment of candidates' digital capabilities is integrated into assessment of their performance.

### **Assessment and Measurement of Impact in the context of developing capability in digital health in medicine and other areas of health reform**

As part of the Digital Health in the Medical Workforce Project, the AMC has highlighted the need for digital capabilities to be integrated into the assessment programs of medical education providers. It is also emphasised as part of the Digital Capability Framework that digital technologies can be used to further support good assessment processes. Examples are provided in this section of how the AMC is innovating in assessment processes through effective use of digital technologies.

## **Future Opportunities**

Assessment is the mechanism by which the ability of individual students/trainees to meet specific milestones of the training program and ultimately measures readiness for unsupervised practice. Assessment is also fundamentally a learning process in itself. It has long been recognised that assessment drives learning but increasingly assessment *for* learning is emphasised. Assessment should promote learning.

Measurement of Impact relates to the evaluation of the outcomes at an individual and system level.

The AMC has a core role in promotion and modelling of good practice in assessment and measurement of impact through:

- its accreditation function by which it sets and monitors the uptake of good practice assessment standards by Australian medical education providers across the continuum (medical schools, pre-vocational, vocational specialist Colleges and CPD)
- its work to develop and foster assessment practice improvement across the continuum of medical education
- modelling good practice in its role of assessment of IMGs.

This current state analysis of assessment and impact measurement innovations and trials using technology is focused on:

1. Assessment of Digital Capabilities
2. Digital Innovation in Delivery of Assessment and Support
3. Impact evaluation

### **Assessment across the health continuum of professions and stages of training**

Currently education providers across the medical education continuum are innovating in assessment. Most programs include work-based and formal examinations. It is fair to say that there is often not enough integration between the two in final decisions of fitness to graduate with the final examination being the main means of determination of graduation decisions. To counteract this challenge many medical education providers are exploring new frameworks and approaches to assessment – the most current thinking being Programmatic Assessment Schuwirth LWT, Van der Vleuten CPM. 2011)

Recently, there has been much emphasis across the continuum on delivering formal examinations online with some painful experiences, particularly with large institutions having technical problems, which have impacted negatively on trainee and supervisor confidence in medical training. Central to innovation across the continuum is the need for sharing of good practice and lessons learnt particularly in assessment design, contingency planning and communication when things go wrong.

#### *Assessment of Digital Capabilities*

The AMC does not specifically assess the use of technology nor mandates its use in the standards. However, with the prevalence of digital technology today, many education providers already incorporate its use to facilitate their educational and training programs. Uses may include providing online platforms to support communication and facilitate learning in various environments, digital or online methods to support tests and examination functions or recording information to accurately track a trainee or fellow's progress. The AMC's primary concern would be that the chosen means of technology used by education providers is fit for purpose to facilitate and support the objectives of its governance, curriculum, teaching and learning, assessment, communication between the provider, trainees and supervisor, continuing professional development and the availability of information for its students, trainees, fellows and the public.

#### *AMC Assessment of Digital Capabilities*

A review of the AMC Anthology of Medical Conditions (2003), the AMC text, which provides an integrated multi-disciplinary index of clinical conditions and presentations; guidelines for clinical problem solving and legal, ethical and organisational aspects of clinical medicine, shows that there is no listing of digital capabilities in this text. Furthermore, digital capabilities are not currently assessed as part of the AMC IMG assessment. This is not surprising, or inappropriate, given the current lack of integration of digital capabilities in the AMC graduate outcomes statements, to which the AMC Clinical exam is mapped.

#### *AMC Digital innovation in delivery of assessment and support*

Technology is key to the design processes of AMC exams, delivered in a purpose built examination centre – the National Test Centre (NTC), located in the CBD in Melbourne. Technology is being used to improve delivery of the AMC exams. Clients can tailor an examination to meet their requirements, with the addition of optional functionality:

- exam control system
- audio and video recording
- real time and remote observation
- digital marking
- digital exam content

As a secure facility, the focus of the AMC is on the protection of our candidates, clients and their information. For a full overview of the impressive technology based functionality of this centre. See the NTC website <https://ntc.org.au/technology/>

Currently the NTC is temporarily closed due to COVID-19 Pandemic restrictions. The AMC was well advanced on future plans for remote delivery of AMC Exams prior to the pandemic through its Remote Marking Project and has now further expanded its use of technology in the delivery of the AMC Clinical Project through its AMC Online Clinical Examination Project. The AMC Online Clinical Examination is planned to launch early in 2021.

### **Measurement of Impact**

The AMC seeks to measure the impact of training and accreditation process on medical education. One standout innovation in the measurement of impact is the Preparedness for Internship Survey. The survey is a joint effort between the AMC and the Medical Board of Australia, which aims to improve how medical schools prepare graduates for internship. Results from the survey are being used to drive improvements in medical school programs, and to inform changes to national standards and processes in both the medical school and prevocational training.

### **The Future of Assessment**

Newer thinking about assessment has also focused on the link between assessment and learning (Cilliers FJ, Schuwirth LWT, Adendorff HJ, et al. 2010; Cilliers FJ, Schuwirth LWT, Herman N, et al. 2012.) and feedback (Ericsson KA. 2007; Boud, D and Molloy, E 2012).

Innovations in digital health curricula provides an opportunity for improvements and sharing of best practice in assessment practices across health education programs. Programmatic assessment, which focuses on the assessment of multiple biopsies of trainee performance drawn from observation of learner practice in the workplace and formal assessments, provides a useful methodology for improvements in healthcare assessment.

### **Evaluation of Impact**

Impact data can be generated from surveys and longitudinal studies to ascertain training program innovation and patient and health community experiences and impacts. Evaluation techniques such as contribution analysis, and ethnographies can be used to gather qualitative data combined with quantitative data. The use of learning analytics and integration of the collection of data into curriculum design and technology delivery systems is paramount to contemporary evidence based measurement of impact:

# Measuring Impact

## STAGE 1 EVALUATION

### Pre Implementation: Key Performance Indicators

**Training Program Provider and System Uptake** is measured with reference to:

- **Self Evaluation** (medical education provider engagement in self evaluation to determine alignment of current curricula and future curricula plans with proposed framework of foundational digital capabilities in medicine)
- **Providers Short Term Uptake of Framework** (number of providers that identify gaps in current curricula and actively promote use of framework to their students and members)
- **Providers Longer Term Curricula Plans** (number of providers with gaps in current curricula related to digital health and stated plans of how to map and integrate Digital Capability Framework into Curricula Renewal of their existing programs)

## STAGE 2 EVALUATION

### During Implementation: Key Performance Indicators

**Medical Professional Uptake** is measured with reference to:

- **Self Evaluation, Supervision and Peer Assessment** (professionals engage in self assessment aligned with capabilities and EPAs – supervisors and peer assessors undertake observations and provide feedback on level of performance)
- **Participation** (number of professionals progressing with EPAs and participating in teaching and assessment programs or aligned capabilities and support in own curricula)
- **Program Completion** (number of professionals who have completed EPA 1-3 or aligned capabilities and support in own curricula)

## STAGE 3 EVALUATION

### Post Implementation: Key Performance Indicators

**Impact** is measured with reference to the six dimensions of impact evaluation on clinical practice and health system improvement from the perspective of learners, health system and patients and community:

- **Effectiveness** (*increased capability and change in behaviours of health workers & patients and carers – increased skills, attitudes and performance; curing patients at a better rate – reducing complications, reducing readmission, reducing emergency admission, preventing premature death, reducing disability, improving health and wellbeing*)
- **Efficiency of services** (improving health system functioning, using resources in best way, balancing costs and benefits)
- **Timeliness** (reducing waiting times, GPs or before surgery)
- **Patient quality and safety** (improved quality, better management of risk and reduced bias in care)
- **Patient-centredness** (as measured by patient satisfaction and outcomes)
- **Equity** (access to quality services and closing gap targets).

Evaluation Levels for Health Education (adapted from Belfield et al, 2001) WHO Impact Measures in Health and the GRASP Framework, Khalifa et al. 2019.

