

# PREPARING AUSTRALIAN HEALTHCARE MANAGERS FOR ARTIFICIAL INTELLIGENCE: CURRENT TRENDS AND STRATEGIC IMPERATIVES

*Sandeep Reddy*

School of Public Health and Social Work, Queensland University of Technology, Australia

Correspondence: [sandeep.reddy@qut.edu.au](mailto:sandeep.reddy@qut.edu.au)

## ABSTRACT

### OBJECTIVE:

To analyse current trends in healthcare Artificial Intelligence (AI) implementation in Australia, identify key management challenges, and provide evidence-based recommendations for preparing healthcare managers for AI integration.

### METHODS:

A comprehensive literature review was conducted using multiple databases, including PubMed and Google Scholar, with search terms such as "Australian healthcare," "artificial intelligence," "management," "implementation," and "strategy." The review focused on publications from 2020 to 2025. Data sources included peer-reviewed articles, policy documents, and implementation frameworks. The inclusion criteria specifically targeted studies that examined the implementation of AI in Australian healthcare contexts, management challenges, and preparation strategies. Data synthesis involved a thematic analysis of identified barriers, enablers, and strategic frameworks.

### RESULTS:

The review identified limited clinical AI deployment in Australian hospitals, with implementation largely restricted to medical imaging. Digital maturity assessments revealed substantial infrastructure and capability gaps, particularly in predictive analytics. Barriers to adoption included socio-technical resistance, insufficient real-world evidence, fragmented data systems, unclear governance, and funding constraints. Rural services faced additional challenges related to technical support and resource limitations. Evidence from implementation frameworks and competency models highlighted the need for structured governance, capability assessments, and targeted workforce training to close the translational gap between research and practice.

### CONCLUSIONS:

Australian healthcare managers require immediate action through capability assessments, governance establishment, and strategic planning to integrate AI effectively. Medium-term priorities involve pilot trials and investment in data infrastructure and competency development. Long-term success is dependent on scaled evaluation, policy advocacy, and sustained leadership commitment to evidence-based adoption of AI. Success will ultimately strike a balance between innovation and safety, efficiency and equity, and technological capability and human-centred care delivery.

### KEYWORDS

artificial intelligence, healthcare management, Australia, digital transformation, implementation strategy

## INTRODUCTION

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The 21st century is witnessing a profound technological transformation driven by the integration of Artificial Intelligence (AI) into healthcare systems. [1] Globally, healthcare organisations are increasingly leveraging AI for clinical decision support, diagnostic assistance, and operational optimisation. In the Australian context, however, the pace and scope of clinical AI adoption remain comparatively restrained, with real-world deployments primarily limited to specific domains, such as medical imaging. Despite the global momentum, Australian healthcare systems face persistent challenges related to digital maturity, infrastructure, and preparedness for predictive analytics, which constrain broader AI implementation. [2] Addressing these obstacles requires not only technological investment but also strategic leadership and a nuanced understanding of local healthcare environments, particularly given the varying needs of urban and rural settings. [3,4] As such, healthcare managers must navigate a complex landscape characterised by evolving regulatory frameworks, socio-technical resistance, and the imperative to maintain patient safety and quality of care, all while striving to harness the innovative potential that AI offers to healthcare delivery. [4,5]

In Australia, healthcare managers hold a critical role in determining the success or failure of AI implementation initiatives. Their strategic decisions regarding resource allocation, change management, workforce development, and planning directly impact organisational readiness and the ultimate adoption outcomes. [6] The inherent complexity of AI technologies, coupled with the conservative nature of healthcare systems and ongoing regulatory uncertainties, creates a challenging environment for effective management decision-making. [4,5] Recent assessments of digital maturity within Australian healthcare reveal considerable variation across jurisdictions and persistent weaknesses, particularly in predictive analytics capabilities. [2] These findings indicate that many healthcare organisations currently lack the foundational infrastructure and essential competencies required for successful AI implementation. In parallel, the rapid acceleration of global AI research and development [7] exerts pressure on Australian healthcare managers to act decisively, while simultaneously necessitating caution to avoid premature or poorly planned implementations.

