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Title: Redesigning leadership for clinical AI deployment

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Abstract

Clinical artificial intelligence (AI) promises to enhance patient care, streamline workflows, and improve health outcomes. AI tools have increasingly been integrated into a variety of healthcare settings. Despite rapid adoption, there is limited understanding of which leadership and organizational paradigms can best support effective AI implementation in clinical settings. This article examines frameworks of organizational culture and leadership structures that can help guide the advancement of clinical AI.

Introduction

Artificial intelligence (AI) is increasingly being integrated into clinical environments, ranging from electronic health record documentation and patient messaging to precision therapeutics and rare disease drug discovery [1]. AI tools in healthcare span a range of categories, including clinical applications, direct-to-consumer tools, and business operations [2,3]. Yet despite rapid adoption, a critical question remains unsettled: what sorts of leadership and teams are best equipped to steer the deployment of these tools? Much conversation has centered on model performance, ethics, and use cases, but relatively little literature has addressed the leadership and team compositions that can help scaffold AI adoption in healthcare [4].

Leadership in a changing healthcare AI landscape

A recent study by Li et al. 2025 [5] starts to address this gap, finding that clinician-led deployment of AI interventions had a significantly higher likelihood of impact as compared to technologist-led initiatives under the core assumptions that last authorship of the manuscript captures team leadership and that all authors contributed to the deployment effort. Although they control for potential confounders, including AI type, clinical setting, study design, team size, and authors' organizational leadership roles, several sources of bias may remain. These include unmeasured confounding (e.g., industry partnerships, funding source, existing data infrastructure), selection bias (e.g., clinicians may be more likely to start projects in clinically mature or previously successful environments), and publication bias (e.g., high-impact clinical journals may preferentially publish studies with visible clinician involvement), amongst others.

Leadership composition and team structure may critically alter both the efficacy and safety of clinical AI deployment. Studies have shown that groups including a clinical champion are more likely to adopt new technologies [5,6]. It is known that leadership in clinical settings impacts health outcomes, quality of care, and patient satisfaction [7–9]. Survey studies have shown that the vast majority of clinicians report no form of institutional encouragement to use AI tools, with only a

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minority reporting AI training in medical school curricula [10], though new clinical informatics fellowships have emerged. A broader view of leadership structure, beyond the clinician-led vs. technologist-led dichotomy made by Li et al, may guide the introduction of AI technologies that are scalable, responsive, and reliable.

Cultivating an AI-forward organizational culture

Management theory offers one useful framework for implementing AI. Learning organizations, defined as those where employees excel at acquiring plus transferring knowledge and where leadership promotes continuous improvement [11], can facilitate translation of AI innovations into practice. The four drives theory [12] posits that employees are motivated by four fundamental human drives at the workplace: to acquire, bond, comprehend, and defend (**Figure 1**). AI deployment should be practically aligned with these innate motivations to ensure implementation success. For instance, clinical champions can be rewarded with recognition, authorship, and professional titles (i.e., acquire); multidisciplinary teams can co-design how AI should best shape their unit (i.e., bond); the evidentiary basis of AI interventions should be adequately communicated (i.e., comprehend); and clinicians may be empowered to preserve professional autonomy by assuming new roles as AI leaders (i.e., defend).

Successful AI deployment in clinical settings may also benefit from an AI-forward organizational culture. Under the three-level model of organizational culture [13], which distinguishes among an organization's artifacts, espoused values, and underlying assumptions, it is essential these layers are aligned with an organization's long-term AI adoption goals (**Figure 1**). For instance, new task force roles, organization-wide dashboards, and redesigned clinical workflow diagrams (i.e., artifacts) must be consistent with the organization's stated goals and incentives of successful AI usage (i.e., espoused values) as well as its deeper pragmatism about AI's role as an augmentative tool in improving patient care (i.e., underlying assumptions). Purposefully designed rituals, symbols, and slogans can accelerate the on-ramp to AI deployment. At the subcultural level, the priorities of operators (i.e., clinicians), engineers (i.e., AI developers), and executives must be reconciled to ensure effective AI deployment and governance [14].