Figure 17: Measuring Impact

For a more detailed plan of how impact could be measured concerning integration of digital capabilities across the continuum see Appendix 2 which elaborates on the model set out in Figure 17 above.

## Recommendations

### 6. Assessment and Measurement of Impact: That the AMC and its partners:

- a) **Digital Health** Continue to work with partners and broader stakeholders across the continuum, inter-professionally and with inter-agency intent to support the development of effective assessment practices and measurement of impact in the digital health in medicine
- b) **Other Health Reforms** Engage further stakeholders (cross the continuum, interprofessional and inter-agency) in effective assessment practices and measurement of impact for other health reform priorities
- c) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross the continuum, interprofessional and inter-agency) to support the work of the AMC and its partners in fostering effective assessment practices and measurement of impact in digital health and other health reform priorities.

## 7. AMC Accreditation

*In this section, we focus on a definition of terms and future state analysis of AMC Accreditation in digital health in medicine. We conclude the section with some recommendations for future action.*



**AMC Accreditation** AMC accreditation is a major way to effect curricula change across the continuum in medical education. This involves the need to maximise levers of change in creation of a digitally capable future workforce and fostering of quality improvements to medical practice and provider support through accreditation processes. Design and implement an approach to review AMC accreditation standards, graduate outcome statements and AMC support to address incorporation of future change impacting the medical professions (including digital capabilities) for the continuum of medicine (medical schools, intern training and Colleges – vocational specialist training and lifelong learning).

### **Accreditation in the context of developing capability in digital health in medicine and other areas of health reform**

As part of the AMC and Agency partnership project in Digital Health in Medicine recommendations have been made as part of the consultation process for the AMC Medical Standards Accreditation Review (currently in consultation).

### Future State

Over the past three decades, as the standard setting body and accreditation agency for medical education in Australia and New Zealand, the AMC has played a thought leadership role within the region. The AMC has developed standards collaboratively with medical education providers and other stakeholders to articulate the knowledge, skills and professional qualities medical graduates, interns and specialists need to practice safely and competently, their members navigate change and remain current in a world where the pressures and priorities are manifold.

The AMC has developed accreditation standards for medical schools, prevocational training, and for specialist medical colleges (which includes standards for vocational training programs and Continuing Professional Development – CPD).

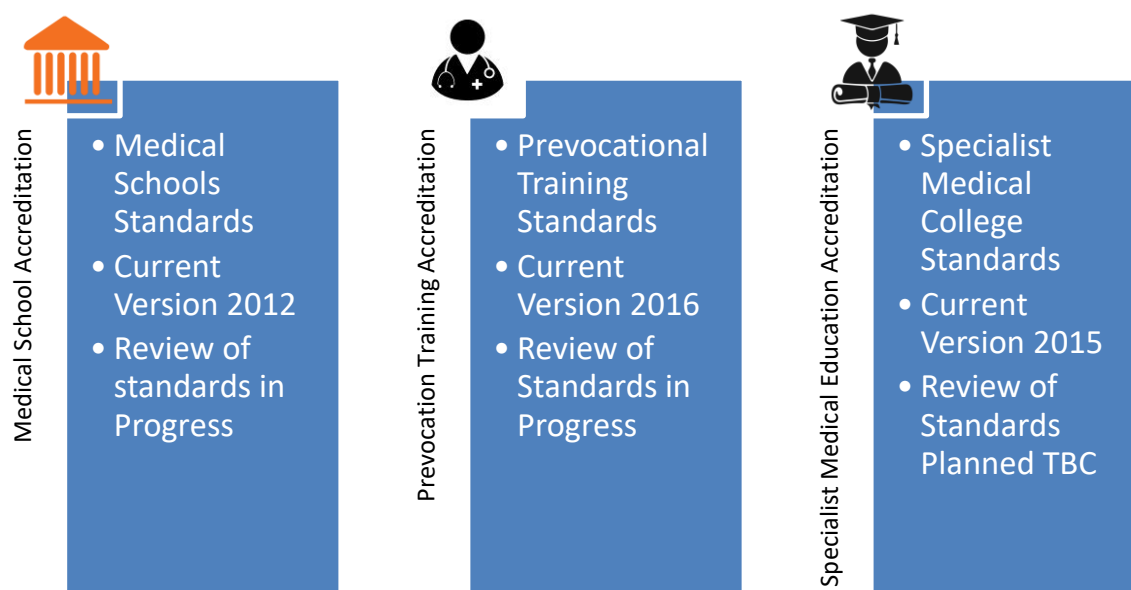


Figure 18: AMC Accreditation Standards Status.



1. The context of training and education
2. The outcomes of training and education
3. The curriculum/education and training framework
4. Teaching and learning
5. Assessment of learning
6. Monitoring and evaluation
7. Trainees/students
8. Delivery: supervisors, education & training sites, facilities
9. *Continuing professional development, further training, remediation*
10. *Assessment of specialist international medical graduates*

*\*Standards 9 and 10 apply to Specialist Medical Colleges only.*

*Figures 19: AMC Accreditation Standards (current).*

## AMC Graduate Outcome Statements

As part of its accreditation standards, the AMC sets out Graduate Outcome Statements. The Graduate Statements are a thematic framework that has been used to organise the AMC's Graduate Outcome Statements into four domains. These domains collectively provide the requirements that students must demonstrate at graduation. The outcomes contained in each domain are necessarily interlinked when students enter clinical practice.

The domain framework is a reference for medical education providers. A number of providers have similar frameworks and it is not envisaged that all providers will necessarily organise their curriculum themes in this way. Providers will need to demonstrate how their program enables their graduates to meet the outcomes, which specify what the AMC expects the provider to achieve and the health service employer expects the graduate to deliver. Each provider in their own context may wish to enable their graduates to demonstrate additional outcomes to the ones specified. [Extract *AMC Medical School Accreditation Standards* p 1, 2012]. The four domains are:



Figure 20: AMC Graduate Outcome Statements.

## AMC Accreditation Process

To ensure these standards are met, the AMC engages in accreditation processes, which focus on rigorous self-examination and peer review with the aim of supporting medical education providers to improve their educational programs with downstream impacts on doctor identity and competence.



Figure 21: AMC Programs Accreditation Cycle [Extract AMC Annual Report 2019-2020]

Analysis of Australian accreditation standards across the continuum (medical schools, prevocational, specialist vocational training and CPD) shows that there is little focus on digital capabilities in the graduate outcomes statement or medical education provider accreditation standards.

The AMC standards are an acknowledged lever for change, as Edirippulige et al (2018) in their study of all medical school curricula and interviews with curriculum and program leaders point out in – *Its Important, but not important enough: eHealth as a curriculum priority in medical school education in Australia*. In this article, they conclude that ‘medical schools consider eHealth to be important but systemic problems impede its inclusion in the curriculum. Until accrediting bodies expect competence in eHealth the situation is unlikely to change, and the future workforce will remain unprepared.’

The AMC is currently undertaking a review of the AMC Medical School Accreditation Standards and has the opportunity to consider the inclusion of digital capabilities into the

Medical School standards as well as the incorporation of broad areas of health reform as part of this standards review. Equally, these areas of health reform can be used to inform future accreditation standards reviews in Prevocational Training and for Specialist Colleges.

### **The proposed Medical School Graduate Outcomes for Medical Schools and Medical School Standards**

The proposed refinement to the consultation document for key **graduate outcomes** in Digital Health are set out below:

#### *Digital Capabilities: implications for medical services and practice*

Patients and doctors have increasing access to digital health tools. Current, emerging and future technologies are changing the way in which the medical and broader health workforce and health services are provided. These new technologies bring with them new knowledge and skill requirements, privacy concerns and protocols, ethics and new workflows and ways of working. A number of reviews in Australia and internationally call for doctors to support patients in navigating digital tools and to work in partnership with patients as they gain greater access to digital information and autonomy in monitoring and managing their health. Equally, these reviews have identified the need for doctors to increase their digital literacy and capability along with their understanding of health systems and human behaviour in order to optimise the application of current, emerging and personalised technologies in health care. The AMC's initial thinking is that medical graduates would be required to:

- integrate an understanding of risks and benefits, including ethical considerations, into the use of current, emerging and personalized digital health technologies in medical practice in a range of healthcare settings.
- demonstrate high levels of digital literacy and capability to be able to support patients and their carers to use technology to promote wellbeing, manage health concerns, minimise risk, and improve health outcomes and experiences
- Reflects on practice performance and improvement of shift in practice towards value based care and effective use of technologies through using key impact metrics:
  - effectiveness (curing patients at a better rate – reducing complications, reducing readmission, reducing emergency admission, learning a new skill, making a shift in personal practice)
  - efficiency of services (using resources in best way, balancing costs and benefits)
  - timeliness (reducing waiting times, GPs or before surgery)
  - patient quality and safety (quality, risk and bias in care)
  - patient-centredness (as measured by patient satisfaction and outcomes)
  - equity (access to quality services).

