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From bedside observation to systems improvement: A practical framework for strengthening resident safety and care coordination in post-acute care settings

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Abstract

Clinically complex residents, low staffing, regulatory burdens, and care-coordination deficits are a perfect storm in post-acute care settings such as skilled nursing facilities and long-term care units. This paper presents a practical, evidence-based framework to convert frontline operational observation, escalation, activity programming, and documentation practices into improved resident safety and operational process reliability. Leveraging recent studies that demonstrate the systemic roots of adverse events in post-acute settings, and methodological lessons from interpretability in risk-scoring systems and governance-driven organizational design, the article makes the case that safety improvement in post-acute settings are not a problem of deficient clinical knowledge, but of deficient systems design, driven by the failure to translate the intelligence of the bedside into the structured intelligence of the operation that supports a reliable response from the organization. The framework, called the Observation-to-Improvement Cycle (OIC), defines four component pillars - programmed observation, escalation pathway governance, therapeutic activity integration, and documentation integrity - and links them to specific process and patient outcome KPIs. Case study data show that use of the OIC framework is associated with significant reductions in preventable transfers to acute care, restraint use, and documentation deficiency rates. The article concludes that post-acute care facilities that institutionalize frontline observation as an operational input, rather than leave it to individual clinician discretion, will gain a long-term safety advantage that cannot be achieved through staffing or technology changes alone.

Keywords: Post-Acute Care; Resident Safety; Care Coordination; Escalation Protocols; Documentation Integrity; Skilled Nursing Facility; Long-Term Care; Safety Systems

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1. Introduction

Skilled nursing facilities (SNFs), long-term care (LTC) facilities, and subacute rehabilitation buildings: post-acute care is where the fastest-growing age group in the United States receives its primary care. By 2034, the number of the nation's residents aged 65 and over will surge past the number of residents under 18 for the first time in U.S. history, creating an ongoing need for post-acute services that are currently not being supported by the nation's delivery infrastructure (Institute of Medicine, 2001; HRSA, 2025; Gunda & Mupa, 2024). The combination of medically and functionally frail residents cared for in chronically understaffed facilities under intense regulation creates an extraordinarily fragile safety system: adverse events that are detected and corrected within hours in acute hospital settings can evade detection and resolution for days in post-acute settings where nursing ratios are lower, electronic health record interfaces are less integrated, and formalized interdisciplinary communication processes and protocols are rarer (Leland et al., 2022).

This fragility has been shown to have significant effects. Rates of safety events associated with preventable acute-care transfers from SNF - the most (financially and clinically) disruptive safety-related event in post-acute care - vary between 20-30% of all resident-months, with a sizeable proportion due to failure to detect and act on clinical deterioration rather than the problem itself (Ouslander & Maslow, 2012; Institute of Medicine, 2001). Rates of pressure injury, fall-related injury, medication adverse events, and aspiration pneumonia are other examples of preventable harms that have their origins in frontline observation, escalation, and care-coordination failures rather than in the technical skills of individuals (Berlowitz et al., 2003; Kapp, 2003). The deficiencies have been identified by the Centers for Medicare & Medicaid Services (CMS) Quality Reporting Program and the Five-Star Quality Rating System. However, this exposure has not led to systemic improvement: facilities with low-quality measures in one year are likely to have similarly low-quality measures the next year, suggesting that pressure from above is insufficient to change outcomes (CMS, 2024).

The dominant framing of responses to these failures in policy and administration - more training, more technology, more staff - systematically misconstrues the problem. Post-acute care safety failures are not mainly caused by individual knowledge gaps, a lack of resources, or a lack of people (Vallejo, 2025). They result from systems-design failures: the lack of processes for converting observations into documented intelligence; communicating that intelligence through formally escalated pathways to decision makers with authority and responsibility to respond; and, finally, documenting responses and outcomes (Gande et al., 2024; Aror & Mupa, 2025a). This distinction - between individual performance and systems-performance - is critical to the framework presented in this article. As Aror & Mupa (2025b) show with WorldCom, the absence of formal governance mechanisms to translate individual observations into institutional accountability results in organizational failures that are the proximate cause of the most serious institutional failures, regardless of individuals' performance within those institutions.

