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Moving beyond ROI: A Strategic Governance Framework for Value Realization in Healthcare Technology Investments

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Abstract

The systemic failure to optimize multibillion-dollar annual investments in healthcare technology poses a significant threat to organizational sustainability and patient equity. Healthcare information technology (HIT) executives who lack robust investment optimization frameworks risk compromising both operational efficiency and institutional resilience. This qualitative study explored the strategic approaches technology leaders use to align financial investments with enhanced patient experiences and equitable service access. Through a reflexive thematic analysis of interviews with nine senior healthcare executives and a synthesis of industry data, this study identified four critical pillars for success: (a) institutionalizing strategic investment governance; (b) implementing iterative, evidence-driven value realization cycles; (c) prioritizing human-centric design and clinical workflow integration; and (d) operationalizing digital equity as a core business strategy. A central finding suggests that leaders must pivot from traditional, narrow, financial return-on-investment (ROI) metrics toward a multidimensional "Value-on-Investment" (VOI) framework that accounts for broader stakeholder outcomes. Beyond fiscal efficiency, the findings suggest that strategic technology stewardship can bridge the digital divide for marginalized populations, bolster workforce sustainability, and ensure high-quality, inclusive care delivery.

Keywords

Healthcare Information Technology (HIT), Strategic Governance, Value on Investment (VOI), Digital Equity, Social Determinants of Health (SDoH), Clinician Burnout, Triple AIM, Quadruple AIM, Quintuple Aim

1. Introduction

Ineffective optimization of the billions of dollars spent annually on healthcare

technology threatens the sustainability of healthcare systems and exacerbates inequities in patient access. Despite healthcare accounting for nearly 20% of U.S. gross domestic product, with an estimated $4.5 trillion in annual spending, only about 5% of hospital budgets are typically allocated to information technology (IT), compared to 7% - 10% in industries, such as banking or retail (Yao et al., 2022). Poorly optimized investments in healthcare information technology (HIT) contribute to fragmented care, data silos, and inefficient workflows, resulting in tens of billions of dollars in avoidable healthcare spending annually in the United States (Padula & Pronovost, 2024). Without more effective investment strategies, healthcare organizations risk falling short of achieving critical aims such as improving patient experience, promoting health equity, and addressing the social determinants of health (SDoH).

Moreover, inequities in technology deployment exacerbate disparities in access to care; for example, low-income and minority populations are 40% less likely to benefit from digital health innovations due to gaps in infrastructure and strategic alignment (Yao et al., 2022). Without more effective investment strategies, healthcare organizations risk falling short of achieving critical aims, such as improving patient experience, promoting health equity, and addressing the social determinants of health (Nundy et al., 2022). This research explored the effective strategies used by healthcare technology leaders to optimize technology investments that strengthen the patient care experience and advance equitable access to care.

2. Literature Review

The healthcare industry has undergone a significant transformation in recent years, primarily driven by the rapid evolution of HIT and growing demands to enhance equity, efficiency, and care quality (Padula & Pronovost, 2024). This review synthesized the empirical and theoretical literature from 2020 to 2025 on effective strategies healthcare technology leaders employ to meet these aims.

2.1. Historical and Regulatory Drivers

Regulatory mandates and systemic pressures have significantly accelerated digital transformation within the healthcare sector (Nundy et al., 2022). Legislators enacted the Health Information Technology for Economic and Clinical Health (HITECH) Act (2009) and the Affordable Care Act (ACA) (2010) to modernize the United States healthcare system. For example, the HITECH Act provided significant financial incentives, allocating approximately $30 billion, to encourage healthcare providers to adopt and demonstrate meaningful use of electronic health records (EHRs; Eastburn et al., 2024). Furthermore, the implementation of the ACA facilitated a healthcare environment prioritizing care efficiency, coordination, and quality reporting. While **EHR** adoption rates increased from 10% in hospitals before 2009 to over 90% by 2017, this rapid implementation often prioritized compliance over strategic value.