Central to these cultural factors is psychological safety [15], defined as a team climate in which members feel comfortable speaking up and taking interpersonal risks without fear of retribution or embarrassment (**Figure 1**). Teams who foster psychological safety, whether in the clinic, intensive care unit, or operating room, may be better positioned to pilot AI tools, identify workflow efficiency gains and disruptions, pinpoint safety risks, and clarify lines of accountability. Notably, psychological safety is compatible with the clear leadership structures and time sensitive decision making required in hospital practice, as it ensures concerns and

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uncertainties are raised early enough to support safe and effective action [16]. Empirical research in healthcare settings shows substantial variation in psychological safety reported by clinicians, indicating that its presence cannot be assumed and may require deliberate cultivation [16].

Rethinking leadership structure and team composition

While organizational culture may create the conditions necessary for AI adoption, the specific leadership styles that translate this culture into practice merit closer examination. Several leadership approaches offer distinct advantages depending on the clinical deployment context.

From the lens of contingency theory [17], the most effective leadership style stems from unique situational factors such as leader-member relations, task structure, and position power (**Figure 1**). For example, a task-oriented leadership style led by surgeons may be more effective when implementing AI-based decision support for acute airway emergencies. Consider a theoretical AI model that projects and vocalizes estimated oxygen desaturation times (e.g., projected SpO2 <80% in 30 seconds) during difficult intubations. A surgeon integrating this information in real-time can rapidly enact pre-defined escalation protocols, such as initiating an emergent cricothyrotomy procedure, and delegate tasks to nursing staff to effectively deploy a front-of-neck access kit. In contrast, a relationship-oriented style involving oncologists, palliative care physicians, and nurses is likely more effective for deploying AI-driven education chatbots for patients with metastatic melanoma. Here, physician-leaders can facilitate team discussions to determine how, when, and at what point in the care cycle the chatbot will be introduced to patients. Collaborative discussions weighing risks and benefits can enable shared decision-making.

A team-of-teams approach [18] proposes that leadership is distributed across autonomous, decentralized, but coordinated units (**Figure 1**). Subteams maintain a collective situational awareness (i.e., shared consciousness) within a structure rooted in trust and adaptability, while those in closest proximity to the problem are specifically granted the power to act (i.e., empowered execution) [18]. In healthcare, this may translate to clinician-led AI task forces, cross-departmental working groups, and rotating specialty leadership across deployment phases. Clinician-leaders can serve as “gardeners” who empower units to adapt AI to each department’s mission. Exemplifying a shift away from traditional departmental structure, clinical informatics departments have illustrated how this may work in practice, serving as hubs to distribute decision-making authority and execution across otherwise-siloed clinical and technical teams [19].

Effective adoption, however, also requires boots-on-the-ground leadership (**Figure 1**). Leaders must directly engage with frontline teams to assess whether a tool meets multiple relevant criteria including: clinical benefit, safety, technical security, cost-benefit return, relative

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advantage to alternative technologies, interoperability and compatibility with workflows, clinician learning curves, patient ease of use, simplicity, observability, and alignment with organizational values and priorities [20]. Leaders who are embedded in their units, cultivate group culture, bridge diverse networks of employees, engage staff, and clarify roles may be optimally situated to drive successful integration [9,21–24].