In this context, this review seeks to identify actionable strategies for Australian managers implementing AI by evaluating prevailing trends in healthcare AI adoption, analysing key challenges faced by healthcare managers, and synthesising evidence-based recommendations tailored to the distinct landscape of Australian healthcare.

## METHODS

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A comprehensive literature review formed the foundation of this analysis, utilising a range of reputable databases, including PubMed and Google Scholar. Specific search terms, including "Australian healthcare," "artificial intelligence," "management," "implementation," and "strategy", were used to ensure a thorough and targeted exploration of the topic. The review concentrated on publications released between 2020 and 2025, drawing from a diverse mix of peer-reviewed articles, policy documents, and implementation frameworks. The inclusion criteria were stringent, focusing exclusively on studies that addressed the implementation of AI within Australian healthcare settings, management challenges, and preparatory strategies relevant to this context. To synthesise the data, a thematic analysis was employed, allowing for the identification and organisation of recurring barriers, enablers, and strategic frameworks highlighted across the literature. This approach facilitated not only an understanding of the obstacles but also the identification of actionable pathways towards effective AI integration. By distilling insights from a wide spectrum of sources, the review provided a basis for evidence-based recommendations aimed at equipping Australian healthcare managers with the knowledge and tools necessary to navigate the complex landscape of AI adoption.

To address the qualitative nature of this review and minimise confirmation bias, explicit strategies were applied. Diverse perspectives were ensured through a systematic search that incorporated literature on risks, challenges, and reasons for delayed adoption. At the same time, publication bias was countered by critically examining both implementation failures and successes. Given the predominance of healthcare AI literature from the US, UK, and European contexts, Australian-

specific evidence and policy documents were prioritised to maintain relevance. To further reduce selection bias established frameworks, such as NASSS and SALIENT, were utilised to structure the synthesis and enhance transparency.

## CURRENT TRENDS IN AUSTRALIAN HEALTHCARE AI IMPLEMENTATION

### Limited Clinical AI Deployment

Australian hospitals demonstrate remarkably limited clinical AI implementation, primarily confined to established medical imaging applications. [2] A comprehensive analysis by Van der Vegt et al. (2023) revealed that most Australian hospitals remain "effectively clinical-AI free" outside of radiology departments. [2] These contrast sharply with more aggressive adoption patterns observed in comparable international healthcare systems. [7] This implementation gap not only reflects broader challenges in translating AI research into clinical practice but also highlights that a significant portion of Australian AI healthcare research remains retrospective, failing to progress to live clinical deployments. [2] The sparse deployment extends across numerous clinical domains where AI has demonstrated proven benefits internationally, suggesting that clinical decision support systems, predictive analytics for patient deterioration, and AI-assisted diagnostic tools are mainly absent from Australian healthcare workflows. [2] This conservative approach, while potentially mitigating implementation risks, may concurrently limit opportunities for enhancing patient outcomes and operational efficiency.

### Digital Maturity Assessment Findings

Systematic evaluations of Australian healthcare digital maturity, utilising the Digital Health Indicator (DHI), expose concerning patterns that directly impede AI readiness. [6,8] Woods et al. (2022) reported significant jurisdictional variation in digital capabilities. [8] These digital maturity assessments underscore fundamental infrastructure gaps that limit the potential for AI implementation, as organisations with low predictive analytics maturity typically lack the necessary data pipeline sophistication, analytical capabilities, and technical infrastructure. The observed jurisdictional variation further suggests that AI readiness is not uniform across Australian healthcare systems, necessitating tailored approaches to preparation and implementation. [2]