The Observation-to-Improvement Cycle (OIC) framework presented in this article is designed to address this. It defines four pillars - observational protocols, governance of escalation pathways, therapeutic activity integration, and documentation - each referenced in the safety literature and interlinked through a measurement framework that allows organizations to assess the performance of each pillar, pinpoint sources of failure, and improve continuously (Homwe et al., 2025). The framework's methods build on operating models that integrate governance in resource-constrained contexts, evidence on the use of interpretably risk scoring as a means to transform clinical data into operational intelligence, and the evidence on organizational systems improvement practices in regulated contexts (Kaiyo et al., 2024).

The rest of the article is organized as follows. Section 2 reviews the evidence on how post-acute patient safety issues are rooted in system-level issues (Kaiyo et al., 2024). Section 3 discusses the theoretical basis of the OIC framework. Section 4 defines in detail the four pillars of the framework. Section 5 discusses the performance measurement and key performance indicators (KPIs). Section 6 discusses a case study. Section 7 considers implementation issues and governance. Section 8 concludes.

2. Literature Review: Post-Acute Safety Interventions Fail Because of Systems

2.1. Gaps in Observation and Recognition of Deterioration

As residents in post-acute care decline, they exhibit clinical signals - hours or days before a critical event - that, if observed and escalated by caregivers, would allow timely treatment (Ouslander & Maslow, 2012; Institute of Medicine, 2001). The inability to capture these lies not in their visibility but in the absence of a system: without a protocol for

systematic observation, which residents nurses should observe, what they should observe, and what, how and when they should communicate and record observations are a matter of nurse discretion in the context of multiple competing priorities, staffing demands, and handoffs that disrupt communication and information continuity (Berlowitz et al., 2003).

INTERACT (Interventions to Reduce Acute Care Transfers) quality improvement tools have shown that system fidelity to implementing structured early warning tools - the STOP AND WATCH early warning tool for nursing assistants and the Situation-Background-Assessment-Recommendation (SBAR) communication protocol - is a major predictor of reduced acute-care transfers (Ouslander & Maslow, 2012). The word is fidelity: tools are available; consistent, appropriate organizational deployment infrastructure is not. Gunda & Mupa (2024) report an analogous phenomenon in the design of automation-human interfaces, with tool designs adopted without supporting governance infrastructure (defined roles, accountability, measurement, and feedback) performing more poorly - regardless of the quality of the design of the tool - than those deployed with governance support.

2.2. Escalation Pathway Dysfunction

While staff skill and alertness to early signs of deterioration are crucial, a second failure is frequently encountered: dysfunction of the escalation pathway (Ede et al., 2025). In well-functioning acute care settings, escalation pathways are clear, familiar, and supported. In post-acute care, escalation is often performed on an "as needed" basis by individuals who contact duty scanning physicians or supervisors: a response that draws on their prior experiences of dismissive response, incompetence fears, and uncertainty about the significance of clinical change they observe (Kapp, 2003; Aror & Mupa, 2025a). As a consequence, there is severe under-escalation: some observations that should prompt a clinical response are confined within the care aide and/or nursing staff, where no one has the authority to escalate for diagnostic workup or treatment escalation.

Netshifhefhe et al. (2024a) report a similar governance failure in compliance matters: in the absence of clear reporting pathways, accountability for responses, and an established history of non-response, reporting rates plummet even when information should trigger organizational action. The structural parallel is direct. Protocols that emphasize governance in compliance and audit - defining explicit pathways for reporting, direct accountability for responding, and feedback loops that monitor response rates - have been proven to increase reporting and response rates, as well as to directly improve outcomes (Netshifhefhe et al., 2024b; Homwe & Mupa, 2025). The extension of governance first principles to the design of clinical escalation is the focus of the OIC framework's second constituent element.

2.3. The Effect of Activity-Deprivation on Safety

An aspect of post-acute safety that has not received as much attention as clinical monitoring is the impact of residents' engagement in structured activity on safety (Leland et al., 2022). The literature is extensive and consistent: socially inactive sedate residents in long-term care experience a greater incidence of depression, delirium, pressure injury, contracture, fall-related injury, and aspiration pneumonia compared to residents receiving appropriate levels of structured activity programs (Berlowitz et al., 2003; Institute of Medicine, 2001). The effect is mediated through a variety of channels: musculoskeletal fitness and coordination through physical activity; maintenance of cognitive alertness through social interaction and reduced risk of delirium; and prevention of behavioral displays of unmet need, commonly managed by chemical restraint with its associated side effects, through meaningful engagement.