Barriers and bottlenecks ahead

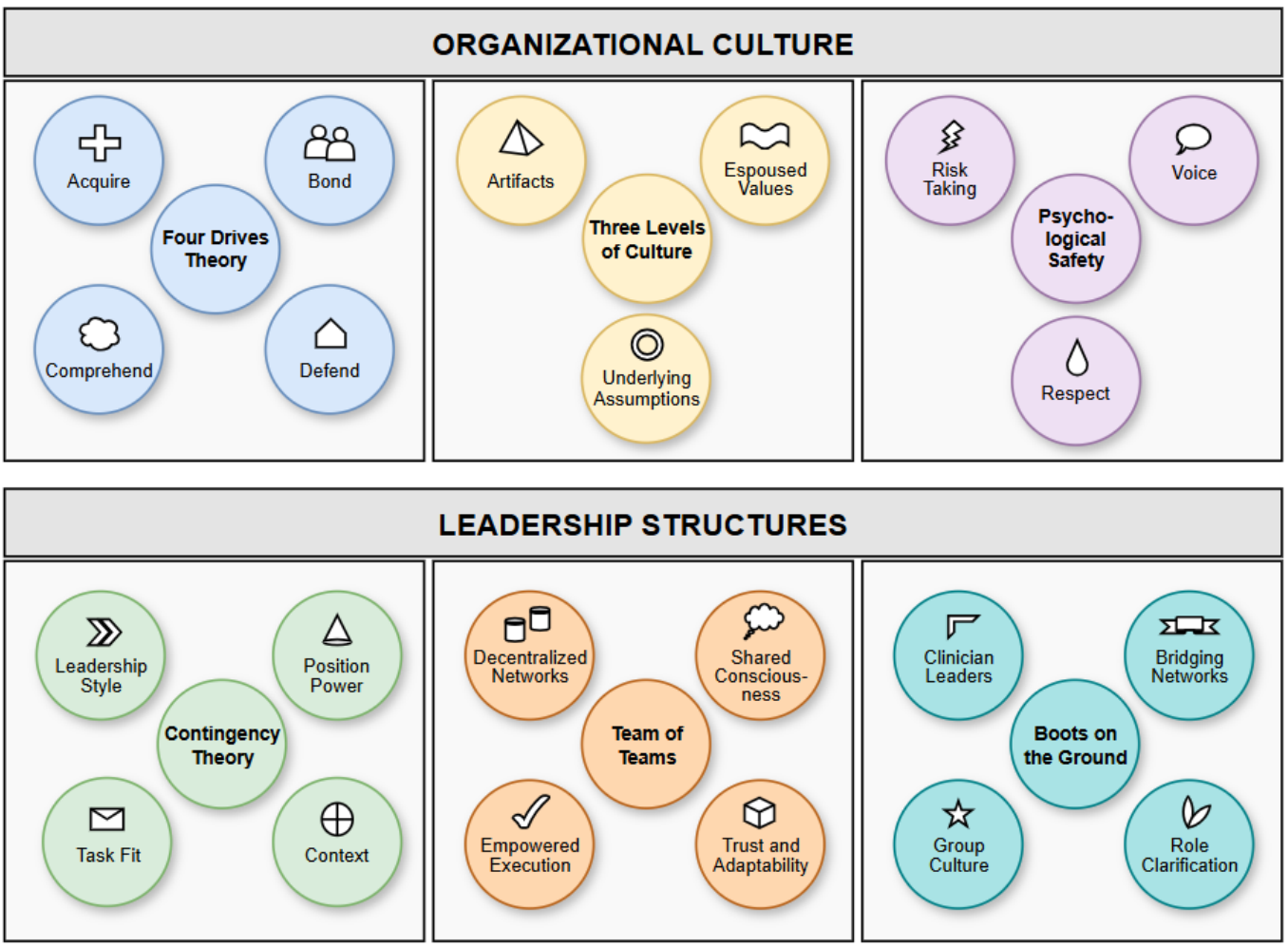
AI deployment in clinical contexts faces manifold structural challenges. Current relative value unit (RVU)-based productivity incentives reward billable encounters and procedural volume, rather than non-clinical activities such as AI deployment [26,27], which requires protected and non-compensated time for piloting, workflow redesign, integration, and training. Clinicians' concerns over reliability and professional liability may further impede adoption, particularly as regulatory frameworks are in the process of adapting and maturing. Patients, too, may fear that AI tools could erode the trust at the heart of the patient-physician relationship [28,29].

Effective leadership in AI deployment must also involve the evolution of medical education and the physician identity itself. Amidst the rising tide of AI, a straddle generation of physicians face the risk of automation bias and cognitive deskilling, mis-skilling, and never-skilling [30–32]. Burnout is a threat particularly as diagnosticians grapple with the reality that algorithms may eclipse parts of their traditional role and identity [31]. This shift presents, however, an opportunity to redefine the physician's role. Longitudinal electives, dual-degree programs, new specialty or sub-specialty tracks, and core AI competencies embedded in training pipelines can prepare physicians to lead clinical AI effectively [31,33]. Emphasizing critical thinking and physician autonomy is critical in this process.

Conclusion

Clinical deployment of AI tools can leverage the expertise and human relationships of healthcare providers. When deployed within the scaffolds of thoughtful leadership design, supported by an AI-forward organizational culture, and driven by embedded clinician-leaders, these tools have the potential to revolutionize healthcare.

< Figure 1. Frameworks of organizational culture and leadership for clinical AI deployment >



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Author Contributions

TSA developed the concept, drafted the manuscript, and revised the final version. AM contributed to the drafting and editing of the manuscript. DP provided oversight throughout the project. All authors read and approved the final manuscript.

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