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"From Burden to Insight: Reimagining Healthcare Quality Measurement Through Artificial Intelligence"

Imagine a healthcare system where knowledge is ambient, not burdensome. Appointments are scheduled by AI that weighs urgency, preferences, and availability. Insurance verification happens without effort. During visits, clinicians face their patients while AI listens, documents, and creates a care plan. Prior authorizations are prefilled, billing is accurate, and follow-up is proactive. This is not a distant dream but a vision already taking shape.

Today, quality measurement is slow, fragmented, and administratively heavy. Data is inconsistent, interoperability is poor, and clinicians spend hours reporting instead of caring for patients. Even answering whether quality is improving requires manual, one-off projects.

This paper explores how artificial intelligence can improve quality measurement through Avedis Donabedian's structure, process, and outcome model, both by streamlining traditional methods of measure evaluation, and by redefining areas that have been historically difficult to capture, such as care coordination, patient-centered outcomes, and near-misses. Structure includes the leadership, workforce, and data systems that enable care delivery. Process focuses on what happens throughout care, such as handoffs, follow-ups, and protocol adherence. Outcomes emphasize what is most important to patients, from clinical results to self-reported experiences.

We began by examining the current state of each domain and the gaps that limit timely action. Structures are often rigid, with governance that changes slowly, training that is not tied to performance, and siloed data systems. AI offers the chance to make these elements adaptive; governance that learns continuously, training that responds to real needs, and data that flows across systems to create a more complete picture of care.

With process, we focused on gaps that are hard to measure today such as missed follow ups, care coordination, and step therapy delays. AI can connect fragmented data across settings, alert teams before patients fall through the cracks, automate prior authorization, and flag unsafe or low-value care before harm occurs.

For outcomes, we looked at how measurement is often delayed, narrow, and disconnected from patient priorities. AI can extract data directly from clinician notes and analyze narrative feedback as it is given so that improvement efforts can happen while patients are still engaged.

Together, these ideas shift measurement from a static scorecard to a living feedback system that continuously closes the loop between structure, process, and outcomes. The goal is not to add technology for its own sake but to make measurement meaningful and actionable. AI must be co-created with clinicians and patients, deliver clear value, integrate seamlessly across systems, and be monitored to ensure it enhances safety and equity rather than creating new disparities.