The proposed refinement to the consultation document for the Medical School Accreditation **Standards** in Digital Health are set out below:

<p><i>Digital Capabilities: curriculum and assessment design and delivery</i></p>	<p>Update standards related to resources and curriculum delivery to take account of technological infrastructure and emerging technologies supporting health care delivery. Technological change is having a substantial impact on healthcare delivery and models of care as well as creating opportunities for pedagogical innovation. The AMC does not prescribe how medical programs are delivered, it supports diversity and innovation. In updating the standards, the AMC is therefore proposing that medical schools have clear strategies included in their curriculum to build digital capabilities for safe and effective health service delivery. This includes consideration of digital capability development in the purpose statement and value proposition for the medical program, teaching and learning, assessment and evaluation, and that the program includes opportunities for students to learn through effective integration and modelling of current, emerging and personalised technologies in the delivery of the medical education program.</p> <p>Update the standards related to inter-professional learning to include reference to data scientists and engineers, supporting students to gain hands on experience of digital development and application in a health service context.</p>
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A key challenge in accreditation is the breadth of changes, which are occurring across a wide range of issues which this AMC horizon series of papers foreshadows. See the next section of this horizon paper for a summary of 12 areas of health reform which align closely with the National Medical Workforce Strategy 2021-2031, currently in consultation. It would be useful to map these priorities with the proposed Medical School Accreditation Standards Review.

## Recommendations

### 7. Accreditation: That the AMC and its partners:

- a) **Digital Health** Continue to work with partners and broader stakeholders across the continuum, interprofessionally and with inter-agency intent to further improve approaches to accreditation of digital health in medicine
- b) **Other Health Reforms** Engage further stakeholders (cross continuum, interprofessional and inter-agency) to further improve approaches to accreditation in broader areas of health reform
- c) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross continuum, interprofessional and inter-agency) to support the work of the AMC and its partners to further improve accreditation in digital health in medicine and in other areas of health reform.

## 8. Embedding Change in Complex Systems

*In this section, we focus on a current and future state analysis of embedding change in complex systems. We focus on the example of the cultural, people, structural and political considerations in embedding digital health in medicine across the medical education continuum. We conclude the section with some recommendations for future action.*



**Embedding Change** Design and Implementation across health systems and the continuum of medical education is complex. To effectively embed change which will stick, it is important to think through how to introduce the change into the system and how to approach it from a multi-dimensional perspective including consideration of political, cultural, structural and people frames.

### **Change in the context of developing capability in digital health in medicine and other areas of health reform**

As part of the AMC and Agency partnership project in Digital Health in Medicine change management principles have been adopted both in terms of the design and implementation of the project and its deliverables.

### **Future State**

Current literature regarding innovation in medical education focuses on the quality of educational product and is theoretically grounded in psychometrics.

Increasingly, it is becoming evident that whilst the quality of the innovation in medical education is vital, quality alone does not ensure success. This is because the context and times in which we find ourselves are ones of complex change and disruption.

To maximise the success of innovation and sustainability of educational programs, we need to explore program design and implementation in terms of complexity and adaptive systems.



### **Implementation challenges**

Some key challenges in medical education curricula change include:

- The crowded curriculum
- Importance of not reinventing the wheel – leveraging off good practice
- Professional development of supervisors to equip them to undertake new learning models
- Curriculum change management
- Agile project innovation
- Resistance to change
- Ensuring models are fit for purpose – stakeholders have opportunities to have their say
- Communication of change
- Technology infrastructure and access is in place
- Implementing competency-based approaches so they move being tick box to integrated programs of learning

- Implementation so that learning intervention works across diverse settings
- Monitoring and support of uptake and success to inform continuous improvement.

### A new lens? Complexity and Adaptiveness

It is useful to consider change from a complexity and adaptivity lens when undertaking educational innovation which:

- is large scale
- involves high stakes decisions
- is national or global
- involves changing/contesting the perception and role of education provider
- interfaces with employer processes
- disrupts existing practices
- prompts significant personal reaction from stakeholders.



### What change is needed?

See appendix 2 for key areas of health reform.

### Stepping Out the Change

*Three Horizon Thinking is a useful framework to consider the TIMING and SPACING of change activities.*

Three Horizon Thinking is based on research into how organisations sustain growth. This framework stresses that throughout their lifecycle organisations must attend to existing businesses (horizon 1) whilst still considering areas they can grow in the future (horizon 2 and 3).

Horizon 1 represents those core activities of the business most readily identified with the company name. Here the focus is on improving performance to maximise remaining value.

Horizon 2 encompasses emerging opportunities including to consolidate new businesses and may include significant investment in technology and spatial infrastructure, capability growth and processes.

Horizon 3 contains ideas for profitable growth down the road – for instance, small ventures such as research projects, pilot programs or minority states in new businesses which focus on new ways of growing the business and exploring new markets and ideas of what and how to do the business.

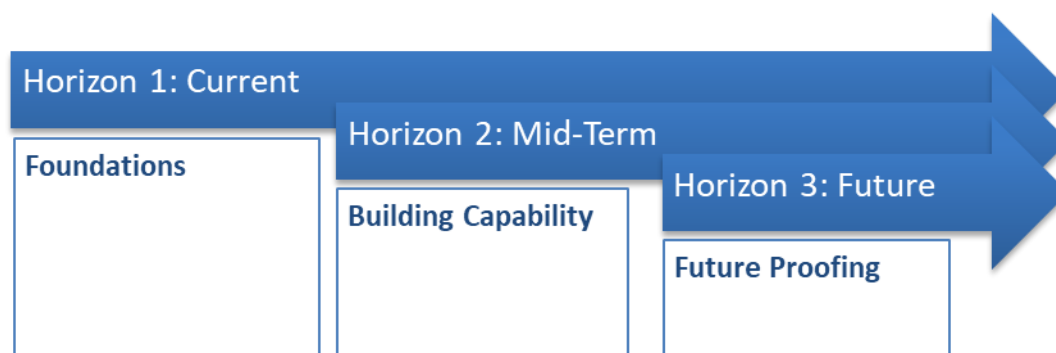


Figure 22: Three Horizon Thinking



**The Four Frames<sup>1</sup>** is a useful tool to help us with the change **TAKING HOLD** and **EMBEDDING** in the **Imagination, Systems and Institution**. It is based on research into how organisations adopt a balanced approach to leadership and organisational change. This framework stresses that throughout their lifecycle organisations must attend to activity in four key frames: the people, the political (adapted to partnerships in the proposed model), the culture and the structural.

Reframing organisations, through use of these four frames identified by Bolman and Deal, recognises that when many organisations face challenges a common default solution is the structural frame, which results in structural change. By seeking activity in all four frames research shows that change is more likely to be acceptable to stakeholders and leads to enduring change to practice.



**Structure** Emphasises the task related elements of work. It concentrates on strategy, measurable goals, clarifying tasks, responsibilities and reporting lines, agreeing metrics and deadlines and creating systems and procedures.



**Political** Addresses the idea that individuals and interest groups often have competing (often hidden) agendas, especially in times when budgets are limited and organisations need to make difficult choices. In this frame we see coalitions – building partnerships and alliances to support key initiatives.



**People** Places emphasis on people's needs, human contact, personal growth through learning and education and job satisfaction.