2.2. Contemporary System Vulnerabilities and Resilience

The COVID-19 pandemic exposed vulnerabilities in traditional care delivery models and accelerated the adoption of HIT, including remote monitoring, telehealth, and integrated data platforms (Nundy et al., 2022). These events demonstrated the consequences of inadequate digital infrastructure and planning. Contemporary market analysis from Deloitte (2024) indicates that healthcare leaders are now navigating significant "headwinds," including inflationary pressures and labor shortages, which necessitate more resilient digital infrastructures. In response to these challenges, leaders are prioritizing investment strategies that strengthen "everyday resilience", the capacity to handle day-to-day challenges like staffing shortages and patient surges without collapsing. Baret et al. (2023) argued that leaders must identify optimal investment levels that prioritize critical assets, ensuring that capital allocation directly minimizes patient waiting times and travel distances even during periods of stress. Without such granular planning, investments may fail to mitigate the "ripple effects" of local disruptions, leading to fragmented care. Furthermore, reports from KLAS Research & Bain & Company (2024) reveal that global HIT spending is increasingly prioritizing integration and AI over "net-new" software acquisitions, reflecting a transition from expansion to optimization.

2.3. The High Cost of Misalignment and Waste

The United States spends more on healthcare than any other country, yet significant portions of this spending are classified as waste (Shrank et al., 2019). Shrank et al. (2019) estimated that $760 billion to $935 billion in annual U.S. healthcare spending is waste, with potential savings achievable through better alignment of investments with high-value care delivery. Technology misalignment contributes to both overtreatment and administrative inefficiencies. For example, 72% of physicians in the U.S. admit to prescribing unnecessary tests at least once a week, often facilitated by unoptimized digital workflows (Su et al., 2023). Furthermore, healthcare spending growth varies widely across states, driven by inconsistent Medicaid expansion and income levels, necessitating context-specific investment strategies (Johnson et al., 2022).

2.4. Conceptual Frameworks: From Triple to Quintuple Aim

The conceptual foundation for this project is grounded in the evolution of Berwick et al.'s (2008) triple aim of healthcare framework into the quadruple aim of healthcare and, subsequently, the quintuple aim of healthcare, incorporating explicit attention to workforce well-being and health equity alongside principles from SDoH. See **Figure 1**.

- The triple aim of healthcare foundation: This involves simultaneously pursuing three goals: enhancing patient care experience, improving population health, and reducing per capita costs.
- Expanding to the quadruple aim of healthcare: Bodenheimer and Sinsky (2014) proposed a fourth aim to improve the work-life of healthcare providers to address widespread professional burnout.

- The quintuple aim of healthcare and health equity: Nundy et al. (2022) added a fifth aim to advance health equity, emphasizing that quality improvement without a focus on disparities may unintentionally exacerbate inequities.

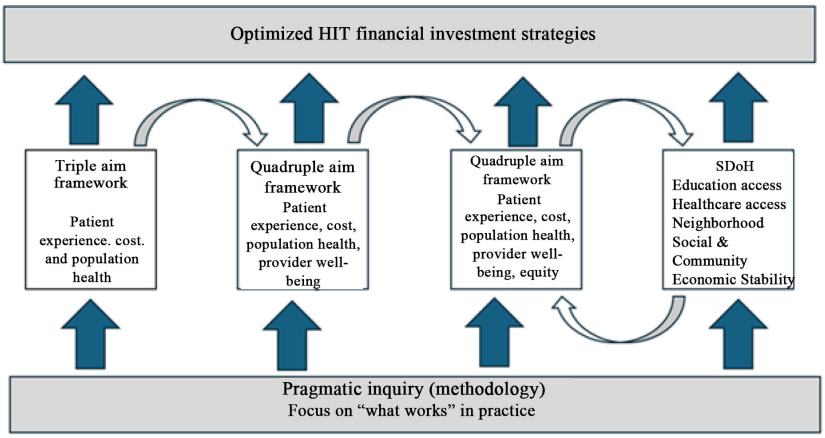
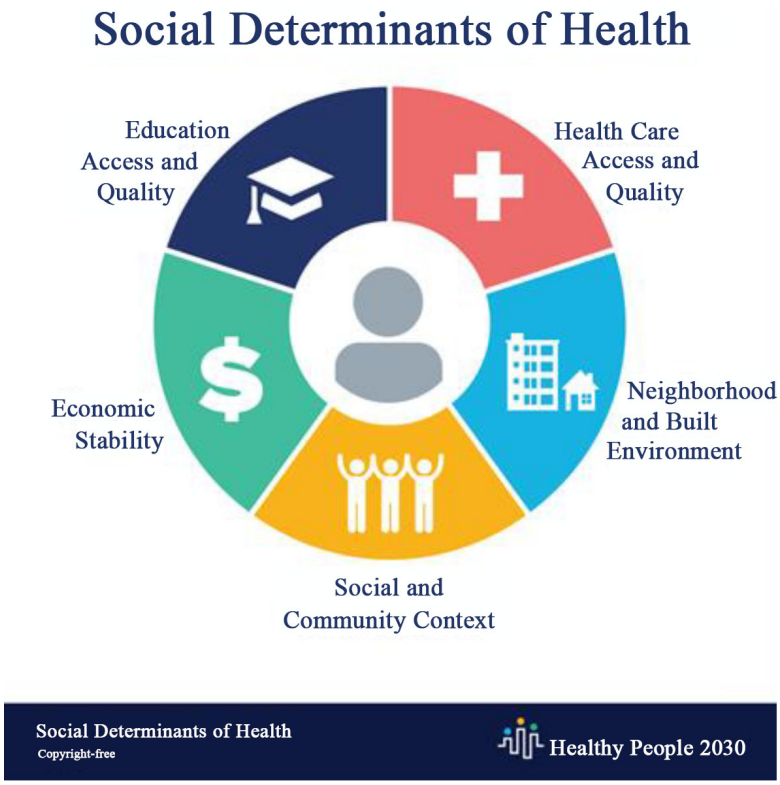