### Regulation and Governance

A thorough understanding of AI regulation in Australia is essential for the effective implementation of AI in healthcare. The Therapeutic Goods Administration (TGA) adopts a risk-based, technology-neutral approach to regulating medical devices, including digital health tools, through the Software as a Medical Device (SaMD) pathway. [9] While the framework is largely considered fit for purpose, ongoing reviews aim to clarify definitions and better accommodate the unique attributes of AI. The Australian Government has committed significant funding and undertaken a legislative review to support the safe adoption of AI, prioritising mandatory safeguards in high-risk healthcare settings. [10] Simultaneously, health practitioners retain full responsibility for care quality, maintaining the 'human in the loop' principle to mitigate automation risks. In line with regulations, clinical governance plays a crucial role in ensuring the safe and accountable use of AI and digital tools. National frameworks, such as the NSQHS Standards and the National Model Clinical Governance Framework, set rigorous requirements for governance, leadership, culture, patient safety systems, and clinical performance, all of which are regularly monitored.<sup>(11)</sup> Healthcare managers must explicitly integrate AI technologies within these standards to ensure ongoing accountability and high-quality patient care as the clinical governance frameworks continue to evolve.

### Global Research Acceleration vs. Local Implementation

A Bibliometric Analysis of Global Healthcare AI Research reveals exponential growth in scholarly output, accompanied by the emergence of thematic trends, indicating rapid technological advancements. [12] D'Ascenzo et al. (2024) identified a significant acceleration in AI healthcare research publications over the past decade, demonstrating the rapidly expanding knowledge base for healthcare AI implementation. [12] However, this global research momentum starkly contrasts with the limited practical implementation observed in Australian healthcare settings. [2] This disconnect between research advancements and clinical implementation reflects broader challenges in translating healthcare technology. While Australian academic institutions and research organisations contribute substantially to global AI healthcare knowledge, the pathway from research findings to clinical practice remains underdeveloped within the Australian context.

## Rural and Regional Considerations

Australian rural healthcare stakeholders have expressed specific concerns regarding AI implementation approaches that may not adequately consider local contexts and resource constraints. Kooroo et al. (2024) cautioned against "shortcuts" and "false economy" approaches to AI implementation that fail to account for the unique challenges of rural healthcare delivery. [3] Rural healthcare managers face additional hurdles, including limited technical support infrastructure, smaller patient populations available for AI model validation, and constrained financial resources for technology investments. These factors necessitate careful consideration of AI implementation priorities and approaches that may differ significantly from those in urban healthcare settings. [3,13]

## MANAGEMENT CHALLENGES AND IMPLEMENTATION BARRIERS

Healthcare managers consistently encounter several complex socio-technical and infrastructural barriers to AI implementation:

- **Socio-Technical Resistance:** Resistance to AI implementation often arises from clinical staff and other stakeholders who express concerns about workflow disruptions, professional autonomy, and the reliability of the technology. (14) Brommeyer et al. (2024) identified resistance as a dominant theme in qualitative studies on digital health transformation in Australia, manifesting as reluctance to change established workflows, scepticism about AI model accuracy, and worries about automation's impact on clinical decision-making. [14] Addressing this resistance requires sophisticated change management approaches that tackle both rational concerns about AI performance and emotional responses to technological change. [13]
- **Trust and Evidence Gaps:** A significant barrier to trust for both clinicians and managers is the lack of robust real-world evidence for AI performance within Australian healthcare contexts. [2,15,16] Most AI healthcare research remains retrospective, with limited prospective evaluation and virtually no infrastructure for "silent trials" to test AI systems in live clinical environments before full implementation. [2] This evidence gap complicates informed decision-making regarding AI adoption and raises ongoing concerns about model performance across diverse patient populations. Trust issues are further compounded by the "black box" nature of many AI algorithms, which offer limited transparency regarding their decision-making processes. [17] Healthcare managers must weigh the potential benefits of AI against the risks associated with deploying systems lacking precise explanatory mechanisms and comprehensive local validation. [15,16]
- **Resource and Infrastructure Constraints:** Australian healthcare organisations face considerable resource constraints that impede their capacity for AI implementation. [14] These include inadequate funding for technology investments, insufficient technical expertise within healthcare teams, and limited access to specialised AI implementation support. The absence of a standard prospective evaluation infrastructure particularly restricts organisations' ability to conduct appropriate testing before clinical deployment. [2] Infrastructure challenges extend beyond financial resources to encompass data management capabilities, interoperability standards, and technical support systems. [14] Many organisations lack the sophisticated data pipelines necessary for AI implementation, with inconsistent electronic medical record integration and siloed information systems reducing the feasibility of comprehensive AI deployment. [2]
- **Governance and Regulatory Uncertainty:** Healthcare managers must navigate unclear regulatory approval pathways, liability frameworks, and reimbursement models, which create additional barriers to implementing AI. [4,5,13] The regulatory landscape for healthcare AI is continually evolving, providing limited guidance for managers seeking to understand compliance requirements and risk management obligations. This uncertainty complicates the development of comprehensive implementation strategies and can lead to conservative approaches that hinder the adoption of beneficial AI. Governance challenges also involve establishing appropriate oversight mechanisms for AI systems, defining accountability structures for AI-assisted clinical decisions, and developing policies for ongoing monitoring and quality assurance. (13) Managers require clear frameworks to address these governance issues while maintaining organisational flexibility for technological adaptation. [5,16]
- **Data Quality and Interoperability Issues:** Poor data quality and limited interoperability between healthcare information systems pose significant barriers to the successful implementation of AI. [14] Many Australian healthcare organisations struggle with inconsistent data collection practices, incomplete patient records, and fragmented information systems, which collectively prevent the comprehensive data integration essential for effective AI