**Culture** Focuses on people's need for a sense of purpose and meaning in their work. It includes creating a motivating vision, attending to rituals including celebrations and everyday behaviours, which demonstrate and reinforce the value of the key initiatives.

Combining the two thinking tools for change together, The Three Horizons and Four Frames, yields a useful planning model that considers timing, spacing and embedding of change, as depicted in Figure 23.



Figure 23: Three Horizon Thinking and Four Change Frames

<sup>1</sup> Bolman and Deal

As an example of implementation strategies in digital health in medicine, some piloting and implementation considerations for implementation of the **capability framework for digital health in medicine** are as follows:

Stages of Program	Description
<b>Pilot Design and Implementation of Capability Framework</b>	A pilot of the design and implementation of the proposed medical education framework in digital health is conducted across jurisdictions and with the support of medical education providers across the continuum of medical education.
<b>Dependencies</b>	
Community Practice of	Collaborative, ongoing and sustained support needs to be provided so that education providers, health services and other stakeholders of medicine can share good practice examples in digital health in medical education. More advanced and well-resourced providers can share lessons learnt and good practice models are achieved through collaboration which ensures that smaller providers are not left behind. COPs ensure that the implementation is fit for purpose, supportive and collaborative.
Accreditation Standards	Design and approve AMC accreditation in digital health to clarify expectations, share good practice examples and support curriculum change across the continuum.
Communication	Clear information needs to be provided about the pilot and proposed implementation of the capability framework to medical education providers and jurisdictions. This needs to align with the broader Commonwealth Government plans for capability development of the health workforce across the health system.
Technology	<p>A dependency of the pilot is the availability of validated technology tools aligned with the three horizons. This is important so that medical practitioners across the continuum can undertake the task and have clear guidelines about optimal technology to access. Technology requirements for the horizons is as follows:</p> <ul style="list-style-type: none"> <li>• Telehealth (Horizon 1)</li> <li>• Electronic Record System (Horizon 1)</li> <li>• Genomics (Horizon 2)</li> <li>• Advanced Robotics (Horizon 2)</li> <li>• Artificial Intelligence (Horizon 2)</li> <li>• 3D Printing (Horizon 2)</li> <li>• Consumer health app or home technology devices (Horizon 3).</li> </ul> <p>A current risk is that smaller rural sites may have less access to emerging technologies than larger and better resourced flagship hospital settings in metropolitan areas. Equally, for horizon 3 technology some consumer groups i.e., aged care may have limited expertise and digital literacy in using consumer centred technology.</p> <p>A critical success factor of implementation will be fair and equitable access to emerging technologies by all medical practitioners. This will be important so that all doctors have access to the required technologies to achieve entrustment and experience with the</p>

	required technologies for each of the three horizons and related EPAs. In this way, equity of access will be assured, bottlenecks in training will not result and technology is more likely to deliver on one of its core promises and advantages: to improve access and equity in healthcare delivery and education in all healthcare settings.
Education Resources	<p>The EPA templates, teaching and learning programs, and assessment programs suggest a number of education resources which will help support the learning of medical doctors across the continuum. Base curated resources need to be available for the pilot so that medical professionals can learn knowledge, skills and attitudes relevant to each of the tasks and associated horizon in the Australian National Framework. The model will also require increased infrastructure i.e., learning management platform, and ePortfolio.</p> <p>Equally, it would be useful to consider how micro-credentials in Digital Capability Development could be offered as part of a broader Certificate of Health Reform with other micro-credentials on priorities such as Aboriginal and Torres Strait Islander Healthcare, Aged Care, Disability, Improving Access and Equity in Healthcare, Training Pathways etc.</p>
People Training (Awareness and Skills Development Training)	<p><b>System Leaders and Medical Education Leaders:</b> Health system leaders across the jurisdiction and in Commonwealth Departments and Medical Education leaders in jurisdictions and medical education providers need to have opportunities to gain awareness of the Digital Health Capability Framework in Medicine and implications for their medical workforce and others across the health system.</p> <p><b>Medical Education Supervisors:</b> Vital to the success of the implementation of the pilot and subsequent rollout of the capability framework in medicine is the need to provide quality supervisor training to ensure that supervisors have an awareness of the framework and build skills so that they can implement the framework effectively and integrate it into their teaching and supervisory practice.</p> <p><b>Digital Experts in Jurisdictions and Technical Support People:</b> Digital champions and the technical support team across the jurisdictions need to be aware of this framework and the associated technology requirements. They need to be ready to act as champions for the implementation of this framework in their setting and provide the technical support for its implementation.</p>
Impact Evaluation	Analyse the success and challenges of the proposed framework so recommendations for further improvement can be made. Technology solutions for data collection and analysis of impact need to be confirmed. Impact evaluation needs to focus on the success of the learning intervention and consider a myriad of interacting factors within complex systems such as health and medical education.
Research	Ethics approval and a formal research project should be prepared to contribute to the body of evidence in the formal literature of digital health in medical education.

<b>Implementation Plans</b>	Following adjustments to the framework implementation plans are developed aligned with pilot recommendations which test implementation in a range of settings and contexts. Implementation plans need to include clear roles and responsibilities for different stakeholders, models of sustained resourcing, key milestones and dependencies.
<b>Stages of Program</b>	<b>Description</b>
<b>Pilot Design and Implementation of Capability Framework</b>	A pilot of the design and implementation of the proposed medical education framework in digital health is conducted across jurisdictions and with the support of medical education providers across the continuum of medical education.
<b>Dependencies</b>	
Accreditation Standards	Design and approve AMC accreditation in digital health to clarify expectations, share good practice examples and support curriculum change across the continuum.
Communication	Clear information needs to be provided about the pilot and proposed implementation of the capability framework to medical education providers and jurisdictions. This needs to align with the broader Commonwealth Government plans for capability development in digital health across the health system.
Technology	<p>A dependency of the pilot is the availability of validated technology tools aligned with the three horizons. This is important so that medical practitioners across the continuum can undertake the task and have clear guidelines about optimal technology to access. Technology requirements for the horizons as set out in the <a href="#">National Digital Health Workforce and Education Roadmap</a> is as follows:</p> <ul style="list-style-type: none"> <li>• Telehealth (Horizon 1)</li> <li>• Electronic Record System (Horizon 1)</li> <li>• Genomics (Horizon 2)</li> <li>• Advanced Robotics (Horizon 2)</li> <li>• Artificial Intelligence (Horizon 2)</li> <li>• 3D Printing (Horizon 2)</li> <li>• Consumer health app or home technology devices (Horizon 3)</li> </ul> <p>A current risk is that smaller rural sites may have less access to emerging technologies than larger and better resourced flagship hospital settings in metropolitan areas. Equally, for Horizon 3 technology some consumer groups i.e., aged care may have limited expertise and digital literacy in using consumer centred technology.</p> <p>We need to ensure, through fair and equitable access to emerging technologies, that all medical practitioners have access to the required technologies to implement the capability framework or be able to integrate the proposed model into their existing program.</p>
Education Resources	The framework suggests a number of education resources which will help support the learning of medical doctors across the continuum. Base curated resources need to be available for the

	<p>pilot so that medical professionals can learn knowledge, skills and attitudes relevant to each of the tasks and associated horizon in the Australian National Framework. The model will also require increased infrastructure i.e., learning management platform, and ePortfolio.</p> <p>Equally, it would be useful to consider how micro-credentials in Digital Capability Development could be offered as part of a broader Certificate of Health Reform with other micro-credentials on priorities such as Aboriginal and Torres Strait Islander Healthcare, Aged Care, Disability, Improving Access and Equity in Healthcare, Training Pathways etc.</p>
People Training (Awareness and Skills Development Training)	<p><b>System Leaders and Medical Education Leaders:</b> Health system leaders across the jurisdiction and in Commonwealth Departments and Medical Education leaders in jurisdictions and medical education providers need to have opportunities to gain awareness of the Digital Health Framework in Medicine and implications for their medical workforce and others across the health system.</p> <p><b>Medical Education Supervisors:</b> Vital to the success of the implementation of the pilot and subsequent rollout of the capability framework in medicine is the need to provide quality supervisor training to ensure that supervisors have an awareness of the framework and build skills so that they can implement the framework effectively and integrate it into their teaching and supervisory practice.</p> <p><b>Digital Experts in Jurisdictions and Technical Support People:</b> Digital champions and the technical support team across the jurisdictions need to be aware of this project and the associated technology requirements. They need to be ready to act as champions for the implementation of this framework in their setting and provide the technical support for its implementation.</p>
Impact Evaluation	Analyse the success and challenges of the proposed framework so recommendations for further improvement can be made. Technology solutions for data collection and analysis of impact need to be confirmed.
Research	Further research may need to be undertaken related to the implementation of the digital health in medicine framework. Ethics approval and a formal research project should be prepared to contribute to the body of evidence in the formal literature of digital health in medical education.
<b>Implementation Plans</b>	Following adjustments to the framework implementation plans are developed aligned with pilot recommendations.