Figure 1. Conceptual framework.



Note. Healthy people 2030, U.S. department of health and human services, office of disease prevention and health promotion. https://www.cdc.gov/public-health-gateway/php/about/social-determinants-of-health.html.

Figure 2. Social determinants of health.

Social determinants of health integration: The SDoH framework highlights how income, geography, and education impact healthcare access. The philosophical

roots of this approach are found in the work of Friedrich Engels (2009), who documented the health consequences of industrial environments, and the Commission on Social Determinants of Health (2008), which established health equity as a global imperative for the 21st century. Addressing health inequities requires confronting sociopolitical structures (Mackenbach, 2009). See **Figure 2**.

3. Methods

A qualitative pragmatic inquiry research design was employed to examine the effective strategies that healthcare technology leaders use to optimize financial investments to improve patient experience and access to care. This approach supported an inductive process, emphasizing real-world problems and practical solutions based on the perspectives of the nine healthcare technology leaders.

The target population consisted of healthcare technology leaders operating within the New York metropolitan area. Eligibility for participation required holding a leadership role (e.g., CIO, CTO, or Chief Digital Officer) and having direct experience using effective strategies to optimize financial investments in HIT to improve patient experience and equitable access. Purposive sampling was used to ensure participants had the specific tacit and explicit knowledge of technology investment processes required for robust thematic analysis.

Semi-structured interviews were conducted with nine healthcare technology leaders in the New York metro area selected through purposive sampling**.** Participants were recruited through professional networks and industry associations, all of which had direct experience with AI implementation in their organizations. The researchers ensured data reliability in this project through data saturation, member checking, triangulation, and reflexivity. Member checking was conducted to confirm the accuracy of the researchers' interpretations. The researchers performed triangulation by integrating multiple evidence sources, including participant interviews, member-checking feedback, the analytic codebook, and corroborating insights drawn from established industry and global digital health reports. Specifically, the industry data synthesis involved a systematic review of reports from KLAS Research, Bain & Company, the World Health Organization (WHO), the World Bank, the Organisation for Economic Co-operation and Development (OECD), Deloitte, PricewaterhouseCoopers (PwC), the National Academy of Medicine (NAM), and McKinsey & Company. These sources were selected for their relevance to U.S. HIT investment trends between 2022 and 2025. Data from these reports were coded using the same Braun and Clarke reflexive thematic analysis framework applied to the interviews, ensuring that thematic interpretations remained anchored in both executive experience and broader industry evidence. This multi-source comparison provided further evidence of credibility and dependability of the findings. Reflexive journaling was performed to document assumptions, decisions, and potential biases. Together, the strategies helped to establish credibility, transferability, dependability, and confirmability of the research findings.