deployment. Addressing these data challenges necessitates substantial investment in data management infrastructure, standardisation processes, and quality improvement initiatives before AI implementation can succeed. (5,16) Healthcare managers must prioritise data governance and interoperability improvements as foundational elements of AI readiness, acknowledging that these investments, while not always providing immediate visible returns, are crucial for long-term success. [5,16]

## **STRATEGIC PREPARATION FRAMEWORKS AND MANAGEMENT COMPETENCIES**

### **Implementation Framework Comparison**

Healthcare managers can significantly benefit from structured implementation frameworks that offer systematic approaches to AI adoption. Three prominent frameworks offer complementary strengths: SALIENT (end-to-end AI implementation stages) [19], NASSS (Non-Adoption, Abandonment, Scale-up, Spread, Sustainability) [13], and targeted competency development approaches (14,20). The SALIENT framework provides a practical roadmap for staged AI evaluation, emphasising the importance of silent trials and standardised reporting throughout the implementation process. [19] It guides managers through problem definition, retrospective analysis, prospective testing, pilot implementation, and complete rollout phases, with clear decision points and evaluation criteria at each stage. The NASSS framework offers a socio-technical lens for analysing implementation challenges and opportunities. [13] This approach helps managers understand the complex interactions between technology characteristics, organisational contexts, and broader system factors that influence the success of AI adoption. NASSS particularly stresses the importance of considering sustainability and scalability from the initial planning stages.

### **Management Competency Development**

Successful AI implementation initiatives necessitate that healthcare managers possess specific digital and AI-related competencies.[14,15] Brommeyer et al. (2024) developed a conceptual framework for health service managers' digital competencies, highlighting the importance of technical understanding, change management skills, and strategic planning capabilities.[14] These competencies extend beyond basic digital literacy to include a sense of AI technologies, data analytics, and the ability to evaluate AI system performance and risks. Competency development must be tailored to specific management roles and responsibilities, with senior executives requiring strategic oversight capabilities, while operational managers need detailed implementation skills. [20] Training programs should integrate theoretical knowledge with practical application opportunities, such as case studies, simulation exercises, and mentoring relationships with experienced leaders in AI implementation. [14,20]

### **Organisational Readiness Assessment**

Successful AI implementation hinges on a comprehensive organisational readiness assessment that examines technical infrastructure, workforce capabilities, governance structures, and cultural factors. [8,15,16] The Digital Health Indicator offers a structured framework for systematic capability assessment, exploring areas such as governance, workforce, interoperability, and analytics maturity.[14] Healthcare managers should conduct regular readiness assessments to pinpoint specific gaps and prioritise improvement initiatives.[5] These assessments must consider not only technical capabilities but also organisational culture, change management capacity, and stakeholder readiness for AI adoption.