The key message in considering change is that **context matters**.

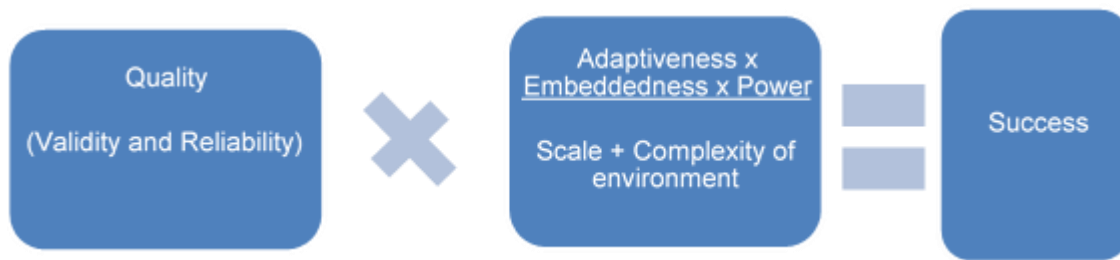


Figure 24: A model of success

## Recommendations

### 8. Embedding Change in Complex Systems: That the AMC and its partners:




- a) **Digital Health** Continue to work with partners and broader stakeholders across the continuum, interprofessionally and with inter-agency intent to embed curriculum change in designing and implementing in the digital health in medicine across the medical education continuum
- b) **Other Health Reforms** Engage further stakeholders (cross continuum, interprofessional and inter-agency) in supporting curriculum change in medicine aligned with other health reform priorities
- c) **Further Partnerships** Establish further partnerships with government agencies and other stakeholders of medical education (cross continuum, interprofessional and inter-agency) to support the work of the AMC and its partners to further improve change management in digital health in medicine and in other areas of health reform.








# Summary of Recommendations

Alignment of 8 Levers of Workforce Change with three key priorities	Digital Health Continue to work with partners and broader stakeholders across the continuum, interprofessionally and with inter-agency intent in designing and implementing in the digital health in medicine across the medical education continuum.	Other health reforms Engage further stakeholders (cross continuum, interprofessional and inter-agency) in medicine aligned with other health reform priorities.	Further partnerships Establish further partnerships with government agencies and other stakeholders of medical education (cross continuum, interprofessional and inter-agency) to support the work of the AMC and its partners in digital health in medicine and in other areas of health reform.
1. Thought Leadership	✓	✓	✓
2. Cross Continuum, Interprofessional and Inter-Agency Collaboration	✓	✓	✓
3. Capability Framework for Medicine	✓	✓	✓
4. Good Practice Curated Collections and Support	✓	✓	✓
5. Certification	✓	✓	✓
7. Assessment and Measurement of Impact	✓	✓	✓
8. Embedding Change in Complex Systems	✓	✓	✓

# Appendix 1: Levers for Change – Eight Key Areas of Future Collaboration

	<p><b>Thought Leadership</b> is vital to help change medical education and practice through the development of evidence based research, strategy and community of practice activities and events. Importantly, thought leadership is framed as a collective activity with the fostering of communities of practice and champions of change across the health sector and medical education continuum, rather than thought being led exclusively by a few learned experts. This will involve the need to collaborate with stakeholders on research concerning AI and ethics in the health sector and broadly of the Impact of Future Technology Disruption on Workforce Change and Development in Health, Education and Medicine. In addition, we will explore patient rights perspective and legal implications of digital health. We will also collaborate with our partners regarding horizon series discussion papers aligned with health reform priorities, research papers, and book chapters. This partnership will jointly conduct workshops, community of practice support and conference events.</p>
	<p><b>Cross Continuum, Interprofessional and Inter-Agency Collaboration</b> Central to the value proposition and methods underpinning the AMC is cross continuum interprofessional and inter-Agency collaboration. This ensures that AMC products and approaches are fit for purpose and that communication with stakeholders as well as opportunities for input into design is achieved. This is also key in sharing expertise across programs and the health system and building relationships based on trust and respect.</p> <p><b>Cross Continuum, Interprofessional and Inter-Agency Collaboration in the context of developing capability in digital health in medicine and other areas of health reform</b></p> <p>This will involve the need to collaborate across the continuum, with other health professional groups and with other agencies which impact health outcomes and experiences. The partnership between the AMC and the Agency has reflected such broad collaborations across the sector and builds on the strong collaborative approach of the AMC which has built strong relationships with key stakeholders of health in undertaking its work over the last three decades.</p>
	<p><b>Capabilities Framework for Medicine</b> Capability frameworks are useful in that they help clarify the skills, knowledge, attitudes and tasks that doctors need to learn and competently perform as part of their professional practice. This will involve the need to identify and review professional and accreditation standards in digital health and education across the health workforce. This will involve drawing on national and international trends and frameworks (particularly medicine, nursing, pharmacy and allied health) and ensuring alignment with Safety and Quality Frameworks for the Australian health system. A vital feature will be to ensure that we do not “reinvent the wheel” and build on good current practice in developing implementable models of curricula change which medical education providers can integrate across the continuum into their curricula change programs. This work will also involve providing good practice examples of what core and foundational capabilities are, teaching and learning support, assessment and methods of measuring impact.</p> <p><b>Capability Frameworks in the context of developing capability in digital health in medicine and other areas of health reform</b></p>

	<p>This will involve the need to collaborate on the co-design of capability frameworks. An exemplar of such an approach is the development of the Digital Health in Medicine Capability Framework, which is currently in consultation phase.</p>
	<p><b>Good Practice Curated Collections and Support</b> Many good practice medical education resources exist online. The challenge is they can be developed by a range of different providers. They can also be of variable quality. Curated collections of good practice are useful in that they take the work out of individual professionals needing to search for good practice samples to help them learn what they need to know in a priority area. This involves the need to work with professionals and medical education providers to curate good practice examples of effective use of digital technologies in the delivery of medical education curricula and service provision. Curated collections are best selected based on rigorous quality criteria including content, accuracy, and education methods underpinned by peer review processes. Good practice guides can also consider how technologies can be used to support communities of practice and lifelong learning.</p> <p><b>Good Practice Curated Collections and Support in the context of developing capability in digital health in medicine and other areas of health reform</b></p> <p>As part of the Digital Health in the Medical Workforce Project, the AMC has worked with education providers to create and share case studies of good medical practice. It has explored the literature to provide evidence of good practice of teaching and learning resources for digital health in medical education. The capability framework outlined in the previous section is also a strong contribution to the evidence and support for medical education providers. It will be important to review these resources over time to ensure that they remain current.</p>
	<p><b>Assessment and Measurement of Impact</b> Assessment is important because it provides vital information about competence of doctors. Measurement of Impact occurs at the broader program level with a focus on measuring the outcomes and impacts of change initiatives. Through its accreditation role the AMC plays a vital role to ensure the assessment methods of medical education providers are in line with current evidence-based good practice across the medical education continuum. Equally important is the need to develop better standards and methods of measurement of impact at an individual and system level of curricula change and planned outcomes. The measurement of impact is challenging and in need for further support. A further area of development for the AMC is to contribute to the collective evidence about how to use current and emerging technologies to deliver and measure good practice assessments as well as to ensure that digital capabilities are integrated into the assessment of doctors' performance. Furthermore, in its role in the design and delivery of assessment methods of International Medical Graduates (IMGs) and Assessment Pathways, the AMC demonstrates effective use of current and emerging technologies. A further area of development in IMG assessments is to ensure that the assessment of candidates' digital capabilities is integrated into assessment of their performance.</p> <p><b>Assessment and Measurement of Impact in the context of developing capability in digital health in medicine and other areas of health reform</b></p> <p>As part of the Digital Health in the Medical Workforce Project, the AMC has highlighted the need for digital capabilities to be integrated into the assessment programs of medical education providers. It is also emphasised as part of the Digital Capability Framework that digital technologies can be used to further support good assessment processes. Examples are provided in this section of how the AMC is innovating in assessment processes through effective use of digital technologies.</p>