Data saturation was determined to have been reached by the sixth interview,

as core patterns consistently emerged. However, all nine interviews were completed to add nuance to the conceptual categories and ensure a comprehensive understanding across different organization types, ranging from specialty care hospitals to large integrated delivery systems. See Table 1 for participants' demographics.

Table 1. Participants demography.

Participant ID	Role/Title	Years in HIT leadership	Organization type
P1	Chief information officer (CIO)	20	Integrated care delivery system
P2	Chief information officer (CIO)	20	Integrated care delivery system
P3	Chief information officer (CIO)	28	Academic medical center
P4	Chief information officer (CIO)	23	Integrated care delivery system
P5	Chief technology officer (CTO)	24	Multihospital system
P6	Chief technology officer (CTO)	5	Multihospital system
P7	Chief information officer (CIO)	14	Academic medical center
P8	Vice president of info. tech	6	Multihospital system
P9	Chief digital officer	9	Specialty care hospital

Note. To ensure confidentiality, specific organizational names have been withheld. All participants operated within the New York metropolitan area and held budgetary or strategic influence over HIT investments at the time of, or within the past 36 months of the research project.

Data was analyzed using Braun and Clarke's (2022, 2024) six-step reflexive thematic analysis framework.

4. Results and Discussion

This section presents the four major themes that emerged from the reflexive thematic analysis of participant interviews and industry data. Each theme addresses a specific pillar of the value-on-investment framework. Unlike traditional return-on-investment (ROI), which focuses narrowly on fiscal efficiency, the VOI construct is a multidimensional framework that prioritizes clinical efficiency, clinician well-being/workforce stability, patient experience, and community-specific needs. Decision criteria within this framework shift the investment focus from procurement to proof, ensuring that capital is only committed to technologies that demonstrate empirical efficacy across these diverse stakeholder outcomes. See Ta-

ble 2. for the list of themes and the frequency of participants' responses to the themes.

Table 2. Major themes.

Major themes	Number of participants who referenced theme	Number of references made to theme
Strategic value governance of digital health investment	9	99
Value realization and evidence-driven learning cycles	9	55
Digital equity and inclusive access	9	54
People-centered design and workflow integration	9	52

Note. Frequency of references indicates the depth of data saturation achieved across the nine participants.

4.1. Theme 1: Strategic Value Governance of HIT Investments

The results of this study indicate that successful financial optimization is not a matter of finding cheaper technology but rather exercising the discipline to select the most value-generating initiatives and to reject those that lack a clear strategic mandate. Participants viewed governance as a stabilizing force in the decision-making process for HIT investments. To make this implementable, leaders should formalize multilayered committees that incorporate stakeholders from clinical, financial, and health equity perspectives. Governance mechanisms must include dynamic strategy management, with technology decisions regularly revisited to ensure ongoing relevance. Furthermore, successful governance requires application rationalization, the systematic elimination of redundant applications, to manage technical debt and maintain fiscal prudence.

- Strategic Fit: Participant 8 framed the criterion for investment: "Proactive planning and aligning of any net-new initiative to overall organizational strategy is key, and that can become the framework with which you decide what not to do".
- Collaborative Decision-Making: Stakeholder engagement was the most frequently applied code (14 times). Participants described multilayered committees and cross-functional groups as essential for building consensus around and support for investment decisions.
- The Voice of the User: Participants emphasized the importance of incorporating the perspectives of those affected by HIT investment decisions, particularly internal and external end users, including patients. Participant 4 explicitly critiqued the prevalence of top-down decision-making in the industry: "I've seen way too many top-down decisions being made without the benefit of an end-user perspective. And that end user… should also be your patients."

4.2. Theme 2: Value Realization and Evidence-Driven Learning Cycles

Leaders approached digital investments as ongoing learning processes rather than one-time project completions. Consider the implementation of ambient AI scribe technology. This technology "listens" to the conversation between the patient and the clinician and automatically populates the EHR with clinically relevant notes. In a VOI-driven ambient AI scribe pilot, the success thresholds are not purely financial; rather, they include the objective reduction of "pajama time" (after-hours documentation) and a measurable increase in clinician-patient engagement. By treating this adoption as a formal research project during the pilot phase, leaders can identify underperforming solutions and "shelve the product" before a costly enterprise-wide rollout.