### **Stakeholder Engagement Strategies**

Effective AI implementation demands sophisticated stakeholder engagement strategies that address the concerns and interests of diverse groups, including clinicians, patients, administrators, and external partners. [8,5,16] Healthcare managers must develop communication approaches that foster trust, provide transparent information about AI capabilities and limitations, and create opportunities for meaningful participation in the implementation planning process.[8,16] Stakeholder engagement should commence early in the planning process and continue throughout the implementation and evaluation phases.[6,5] Clinical champions play a crucial role in promoting peer support and addressing professional concerns about AI adoption. Furthermore, patient and consumer representatives offer essential perspectives on the acceptability and potential impacts of AI implementation on care experiences.

## DISCUSSION

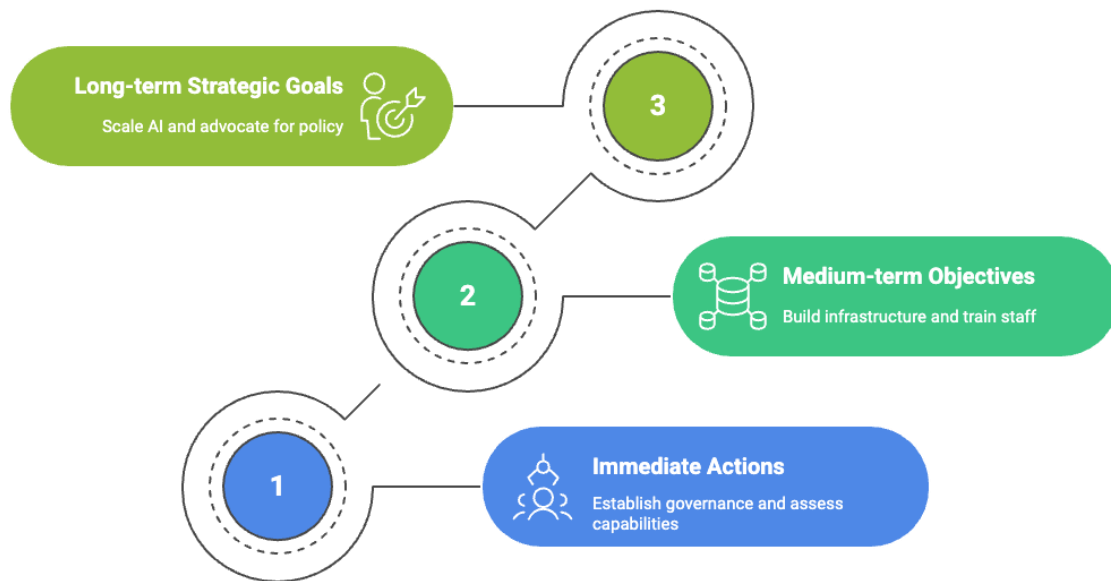
Implementing artificial intelligence in Australian healthcare settings requires a deliberate and methodical approach that considers not only the significant promise of AI technologies but also the numerous practical limitations encountered in real-world scenarios. [5,15,16] Unlike some of its international counterparts, Australia faces distinctive challenges, particularly in infrastructure development and the strategic planning required for large-scale digital innovation.[2] These factors contribute to a comparatively slower pace of AI adoption. Healthcare organisations should carefully assess risks and ensure clear value before implementing new initiatives, despite the potential for better outcomes and efficiency. An ambiguous value proposition or reliance on immature technology can result in failed implementations, ultimately threatening organisational trust and hindering future efforts to integrate AI solutions effectively. [15,16]

## RECOMMENDATIONS FOR PRACTICE

To address the identified challenges and facilitate successful AI integration, Australian healthcare managers should pursue a staged approach with clear priorities:

- **Immediate Actions (0-6 months):**
  - **Comprehensive Capability Assessment:** Utilise established frameworks like the Digital Health Indicator [8] to identify specific organisational strengths and gaps across governance structures, workforce capabilities, technical infrastructure, and analytics maturity. This provides a clear baseline for improvement planning.
  - **Define AI Implementation Priorities:** Employ structured approaches to identify high-value, low-risk use cases with clear success metrics. <sup>(2,18)</sup> This prioritisation process should actively involve clinical stakeholders, consider patient safety implications, and align with broader organisational strategic objectives.
  - **Establish Governance Structures:** Create multidisciplinary AI governance groups comprising clinical champions, information technology specialists, legal advisors, and consumer representatives. <sup>(18)</sup> These groups are responsible for establishing clear policies and procedures for evaluating, implementing, and overseeing AI.
- **Medium-term Objectives (6-18 months):**
  - **Partnerships for Evaluation:** Secure partnerships and resources to conduct prospective and silent evaluations prior to clinical rollout, using standardised reporting guidance to ensure comprehensive assessment. [15,16]
  - **Investment in Data Pipeline Infrastructure:** Prioritise improvements in interoperability and data quality processes. [2,6] These investments will support robust AI performance while delivering immediate benefits for current operations.
  - **Targeted Training Programs:** Implement management and staff training programs based on established competency frameworks and organisational needs. [14,20] These programs should combine theoretical knowledge with practical application opportunities and provide ongoing support for skill development and maintenance.
- **Long-term Strategic Goals (18+ months):**
  - **Systematic Scaling and Evaluation:** Move from small-scale pilot implementations to comprehensive deployment only after establishing clear evidence of safety, effectiveness, and equity impacts, supported by continuous evaluation and evidence generation. [2,7]
  - **Policy Advocacy:** Healthcare managers should leverage local evaluation results to advocate for jurisdictional investment in shared evaluation infrastructure and regulatory clarity. [6,15] This advocacy should highlight the collective benefits of coordinated AI implementation support and the importance of evidence-based policy development.
  - **Sustained Leadership Commitment and Culture Development:** Embed AI considerations into strategic planning processes, performance management systems, and organisational development initiatives to ensure sustained progress and adaptation.[18]

FIGURE. 1. IMPLEMENTATION AND INTEGRATION PATH FOR HEALTHCARE AI



Both clinical and operational risks must be rigorously addressed when considering the adoption of AI. [5,16] From a clinical standpoint, key concerns include the potential for algorithmic bias, which can inadvertently exacerbate health disparities by reflecting and amplifying existing inequities within datasets.[18] There is also considerable uncertainty regarding accountability in cases of malpractice or adverse outcomes, particularly when decision-making is partly or wholly delegated to opaque AI systems.[18] Over time, clinicians may become over-reliant on automated solutions, risking a decline in their own skills and professional judgment. Operationally, the introduction of AI can disrupt established workflows, increase cognitive demands on staff, and require significant upfront investment without guaranteed financial returns. Moreover, the automation of routine tasks and alterations to workforce roles may result in diminished practical expertise and reduced empathy within patient care services. [15,18] These multifaceted challenges underscore the importance of aligning technology implementation with robust governance and ongoing support for the workforce.[18]

Given the complexity of AI integration, healthcare organisations need to avoid premature deployment, particularly when the technology is still evolving or the anticipated benefits remain uncertain. Smaller providers and those with limited resources may achieve greater gains by first focusing on foundational improvements, rather than rushing into sophisticated AI projects. The findings presented here are subject to several significant limitations. The review employed a narrative approach, which is less rigorous than systematic methods and reflects the views of a single reviewer, thereby potentially introducing bias. Crucially, the evidence base for AI in Australian healthcare remains sparse [2], forcing reliance on international frameworks that may not fully capture the unique dynamics of local systems. The wider AI literature may also reflect publication bias, with positive results more likely to be reported.[21] Rapid technological advancements mean that recent developments may have been overlooked, and the author's direct involvement in healthcare AI research, although mitigated by efforts to remain balanced, could still influence the interpretation of the findings.

The success of healthcare managers in AI implementation will ultimately hinge on their ability to strike a delicate balance between innovation and safety, efficiency and equity, and technological capability with human-centred care delivery. [18] Organisations that proactively invest in systematic preparation and strategic implementation, while remaining transparent about risks and limitations, will be optimally positioned to realise the potential benefits of AI technologies.[2,15,18] Navigating this complex environment is less like launching a spaceship (a single, perfect shot) and more like setting a highly sensitive nautical course: managers must constantly check regulatory currents, adjust the sail for

operational headwinds, and use all available navigation tools (governance frameworks) to ensure the vessel (patient care) remains safe and on course toward the distant, promising horizon of innovation.

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