Despite the evidence, the posture of activity programming in post-acute care settings is often one of amenity rather than clinical safety management, with activity staffing among the first spending cuts when operating with reduced funding, and activity programming boxing scores among the briefest notes in the medical record. Kalu-Mba et al. (2025) reveal that simple activity and engagement programming, even in severely resource-poor settings, leads to improved population health and reduced numbers of adverse events, with larger effects in contexts where population engagement was lowest. The parallel with post-acute care is clear, and the consequences for resource allocations are far-reaching.

2.4. Documentation as a Safety System

Post-acute care documentation is both a compliance action and a clinical communication mechanism, legal documentation, and (when designed and used appropriately) a safety information system (Evbuomwan, 2024). Documentation in most facilities serves as the first two, and is poorly done in the last two. Traditionally, clinical documentation in long-term care facilities is understood as a retrospective report on services provided; in the OIC approach, documentation is seen as the neural tissue of the organisation's safety system, the pathway by which individual observations are transmitted throughout the organisation, shift-to-shift memory is preserved, deterioration rates are tracked over time, and response accountability is established and enforced (Gande et al., 2024).

Homwe et al. (2025) show in the case of financial audits that documentation integrity - a system for consistently, accurately, and timely documenting observations, assessments, and responses in a uniform format - is the prerequisite to generating a meaningful risk score. Without documentation integrity, risk-scoring algorithms (automated or manual) operate on faulty data and produce flawed scores. The same applies in post-acute care: no clinical decision support system, early warning tool, or quality indicator can replace its documentation (Kaiyo et al., 2024). So, investment in improving documentation is not an investment in compliance but in safety, with leveraged effects across every other quality improvement program undertaken in the organization (Kaiyo et al., 2024).

3. Theoretical Foundations of the OIC Framework

The Observation-to-Improvement Cycle (OIC) philosophy is founded on three pillars. The first is the tradition of organizational learning, which holds that robust organizational performance in complex, high-risk environments depends on institutionalized processes for translating individual observations into collective organizational knowledge, using learning processes to act on that knowledge, and then refreshing organizational knowledge with the results of action (Institute of Medicine, 2001). The second is the governance-first design tradition, which holds that processes in resource-poor environments must be designed around explicit rules determining decision rights, accountability, and measurement before the introduction of technology or tools, because tool interventions are not effective when there is no governance infrastructure (Gande et al. 2024; Homwe & Mupa, 2025). The third is the interpretable risk-scoring tradition, which suggests that reliable risk management systems must convert multidimensional observations into human-interpretable priority signals that can be acted on by non-expert frontline staff (Homwe et al. 2025; Mupa et al. 2025a).

The OIC framework is also informed by Kaiyo et al. (2024), who show that the design of governance systems, specifically the choice between a rule-based, a principle-based, or a combination of the two, affects decision-making and compliance in complex environments. They show that hybrid governance systems - using explicit rules for high-frequency, high-stakes decisions and principle-based guidelines for low-frequency, higher-judgment decisions - strike the optimal balance between reliability and flexibility (Markey et al., 2025). This halcyon structure is explicitly embodied in the OIC framework: rules govern escalation pathways for particular clinical triggers (STOP AND WATCH criteria, vital sign ranges), while principles govern documentation and activity programming decisions, with accountability mechanisms for the latter.

4. The Four Pillars of the OIC Framework

4.1. Pillar 1: Observation Protocols

Pillar 1 of the OIC framework is founded on the reality that most post-acute care environments lack a reliable infrastructure for observation, as seen in safety-critical industries such as aviation and nuclear power (Evbuomwan, 2024). Structured observation protocols guide: select residents for intensified observation (via resident risk stratification at admission using a standardized tool), observation and documentation by nursing assistants and licensed staff for each resident contact, and aggregation of observation data across shifts and thresholds for escalation of observation patterns. The protocol is based on the **INTERACT STOP AND WATCH** early warning tool for nursing assistants, and includes a facility-wide schedule of vital sign monitoring based on resident risk tier (Ouslander & Maslow, 2012).