- Defining Value: Participants highlighted the complexity inherent in defining "value" in healthcare technology investments, particularly the tension between tangible and intangible benefits. Participant 6 questioned whether value can be meaningfully articulated in the absence of measurable outcomes, while simultaneously acknowledging that certain intangible benefits may carry equivalent strategic significance: "If you can't explain tangible values, then is there intangible value? … There are cases where intangible examples are as good as tangible values." This reflection underscores the challenge healthcare technology leaders face in balancing quantifiable financial or operational metrics with less easily measured outcomes, such as trust, experience, and long-term organizational learning, when evaluating the return on technology investments.
- Pilots as Laboratories: Participants described the use of pilot initiatives as evaluative gatekeeping mechanisms for technology investments. Participant 2 noted that pilots functioned as controlled testing environments in which underperforming solutions could be identified and discontinued: "There were one-off cases where we figured that the pilot was not showing the results, and we shelved the product."
- Academic Rigor: Participant 3 advocated for a more scientific approach: treating HIT adoption as a "formal research project" to ensure capital is only committed to technologies with demonstrated empirical efficacy.

4.3. Theme 3: People-Centered Design and Workflow Integration

HIT initiatives frequently underperform when technologies introduce friction into clinical workflows rather than mitigating it (Woods et al., 2024).

- Reducing Burden: Participant 8 emphasized the importance of continuous iteration, describing ongoing "tweaking and refining" to ensure that technology implementations meaningfully reduced documentation burden. This finding aligns with the research of Bai et al. (2024), which explores how aligning professional strengths with psychological needs can mitigate burnout among healthcare professionals. When technology is poorly designed, it forces clinicians to prioritize data entry over patient interaction, leading to "moral injury"

where clinicians are forced to prioritize data entry over patient interaction, leading to exhaustion and a sense of professional failure.

- The "Pajama Time" Solution: Ambient documentation AI was described as a transformative intervention that passively captures clinician–patient conversations and auto-populates the EHR. By reducing after-hours documentation, often referred to as "pajama time," leaders are finding ways to restore work-life balance and enable greater clinical focus. Research by Ahmad et al. (2023) further supports the need for such interventions, noting that administrative stressors are a primary driver of burnout across various medical specialties.
- Contrarian Skepticism: Participant 3 cautioned against uncritical adoption of innovation, noting that despite expectations, digital tools have often exacerbated workflow challenges: "the opposite [of computers improving clinician lives] has happened, and that's not the fault of the tools themselves." This perspective underscores the role of implementation design, rather than technology alone, in shaping clinician experience.

4.4. Theme 4: Digital Equity and Inclusive Access Strategies

This theme reflects an intensifying concern that digital health must not privilege only those with modern devices and high digital literacy (Yao et al., 2022).

- The Digital Divide: Participants recognized that digital health access gaps mirror broader community inequities like economic insecurity and constrained work schedules, which aligns with the findings of the World Health Organization (2025).
- Market-Driven Inequality: Participant 3 offered a sharp critique, arguing that the U.S. healthcare business model causes technology to follow reimbursement streams rather than patient need: "digital tools are primarily designed for commercially insured patient populations who possess the 'ability to pay'".
- Multimodal Pathways: To mitigate the risk of a "digital caste system," organizations must offer "hybrid" access models (World Bank, 2023). Strengthening the digital equity pillar requires a shift from passive availability to equity-driven design. Organizations should adopt a minimal measurement set to track barriers to broadband internet access, digital device availability, and digital literacy. Metrics should include indicators of the "digital inverse care law" to ensure that those with the highest health needs are not receiving the lowest level of digital capacity. By measuring these outcomes, leaders can proactively design 'multimodal pathways' that include phone-based support and SMS options to ensure inclusive access for marginalized populations.

5. Business Contributions and Recommendations for Professional Practice

The findings from this qualitative pragmatic inquiry offer actionable guidance for healthcare technology executives, including Chief Information Officers, Chief Digital Officers, and Chief Technology Officers, striving to make fiscally responsible

and equitable decisions. The interpreted themes establish a digital leadership model grounded in strategic stewardship and evidence-driven learning.