	<p>It is vital that medical professionals gain certification for their learning. Certification can relate to new specialties create opportunities for creative careers in medicine as well as digital micro-credentialling and smaller bite size learning opportunities, which can help doctors to learn flexibility, maximises their mobility and ability to act responsively to disruptive change and new health reforms. This also involves the need to create the evidence and pathways for new specialties in medicine for approval from the Medical Board and Commonwealth, to provide advice and consultation feedback on creative careers in medicine required for future workforce planning for medically trained doctors, and to support medical education providers in creating streamlined training pathways aligned with workforce health needs and support models of lifelong learning, which provide learning in manageable certified “chunks” including short courses, micro-credentials and digital evidence of learning gained.</p> <p><b>Certification in the context of developing capability in digital health in medicine and other areas of health reform</b></p> <p>This will involve the need to collaborate on creating more streamlined and agile ways of providing and supporting certification in areas related to digital health capability development for all doctors and for specific technology based careers.</p>
	<p><b>AMC Accreditation</b> AMC accreditation is a major way to effect curricula change across the continuum in medical education. This involves the need to maximise levers of change in creation of a digitally capable future workforce and fostering of quality improvements to medical practice and provider support through accreditation processes. Design and implement an approach to review AMC accreditation standards, graduate outcome statements and AMC support to address incorporation of future change impacting the medical professions (including digital capabilities) for the continuum of medicine (medical schools, intern training and Colleges – vocational specialist training and lifelong learning).</p> <p><b>Accreditation in the context of developing capability in digital health in medicine and other areas of health reform</b></p> <p>As part of the AMC and Agency partnership project in Digital Health in Medicine recommendations have been made as part of the consultation process for the AMC Medical Standards Accreditation Review (currently in consultation).</p>
	<p><b>Embedding Change</b> Design and Implementation across health systems and the continuum of medical education is complex. To effectively embed change which will stick, it is important to think through how to introduce the change into the system and how to approach it from a multi-dimensional perspective including consideration of political, cultural, structural and people frames.</p> <p><b>Change in the context of developing capability in digital health in medicine and other areas of health reform</b></p> <p>As part of the AMC and Agency partnership project in Digital Health in Medicine change management principles have been adopted both in terms of the design and implementation of the project and its deliverables.</p>

# Appendix 2: Health Reform - Twelve Key Priorities

## Worked example for digital health:

Alignment of digital health with the 8 levers of workforce change explored in this horizon paper.

- 
1. **The development of a Digitally Capable Australian and New Zealand Medical Workforce** through cross continuum learning, assessment and evaluation;

Other areas of health reform which may be leveraged through eight levers of workforce change:

2. **Sustainable medical work practices and cultures** – doctor wellbeing, improved role clarity and leadership, zero tolerance of bullying, harassment and discrimination, safe working hours and promotion of flexible working models and work life balance;
3. **Inter-professionalism and Inter-agency action for improved health outcomes and experiences** through reducing silos, tribalism and cultural barriers to collaboration and joint action for health change;
4. **People-Centred Value-based Care: Quality Improvement in Integration and Take Up of National and Global Health Value-Based Solutions to Service Delivery and Health Education** to reduce Geographic mal-distribution, and inequalities in healthcare access – tackling longstanding challenges in health with a focus on supporting vulnerable health groups and minimising effects of stigmatizing health conditions and marginalized groups (rural and remote, chronic illness and co-morbidities, disability, aged care, domestic violence, sexual abuse, sexual orientation and gender identity, addiction, homelessness and unemployment, refugees, human trafficking, and mental health);
5. **Indigenous Health and Cultural Safety** - closing the gap targets, growing the number of Aboriginal and Torres Strait Islander doctors and ensuring a culturally safe workforce;
6. **Service delivery, changing health needs and models of care** with a focus on continuity of care, prevention and quality and safety improvements;
7. **Innovations in Medical Education and Lifelong Learning** for Improved Health Outcomes and Impacts;
8. **Emergency Response and Regeneration** to collect lessons learnt from COVID-19 and other emergency outbreaks to improve practices and plan for future emergencies;
9. **Environmental Impacts and Sustainability in Health** to minimise the environmental footprint of health services and delivery as well as increase the awareness of doctors to the importance of environmental impacts and sustainable work practices;
10. **Doctor readiness in a changing world** – lifelong learning for lifelong health;
11. **Medical Workforce Immigration and Domestic Workforce Supply, Mix and Distribution** – over and under supply of specialties, balance of generalist and sub specialists, change and future workforce needs, workforce diversity, roles and location;
12. **Business and Financial Modelling in Medical Education and Accreditation** for a Sustainable Future of workforce development in Medicine in Australia.



# Appendix 3: Definitions of Certification Categories

Key concepts related to this continuum are set out in the table below:

<b>Specialist Pathways</b>	<p>In Australia, Specialist Medical Doctors engage in extensive training, which is undertaken in a continuum of learning involving four key stages: medical school, prevocational training, vocational and an ongoing commitment to medical education through completion of Continuing Professional Development (CPD). This training generally takes 14-16 years to complete with lifelong learning following certification as a specialist. There are currently 54 AMC approved specialist medical programs. These programs are subject to regular review as part of AMC accreditation process of Specialist Colleges.</p> <p>New or amended specialties are approved by the COAG Health Council on the recommendation of the Medical Board of Australia. The recognition of a new or amended specialty by the COAG Health Council is a 'regulatory instrument'. It extends the scope of offences that apply to the unauthorised use of protected specialist titles and to individuals who otherwise hold themselves out as being authorised or qualified to use the titles. Therefore, the process for assessing whether a new or amended specialty should be recognised is rigorous. It includes public consultation and oversight of the regulatory assessment process by the Office of Best Practice Regulation Commonwealth Department of Prime Minister and Cabinet. The COAG Health Council may approve a new or amended specialty only after a public benefit has been demonstrated. That is, applicants proposing a new or amended specialty for recognition under the National Law must establish that there is a need for requiring government intervention (regulation) in the interests of the public and that existing arrangements or other alternative non-regulatory options are unsatisfactory. Specialist recognition is not about the interest or prestige of the practitioners who are seeking this recognition. [Extract Guidelines for the Recognition of Medical Specialties and Fields of Specialty Practice Under the Health Practitioner Regulation National Law]. Since 2008, only one new specialty has been approved through this pathway, with the approval by COAG in 2018 of the Paediatric Emergency Medicine Specialty of Emergency Medicine. This is in line with current Commonwealth Government strategic directions to focus on support of existing specialties, balanced with generalism and task delegation to a wider range of health professionals rather than creation of new specialist medical pathways.</p>
<b>Creative Careers in Medicine</b>	<p>The field of Creative Careers in Medicine shows how career planning, flexible shape-shifting portfolio concepts, coaching and mentoring can help open up different career opportunities to medically trained doctors.</p> <p>We're seeing doctors wanting a better lifestyle and flexibility - basically all the things everyone else in the modern workforce is demanding at the moment. The traditional 'see your patient in a</p>