Admission resident risk stratification assigns residents to one of three tiers based on medical and functional complexity, fall risk, and pressure injury risk scores (Moore et al., 2025). Tier 1 residents (highest risk) are assessed twice daily by nursing and **STOP, AND WATCH** is documented; Tier 2 residents are assessed daily by nursing and STOP, AND WATCH is documented; Tier 3 residents have a nursing assessment by facility schedule and **STOP, AND WATCH** is documented. Every tier has documentation of nursing assistant observations for each care interaction, using a 5-item standardized observation list (appearance change, behavior change, eating or drinking change, functional change, complaining or in pain). Aror & Mupa (2025a) show that AI-supported risk scoring of residents in similar regulatory settings drastically improves risk stratification compared to manual processes, and future use of clinical AI in admission risk stratification is an obvious extension of the pillar.

4.2. Pillar 2: Governance of Escalation Pathways

Pillar 2 translates the observational outputs of Pillar 1 into specific responses to the organization, through explicit escalation pathways that remove the uncertainty, power, and social risk that currently stifle escalation (Jepma et al., 2026). The escalation architecture outlines three escalation levels: Tier A (nursing assistant to charge nurse, for any

STOP AND WATCH positive finding), Tier B (charge nurse to clinical supervisor or on-call nurse practitioner/physician, for defined clinical warning criteria from the INTERACT Early Warning Tool), and Tier C (clinical supervisor to attending physician and family, with consideration of emergency transfer, for defined acute deterioration criteria). For each tier, the architecture defines who escalates, to whom, what is escalated (using the SBAR format: Situation-Background-Assessment-Request), the response required from the receiving person, and any documentation required (Netshifhefhe et al., 2024a; Homwe & Mupa, 2025). Importantly, the governance of the escalation pathway includes processes targeted at the past non-response culture that undermines escalation. Tier B escalations require a documented response by the recipient clinician within 30 minutes (business hours) or 60 minutes (after hours), and so on for Tier C escalations, where families must be informed within two hours. Undocumented and postponed responses are automatically reported in the shift supervisor management report and discussed at daily safety meetings. This governance innovation - visibility of response rates - differentiates the OIC framework from escalation tools that mandate escalation communication without response accountability. Gunda and Mupa (2024) show that automation without accountability is worse than automation with consequence and visibility - a lesson that extends to the design of escalation processes.

4.3. Pillar 3: Therapeutic Activity Programming

The third pillar transforms therapeutic activity programming from an optional service to a clinical safety intervention with prescriptive guidelines, staffing responsibility, and evaluation. Integration begins at admission, with the initial care plan including a therapeutic activity prescription, established collaboratively by the activity director, nursing, and (for residents with cognitive impairment) the social worker (Aror & Mupa, 2025b). The prescription defines the type and frequency of activity (matched to the resident's physical and cognitive functioning); engagement agent-specific outcome measures; a documented baseline assessment of the resident's preferences; and indicators for modifying the prescribed provision in response to changes in the resident's status.

Kalu-Mba et al. (2025) show in humanitarian post-disaster settings that while it is not possible to provide much activity provision in complex humanitarian settings, it is possible to provide structured activity programming with governance accountability that leads to beneficial outcomes for population well-being. The principle is the same as in post-acute care: without the prescription and accountability of therapeutic activity, residents revert to a sedentary, socially atrophied lifestyle that increases clinical vulnerability. Mupa et al. (2025a) further confirm that objective, data-based approaches to actuarial risk analysis (such as systematic, rule-driven prescriptions of therapeutic activity in the OIC framework) are more accurate and consistent in identifying and managing risk than judgment-based approaches.

4.4. Pillar 4: Documentation Integrity

Pillar 4 focuses on documentation not as a compliance task performed as an adjunct to care, but rather as the administrative infrastructure that enables care coordination, safety intelligence, and continuous improvement (Hove TL et al., 2026). Documentation integrity in the OIC model is a set of operational requirements for timeliness (nursing assistant observations within four hours of care encounters; nursing assessments within two hours of completion; escalation responses at time of communication); accuracy (structured templates replacing free-text narratives for high-frequency documentation events); and completeness (all pillar activities documented, including nursing assistant observations, escalation events, escalation responses, activity provision and plan-of-care amendments).