5.1. Enhancing Strategic Value Governance

Leaders must formalize multilayered committees that incorporate stakeholders from clinical, financial, and health equity perspectives to ensure transparent decision-making. Strategic fit assessments should be embedded into HIT project intake processes to ensure technology decisions reinforce organizational priorities. This approach is critical for financial sustainability, as approximately 75% of health systems currently report a lack of the planning and resources needed to deliver on their digital ambitions (Eastburn et al., 2024). Organizations should further develop structured risk assessment tools that specifically address clinical, cybersecurity, and vendor maturity risks.

5.2. Institutionalizing Value Realization Frameworks

Value realization must be treated as a central practice by defining value through a multidimensional lens that includes financial returns, workflow efficiency, clinician and patient experience. This necessitates adopting iterative, pilot-based learning cycles to test usability before scaling across the enterprise. Leaders should shift from traditional "project management" toward "product management", which involves continuous measurement using both quantitative indicators and qualitative feedback (Eastburn et al., 2024). PricewaterhouseCoopers (2024) recommended that to reimagine the health ecosystem, organizations must treat digital tools as living products that require constant evolution to maintain their strategic value.

5.3. Prioritizing People-Centered Design

Since clinicians bear the practical consequences of digital decisions, leaders must treat clinician-centered design as a core business imperative. Recommendations include embedding informaticists directly into design processes and conducting workflow assessments to ensure technology aligns with clinical practice. Optimizing workflows through digital enablement can yield a 15% to 30% net time savings for nursing shifts, directly addressing global workforce shortages (Eastburn et al., 2024). Providing meaningful implementation support, such as at-the-elbow assistance, is a strategic investment in talent retention.

5.4. Advancing Digital Equity as a Business Strategy

Digital equity is an essential component of organizational sustainability and reputation. Leaders must assess barriers to broadband access, device availability, and digital literacy, and design tools and workflows that reflect these community realities. To avoid exclusion, leaders should offer multimodal engagement pathways, such as phone support and community-based programs. Measuring health equity outcomes is vital to ensuring that adoption patterns do not widen disparities (MacDonald et al., 2022).

6. Implications for Social Change

The research findings have significant implications for social change, specifically regarding disparities in digital access, clinician well-being, and community trust.

6.1. Enhancing Equitable Access to Technology-Enabled Care

Technology-enabled care has the potential to reduce disparities, but only if it is designed with inclusivity in mind. When leaders integrate equity considerations into governance and design, healthcare digital tools become vehicles for expanding access rather than reinforcing privilege. According to the Organisation for Economic Co-operation and Development (2023), implementing hybrid access models ensures that the "digital inverse care law", where those with the most need have the least access, does not become the standard of care.

6.2. Supporting Clinician Well-Being

Clinician-centered technology design contributes to social change by addressing burnout and improving work-life balance. When technology reduces cognitive and administrative burdens, clinicians can devote more attention to patient care, strengthening clinician-patient relationships. Sustaining these clinical workforces' well-being ensures that communities, particularly in underserved areas, retain access to high-quality patient-centered care.

6.3. Building Community Trust

Transparent governance and equitable design contribute to broader public confidence in healthcare institutions. When patients perceive that technology is designed with their realities in mind, they are more likely to engage with care systems and maintain continuity of care. Leadership strategies identified in this research foster a social contract where healthcare institutions serve as stewards of digital dignity.

7. Limitations and Transferability

This research project was constrained by its qualitative design. The focus on a small, purposively selected sample of leaders within the New York metro area may limit the generalizability of the findings to rural contexts or regions with distinct regulatory structures. Furthermore, reliance on retrospective descriptions introduces the risk of recall bias, in which participants may minimize challenges due to social desirability. While member checking and reflexivity were used to ensure methodological integrity, the rapidly evolving nature of healthcare technology means that these strategies must be viewed as part of a dynamic, ongoing leadership journey rather than a static endpoint.

8. Conclusion

The findings from this qualitative pragmatic inquiry reveal a HIT leadership model grounded in strategic governance, evidence-informed learning, and a commitment

to digital equity. To optimize financial investments, HIT leaders demonstrated decision-making processes shaped by organizational priorities and community needs. The four themes of governance discipline, value realization, people-centered design, and inclusive access reflect a socially responsible approach to digital investment. As the healthcare sector becomes increasingly reliant on HIT, these insights offer a blueprint for advancing digital maturity while protecting workforce capacity and ensuring equitable access to high-quality care for all.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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