	<p>clinic or a hospital' model is being disrupted with new technologies such as telehealth, artificial intelligence and digital health. New career opportunities are opening up for doctors at a rapid pace.</p> <p>CCIM is a forum where doctors who have an interest in pursuing a 'Portfolio Career' can meet, network and listen to inspirational stories of doctors who have already made the move and get some advice on the various pathways they can take. [Extract CCIM Website]</p> <p><a href="https://wave.com.au/blog/looking-for-medical-career-inspiration/">https://wave.com.au/blog/looking-for-medical-career-inspiration/</a></p>
<b>Microcredentialling</b>	<p>Microcredentials are certification-style qualifications that individuals choose to study to improve a skill found in a particular industry area. They are short, low-cost online courses that provide learners with a digital certification or a 'digital badge' when complete. Micro-credentials are being put to a number of uses that are forcing higher education institutions to think carefully about the value of their traditional assessment and credentialing practice and, indeed, how they are enacting this practice.</p>
<b>Informal Learning</b>	<p>Traditionally, lifelong learning recognition has been inconsistently used by regulators, professional bodies and employers in different parts of the world. Many health workers have skills and undertake learning in areas for which they receive no formal recognition. Therefore, it becomes difficult for learners, employers and regulators alike to provide evidence and interpret employees' skills and capabilities.</p>

# Appendix 4: Measuring Impact in Digital Health in Medical Education

Level of Impact Measurement	Performance Measures	Methods of Evaluation and Data Collection
<p><b>Pre-Implementation:</b> In this stage the AMC confirms foundational capabilities and teaching and learning as well as assessment programs to support a robust workforce education program in Medicine aligned with the National Digital Roadmap.</p> <p>This stage also includes the provider's self-assessment of current curricula and proposals of how they will implement and evaluate the development of digital capabilities in their component of the medical education continuum.</p>		
<p><b>Level 1:</b></p> <p><b>KP1 1:1</b></p> <p><b>Existence of Capabilities Roadmap, Guidelines or Framework</b></p>	<ol style="list-style-type: none"> <li>1. Publication of digital framework by AMC and its partners across the medical continuum</li> <li>2. Measure completion and readiness of curriculum product</li> </ol>	<ul style="list-style-type: none"> <li>• Map design, development, implementation and evaluation of the Foundational Digital Capability Framework in Medicine</li> <li>• Conduct debriefs with co-design groups, partners, workstream leads, key committees and working groups and broader stakeholders of Agency and AMC.</li> </ul>
<p><b>Level 1:</b></p> <p><b>KP1 1:2</b></p> <p><b>Training Program Design, Development and Innovation</b></p>	<ol style="list-style-type: none"> <li>3. Self-assessment by medical education providers concerning the integration of digital health capabilities as well as teaching and learning and assessment into current curricula and future curricula plans</li> <li>4. Measure completion and readiness of curriculum product</li> </ol>	<ul style="list-style-type: none"> <li>• Map design, development, implementation and evaluation of curriculum</li> <li>• Evaluate stages of maturity of product – current and future state provider curricula frameworks - design, development, implementation and evaluation processes</li> </ul>
<p><b>Level 1:</b></p> <p><b>KP1 1:3</b></p> <p><b>Training Program Uptake by Providers</b></p>	<ol style="list-style-type: none"> <li>5. Evaluate uptake of Medical education providers of digital health in medical programs: <ul style="list-style-type: none"> <li>• Foundational Capabilities</li> <li>• Teaching and Learning Programs</li> <li>• Assessment Programs</li> </ul> </li> <li>6. Measurement of medical education providers already compliant with the</li> </ol>	<ul style="list-style-type: none"> <li>• Collect data on those providers already compliant with the requirements of the Digital Health Foundational Capability Framework</li> <li>• Collect data on uptake of digital health in medical education programs</li> <li>• Conduct debriefs with providers concerning</li> </ul>

	requirements of the digital capabilities in medicine <ul style="list-style-type: none"> <li>• Foundational Capabilities</li> <li>• Teaching and Learning Programs</li> <li>• Assessment Programs</li> </ul>	uptake – challenges and opportunities.
<b>Level 1:</b>  <b>KPI 1.4</b>  <b>Training Program Implementation and Evaluation Plan</b>	7. Collect provider plans for implementation and evaluation of their digital health capabilities in their curricula, teaching and learning plans and assessment plans as well as plans to evaluate success	<ul style="list-style-type: none"> <li>• Gain plans from medical education providers</li> <li>• Surveys and focus groups</li> </ul>
<b>During Implementation:</b> This stage focuses the medical doctors' participation and completion of learning and assessment activities which foster digital capabilities in their medical education programs.		
<b>Level 2:</b>  <b>KPI 2.1</b>  <b>Program Participation</b>	8. Collect data on learner participation in the digital capability framework per provider	<ul style="list-style-type: none"> <li>• Participation rates – provided by providers</li> </ul>
<b>Level 2:</b>  <b>KPI 2.2</b>  <b>Program Completion</b>	9. Collect data on learner completion of the digital capability framework	<ul style="list-style-type: none"> <li>• Completion rates – provided by providers</li> </ul>
<b>Post Implementation:</b> In this stage, the AMC and its partners measure the impact of foundational capabilities and teaching and learning as well as assessment programs in supporting a robust workforce education program in Medicine aligned with the National Digital Roadmap.  This stage focuses on exploring impact from the perspective of learners across the continuum (their learning experiences and learning outcomes); the health system improvements and patient and community (their experiences and health outcomes).  Impact is measured with reference to the six dimensions of impact evaluation on clinical practice and health system improvement: <ul style="list-style-type: none"> <li>• effectiveness (curing patients at a better rate – reducing complications, reducing readmission, reducing emergency admission)</li> <li>• efficiency of services (using resources in best way, balancing costs and benefits)</li> <li>• timeliness (reducing waiting times, GPs or before surgery)</li> <li>• patient quality and safety (quality, risk and bias in care)</li> <li>• patient-centredness (as measured by patient satisfaction and outcomes)</li> <li>• equity (access to quality services).</li> </ul>		

<b>Level 3:</b> <b>Medical Doctor Learning Experiences and Attitudes</b>	10. Collect interest and satisfaction data and other attitudinal data	<ul style="list-style-type: none"> <li>• Surveys to gauge interest in digital health across the medical continuum and where curriculum is in use – data of effectiveness of the EPAs and learning programs/assessment programs</li> <li>• Focus groups and debrief sessions</li> <li>• UX walk throughs and analysis</li> </ul>
<b>Level 4:</b> <b>Medical Doctor Lifelong Learning Behaviour, Performance/Learning Outcomes</b>	11. Collect comparative data on pre course and post curriculum integration learning, behaviour and performance outcomes	<ul style="list-style-type: none"> <li>• Pre and Post survey mapped to course learning outcomes</li> <li>• Assessment data drawn from completion of EPAs - assessment tasks and activities</li> <li>• Pre and Post curriculum completion data mapped to the six dimensions of impact as set out above</li> <li>• Multisource feedback from workplace colleagues on achievement of learning outcomes and changes in performance levels</li> </ul>
<b>Level 5:</b> <b>Health Systems Process Improvement and Performance</b>	12. Collect comparative data on pre course and post curriculum integration outcomes on system	<ul style="list-style-type: none"> <li>• Pre and Post survey mapped to curriculum learning outcomes</li> <li>• Pre and Post curriculum uptake data mapped to the six dimensions of impact as set out above</li> <li>• Multisource feedback from workplace colleagues on achievement of learning outcomes and changes in performance levels</li> </ul>
<b>Level 6:</b> <b>Patient and Health Community Experiences and Outcomes</b>	13. Collect comparative data on pre curriculum and post curriculum integration outcomes mapped to patient and health community experiences and outcomes	<ul style="list-style-type: none"> <li>• Pre and Post survey course data mapped to patient and community experiences and outcomes – targets of EPAs and broader digital frameworks</li> <li>• Pre and Post curriculum uptake data mapped to patient data related to the</li> </ul>

		<p>six dimensions of impact as set out above</p> <ul style="list-style-type: none"> <li>• Analysis with comparator data sets at nation state, Regional, health facility and education provider level where available.</li> </ul>
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*Figure 25. Evaluation levels for health education (adapted from Belfield et al, 2001) and the GRASP Framework, Khalifa et al. 2019.*

# Appendix 5: Question Guide for Implementation and Embedding the Change

Implementation of a robust AMC Digital Capability Framework is more than a technical exercise. The following questions and support strategies based on the leadership and organisation reframing change model of Bolman and Deal<sup>2</sup> is designed to explore some of these broader issues of design and implementation of the change including about the structural, people, power/political, and cultural issues impacting on Digital Capabilities in Medical Education Programs.