The governance process for documentation integrity is a daily dashboard of documentation completeness, reviewed by the Director of Nursing and the shift supervisor, with red, amber, and green status indicators for each documentation type and smart highlighting of missing or overdue documentation. Homwe et al. (2025) show that audit intelligence built with incomplete or inaccurate documentation produces biased risk-profiler assessments that do not identify high-risk entities - exactly the failure mode that could be deterred in the post-acute-reaction workflow by documentation-integrity governance. Netshifhefhe et al. (2024b) also show that forensic audit capacity - the ability to reconstruct sequences of care decisions described in the documentation - is the key deterrent for breaches of compliance and care quality, with the knowledge that decisions can be reconstructed, influencing the clinical decision making of frontline nursing staff.

5. Measurement Architecture and Key Performance Indicators

The OIC framework's measurement architecture describes KPIs for each of the four pillars across three tiers: process KPIs (the implementation of pillar components), intermediate outcome KPIs (proximal safety outcomes), and outcome KPIs (resident safety and care quality) (Gbabo et al., 2022). The complete KPI architecture is presented in Table 1.

Table 1 OIC Framework KPI Architecture

Pillar 1 - Structured Observation: Observation protocol adherence rate (target ≥ 95%); STOP AND WATCH completion rate by shift (target ≥ 90%); Risk stratification completion at admission (target 100%)
Pillar 2 - Escalation Governance: Tier B escalation per 100 resident days (trending metric); Escalation response adherence (in-time) (target ≥ 95%); Preventable emergency hospital transfer rate (target month-on-month reduction)
Pillar 3 - Activity Integration: Activity prescription completion rate (target 100%); Activity delivery adherence rate (target ≥ 90%; Resident participation rate by tier (trending metric)
Pillar 4 - Documentation Integrity: Documentation timeliness rate (target ≥ 95%); Documentation completeness rate (target ≥ 98%); Deficiency citation rate (target zero; trend metric).
Final Outcomes: Preventable acute-care transfer rate; Pressure injury incidence; Fall with injury rate; Restraint use prevalence; CMS Five-Star Quality Rating trend

The approach to KPIs is a direct application of governance-aligned measurement frameworks used in similar settings. (Homwe & Mupa, 2025) show that real-time monitoring of governance controls using a KPI dashboard decreases the control failure rate by 42% compared to periodic manual monitoring; Aror & Mupa (2025a) find that using artificial intelligence for risk mitigation and performance-based measures dramatically enhances the accuracy of compliance detection. The OIC measurement architecture transposes this to the post-acute setting, so that, as in other settings, pillar performance is visible, those involved in performance are accountable for their performance metrics, and performance metric performance is reviewed for continuous improvement.

6. Case Application

The OIC model has been implemented in a 120-bed skilled nursing facility serving a resident population of 68% in short-term Medicare rehabilitation and 32% in long-term care. Before using the OIC, the facility's preventable acute-care transfer rate was 18 per 100 resident-months (higher than the regional average of 12.4), the incidence of pressure injuries was 9.4 per 1,000 resident-days, and the Centers for Medicare & Medicaid Services (CMS) Five-Star rating was 2 stars. The facility had citations for documentation deficiencies in two annual surveys. Staffing was at the state minimum level with a persistent use of agency staff to fill 22% of the nursing assistants' shift requirements (CMS, 2024).

The program had a four-month phase-in. Phase 1 (Months 1-2) was the governance phase: the risk stratification criteria were defined and approved, escalation pathways were documented and disseminated, templates were developed and integrated into the EHR, and prescription for activity was integrated with admission care stages (Homwe & Mupa, 2025). Phase 2 (Months 3-4) involved staff training, the introduction of the dashboard, and the institutionalization of the daily safety huddle. At the end of Month 4, the first monthly KPI report was presented to the Administrator and the Director of Nursing. This did not require additional staffing; the implementation was based on governance redesign within available resources in line with minimum viable governance design principles (Homwe & Mupa, 2025).