## Structure



The structural frame of an organisational change focuses on elements such as review of the organisational structure and impact of the change on workflow. In this frame strategy is established and resource management and technology infrastructure is considered. It also takes into account key tasks which need to be undertaken related to the change and role definition - who is doing what.

### Key focus questions

1. **Strategy:** What is the change management and implementation strategy for the AMC role in the enablement of a digitally capable health workforce in Australia and New Zealand?
2. **Governance and policy:** How does implementation of the AMC strategy of enablement of a digitally capable health workforce impact governance and policy at the AMC and its partner organisations? What are the legal frameworks and legislation related to the enablement of a digitally capable health workforce? What are the contractual elements impacting the enablement of a digitally capable health workforce in Australia and New Zealand?
3. **Technology Infrastructure:** How will the Digital Capability Framework impact the technology infrastructure at the AMC and in its partner organisations?
4. **Project planning:** How will the AMC establish a project plan setting out clear tasks and role delegation to implement the change?
5. **Organisational structure and workflow:** What is the impact of the Digital Capability Framework on the AMC and its partner organisation's structure and workflow?
6. **Roles and responsibilities:** How does the Digital Capability Framework change the roles of people at the AMC and its partner organisations?
7. **Resource management:** How will the Digital Capability Framework implementation be reflected in resource management planning at the AMC and its partner organisations?

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<sup>2</sup> Bolman and Deal 1991

## People



The people frame explores impacts on people. This frame focuses on the support required to enable people to actively engage in the change, the need to assess whether your organisation has the necessary capability to manage the change and stresses the importance of establishing plans post implementation for staff. Support strategies in this frame focus on communication, training, engagement and capability plans. It stresses the importance of rewards and recognition throughout the change process. The people frame acknowledges that people will have different reactions to the change ranging from early adopters to resisters. This frame focuses on listening to their voices and leveraging off their strengths to refine your development, risk management and implementation plans.

### Key focus questions

1. **Engagement:** What is the strategy and method to engage AMC staff and its partner organisations in the AMC Digital Capability Framework?
2. **Capability Assessment:** How capable are the AMC staff and AMC partner organisations to design and implement this change? Are additional resources and/or support plans required?
3. **Communication:** What is the communication plan related to the AMC Digital Capability Framework? What are the key messages, how can communication about the AMC Digital Capability Framework be delivered using trusted sources to those impacted by the change?
4. **Training:** What education and training should be accessed and promoted to support the AMC, partner organisations and community to gain the skills they need to adopt new ways of work?
5. **Reward and recognition:** How can AMC staff and the community be rewarded and recognised in their efforts as they engage in the change?
6. **Champions:** Who are the champions of the AMC Digital Capability Framework and how can the AMC draw on their energy, support and skills to help with the change?
7. **Managing resistance:** What is the nature and reason for and sources of the resistance and fear of change - what aspects should be considered in improvements to approaches in minimisation of risk and which concerns are unfounded? What is the AMC strategy for turning unfounded negativity around?
8. **Post implementation plans:** What are the ongoing requirements of the AMC Digital Capability Framework post implementation? What plans do you need to put in place at the AMC and in partner organisations to ensure ongoing support for staff in maintaining the system?

## Power/ politics



The power/political frame recognises that the implementation of the AMC Digital Capability Framework may involve shifts in the power dynamics between different groups impacted by the change. A useful strategy for mapping the political landscape is to create a 'heat map' of the AMC and its partner organisations to draw a visual representation of the supporters and resisters of your planned change. This frame can unmask some of the underlying barriers and threats which if left unattended can result in lack of engagement with and adoption of the change. In addition, this frame includes new opportunities and ways of working. The power/political frame includes positive and enabling strategies such as the forging of new partnerships and networks and the mobilisation of non-human agency through the use of technologies. Encouraging individuals and organisations to form partnerships and new networks dedicated to new ways of working can render broad benefits at an individual, organisational, community and system level. Central to this frame is resilience and the openness of spirit to explore new opportunities to innovate, create efficiencies and minimise risk.



### Key focus question

1. **Power dynamics:** what are the power dynamics within the AMC and its partner organisations in fostering digital capabilities across the Australian and New Zealand health workforce? What are their attitudes towards change and specifically change related to adoption of the AMC Digital Capability Framework?
2. **Heat maps:** Consider drawing a visual heat map showing adoption of the Digital Capability Framework at the AMC, its partner organisations and the broader healthcare community - red for resistance, orange for luke-warm, green for champions.
3. **Resistance plans:** What is the AMC plan to manage those resistant to change?
4. **Partnerships and networks:** What partnerships and networks can you engage in to support the AMC, its partner organisations and health community implement the AMC Digital Capability Framework?
5. **Non-human agency:** How can the AMC Digital Capability Framework be used to improve efficiencies, minimise risk and innovate in your organisation and health community?
6. **Resilience:** How is the AMC and its partner organisations planning to build resilience through the change process in implementing the AMC Digital Capability Framework?
7. **Openness to new opportunities:** How is the AMC and its partner organisations planning to foster and lend power to the opportunities the AMC Digital Capability Framework achieves for individuals, organisations, systems and health communities?

### Culture



The cultural frame is typically thought of as "the way we do things around here". Culture is expressed in the everyday acts and behaviours accepted and reinforced by the organisation and individuals within it. The organisational culture is reinforced through an official account and the rituals and stories it tells internally and externally. To instigate cultural change one can draw on the evidence of ethnography (observation of how things are actually done in the organisation), symbols and most powerfully through the behaviour promoted and modelled by its leaders. Importantly, culture is enduring and complex to change. It requires time, patience, a commitment to learning, quality improvement and collective efforts drawn from implementation of strategies in the other frames to evolve and instigate positive change - from little pockets of change big things can grow.

### Key focus question

1. **The way we do things:** If you had to describe "the way we do things around here in terms of attitudes and adoption of digital practices" at the AMC and in its partner organisations - what would your answer be?
2. **Official accounts:** What is your official account of the promotion of fair and transparent methods of fostering digital capabilities at the AMC and its partner organisations?
3. **Everyday acts and behaviours:** How consistently is the official account reinforced by the everyday acts and behaviours of AMC employees, partners and the community?
4. **Rituals:** What rituals does the AMC and its partner organisation have related to digital capabilities? What new rituals could you introduce to reinforce the use and value of the Digital Capability Framework at the AMC and in its partner organisations?
5. **Symbols:** What symbols represent the AMC and its partner organisations and how do they relate to the fostering of digital capabilities? What new symbols could be introduced to reinforce the use and value of the AMC Digital Capability Framework at the AMC and in its partner organisations?
6. **Stories:** What stories are told at an official and informal level related to the fostering of digital capability at the AMC and in its partner organisations?

7. **Leadership:** How supportive are the key leaders at the AMC, its partner organisations and in the health community for the fostering of digital capability across the health workforce? How is the AMC and its partner organisations going to encourage champions for change?
8. **Modelling:** To what extent do you model use of clinical assessment and support of the AMC Digital Capability Framework in your everyday behaviour?
9. **Ethnography:** Consider doing a rapid ethnography at the AMC, its partner organisations and broader community where you track current workflow and practices and see the benefits of the same encounter using digital capabilities in the health workforce in Australia and New Zealand. What did you find out? What were the pain points and opportunities? What are some work arounds to further improve and maximise positive uptake and integration of the AMC Digital Capability Framework?
10. **Time:** Consider the profile and personalities of the staff in the AMC, its partner organisations and the broader health community. What are their time preferences - quick adoption or slower processing including reflection. What is a reasonable timeframe to bring about change? How can you break this change down in manageable bite size chunks and progressively implement viable solutions and innovate further to improve systems and approaches?
11. **Organisational learning:** How do you gather and act on insights and feedback loops to further improve systems to foster digital capabilities across the Australian and New Zealand health workforce?

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