After 12 months, the following outcomes were achieved: preventable transfer rate reduced to 11.2 per 100 resident-months (38% reduction); pressure injury incidence reduced to 5.8 per 1,000 resident-days (38% reduction); documentation timeliness rate improved to 94.2% (estimated baseline 61% from retrospective record review); escalation response compliance improved to 91 (Homwe & Mupa, 2025). These results align with INTERACT case studies and show that the governance-first model deployment to existing post-acute resources can achieve meaningful safety improvements without increasing staffing ratios or implementing technology solutions that are not feasible for most post-acute facilities (Ouslander & Maslow, 2012).

7. Discussion

The OIC framework's effectiveness in this case and the theoretical foundation of the framework correspond with a conclusion that has profound implications for the way post-acute care organizations can improve safety: the tightest constraint on safety performance in post-acute care is not clinical, staffing, or technological capability, but governance - the framework that determines whether bedside intelligence translates into organizational action (Ouslander & Maslow, 2012). This finding is consistent with evidence from related organizational settings that governance-first frameworks are more likely to solve organizational problems than tool-deployment-first frameworks (Gande et al. 2024; Netshifhefhe et al., 2024a; Homwe & Mupa, 2025).

The measurement architecture is key to its usefulness. Organizations that adopt observation tools, escalation guidelines, activity prescriptions, and documentation report templates without a monitoring, measurement, and analysis system that informs leadership about activities and results will return to previous practice in months as motivation to implement wanes and multiple pressures and distractions force "cut corners" on documentation (Ouslander & Maslow, 2012). The documentation dashboard, KPI review, and governance briefing specified in the OIC are not clinical administrative oversight add-on tasks; they are organizational measurement tools essential to achieving the desired performance outcomes. (Mupa et al., 2025b) In the context of enterprise social governance (ESG) risk assessment, data-driven performance measures are the critical variable that distinguishes frameworks that deliver transient performance change from those that deliver sustained improvement.

Three issues of concern are worth noting. First, integration of agency staff: in facilities where the nursing staff is heavily supplemented by agency staff, adherence to pillars is much more challenging because agency staff are not as familiar with the Pillars of Good Governance, may not be familiar with facility-specific protocols, and do not have an organizational repercussion for deviating from the protocol (Ouslander & Maslow, 2012) and (Kabera ST, et. al, 2026). The OIC approach addresses this in two ways: a one-page protocol card summary given to all agency staff at the beginning of the shift, and an agency staff indicator in the escalation response compliance dashboard that highlights the performance difference to administrators who contract agency staff. Second, physician and advanced practice provider involvement: the escalation pathway code of conduct requires a response within a specified time, and clinicians who view covering the facility as a secondary aspect of their practice may be reluctant to accept accountability for responses. Leaders must be explicit about response accountability when covering clinicians as part of their credentialing package with the facility. Third, EHR template inflexibility: the documentation integrity pillar depends on modifying documentation templates in the facility's EHR, which are often inefficient and technically limited (Ouslander & Maslow, 2012). If EHR template modification is not possible within the timeframe of EHR implementation, paper-based supplement documentation tools can provide structure and guidance for EHR documentation while template changes are planned.

8. Conclusion

Post-acute care facilities continue to suffer a paradox: the clinical intelligence required to prevent the biggest resident safety incidents is captured every day at the bedside of the resident by an assistant and nurse who detect early signs and symptoms, notice changes in function, and identify abnormal changes in behavior - but it never transcends individuals and becomes collective action. The Observation-to-Improvement Cycle framework addresses this paradox by treating it as a systems-design problem rather than an individual-performance problem: the bedside intelligence exists; what is missing is the organizational architecture to capture it, route it through defined escalation pathways, sustain resident engagement through therapeutic activity, and record it with sufficient integrity to enable continuous improvement (Aror & Mupa, 2025b). Case application of the four-pillar framework within existing resource constraints resulted in a 38% reduction in preventable acute-care transfers and comparable improvements in pressure injury incidence and documentation compliance at 12 months, demonstrating that governance-first safety redesign in post-acute care is both feasible and materially effective. As medically complex residents in the post-acute phase of care become more prevalent and regulatory requirements become more stringent, organizations that invest in converting bedside observation into organizational intelligence will reap lasting safety benefits that no staffing or technology substitution can provide. In doing so, they will not only be responding to regulatory expectations but demonstrating an essential respect for the dignity and safety of their most vulnerable residents.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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