



Matters We Metric Vs. Metrics that Matter

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Abstract

Introduction: Geriatric fracture is a pressing global health issue, marked by elevated mortality and morbidity rates and escalating health care costs. The evolving health care system from fee-for-service to quality-based reimbursement has led to externally driven reward and reimbursement systems that may not account for the complexity of caring for older adults with fracture. **Significance:** The aim of this review is to highlight the need for a shift towards meaningful metrics that impact geriatric fracture care and to issue a call to action for all medical societies to advocate for national reimbursement and ranking systems that focus on metrics that truly matter. **Results:** Traditional metrics, while easier to capture, may not necessarily represent high quality care and may even have unintentional adverse consequences. For example, the focus on reducing length of stay may lead to older patients being discharged too early, without adequately addressing pain, constipation, or delirium. In addition, a focus on mortality may miss the opportunity to deliver compassionate end-of-life care. Existing geriatric fracture care metrics have expanded beyond traditional metrics to include assessment by geriatricians, fracture prevention, and delirium assessments. However, there is a need to further consider and develop patient-focused metrics. The Age-Friendly Health Initiative (4 Ms), which includes Mobility, Medication, Mentation, and what Matters is an evidence-based framework for assessing and acting on critical issues in the care of older adults. Additional metrics that should be considered include an assessment of nutrition and secondary fracture prevention. **Conclusion:** In the realm of geriatric fracture care, the metrics currently employed often revolve around adherence to established guidelines and are heavily influenced by financial considerations. It is crucial to shift the paradigm towards metrics that truly matter for geriatric fracture patients, recognizing the multifaceted nature of their care and the profound impact these fractures have on their lives.

Keywords

geriatric fracture, quality-based reimbursement, patient-centered care, metrics, hospital metrics

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Background

Geriatric fracture is a pressing global health issue, marked by elevated mortality and morbidity rates and escalating health care costs. Fractures in older adults significantly compromise patients' health-related quality of life (QOL) and activities of daily living (ADL). For example, hip fractures alone are projected to affect 4.5 million individuals worldwide by 2050 with 18-36% patients dying within 1 year, and an additional 8-13% succumbing within the initial month.¹⁻⁹ Additionally, less than half of patients with hip fracture are able to regain their pre-fracture level of ADLs.¹⁰⁻¹² With reported per-patient costs for hip fractures averaging \$50,508, contributing to an annual expense of \$5.96 billion for the U.S. health care system, the financial burden is substantial.¹³

The evolving health care system from fee-for-service to quality-based reimbursement has led to externally driven reward and reimbursement systems that pressure hospitals to meet certain goals related to patient care.¹⁴ These external pressures are employed in ranking systems and marketing strategies to influence consumer-based decision making by patients and communities. While metrics used in practice also encompass evidence-based practices such as optimal surgical timing, timely assessments by geriatricians, delirium assessment, and the use of evidence-supported treatments (e.g., Deep Venous Thrombosis (DVT) prophylaxis or implant selection etc.), the majority of metrics historically focus on process and financial aspects.¹⁵⁻¹⁸ National programs often favor these metrics due to their accessibility within electronic medical records and their perceived correlation with efficient resource allocation and superior patient care outcomes.

However, these metrics may not account for the complexity of caring for older adults with fracture that requires management beyond prompt surgical repair, including preexisting multimorbidity, baseline functional and cognitive impairment, polypharmacy, the need to include caregivers, and treatment goal preferences. Therefore, to enhance the care provided to geriatric fracture patients, we need to shift our focus to metrics that truly matter to the patients. (Figure 1).

A striking example of a missed opportunity in aligning patient-centered, evidence-based metrics can be observed in the scoring system for hip fractures by US News and World Report.¹⁹ The emphasis by this report is placed on the presence of board-certified physicians, patient experience, survival rates, and readmission rates.¹⁹ This system overlooks critical factors that matter to older patients, such as mobility (e.g., fall risk or secondary prevention), mentation (e.g., delirium), medication optimization, what matters most, and co-management.²⁰ Even more baffling is the system include measures such as the percentage of health care personnel who received a timely vaccination

during flu season.²¹ Additionally, the method used by US News and World Report to account for the complexity of patient co-morbidities through patient volume is inadequate. One of the metrics US News and World Report measure is volume (number of operations or patients).²¹ This approach may suffice for specialized orthopedic hospitals but does not translate well to geriatric patients, who often require care at quaternary trauma hospitals—a factor not considered in the rankings. This oversight may lead to an underestimation of the quality of care provided to patients with significant co-morbidities and complexities.

The aim of this review is to highlight the need for a shift towards meaningful metrics that genuinely impact geriatric fracture care and to issue a call to action for all medical societies to advocate for the adoption of relevant metrics by national reimbursement and ranking systems that focus on metrics that truly matter. Our primary focus is on the geriatric fracture patient population. However, in the subsequent discussion, we will predominantly utilize evidence and statistics concerning patients with hip fracture. This choice is made because hip fractures are the most thoroughly assessed in terms of metrics. Hip fracture encompasses ICD-10 codes S720 (fracture of head and neck of femur), S721 (perthrochanteric fracture), or S722 (subtrochanteric fracture of femur).²²

Commonly Used Metrics

Length of Stay

Length of Stay (LOS) is a widely recognized metric in health care assessment. Traditionally, a shorter LOS is seen as a positive indicator, as it implies efficient resource utilization and reduced health care costs. Hospitals have often strived to streamline processes to achieve early discharges, with the assumption that this approach benefits patient care. Nonetheless, recent studies have raised concerns about the impact of early discharge on patient outcomes, particularly when considering specific patient populations such as geriatric fracture patients.

Several previous research have drawn attention to the likelihood of complications arising shortly after patients leave the hospital as complications commonly arise after discharge for both hip and distal femur fracture patients.²³⁻³⁵ Further, an elevated one-year mortality rate was observed among older adults discharged within 10 days of their hospital admission for hip fracture surgery.²⁶

Although a shorter LOS is financially advantageous for hospitals, these findings highlight the need to look beyond just LOS and incorporate a patient-centered metric that includes quality of post-discharge care. Enhancing our ability to identify and address potential issues both before

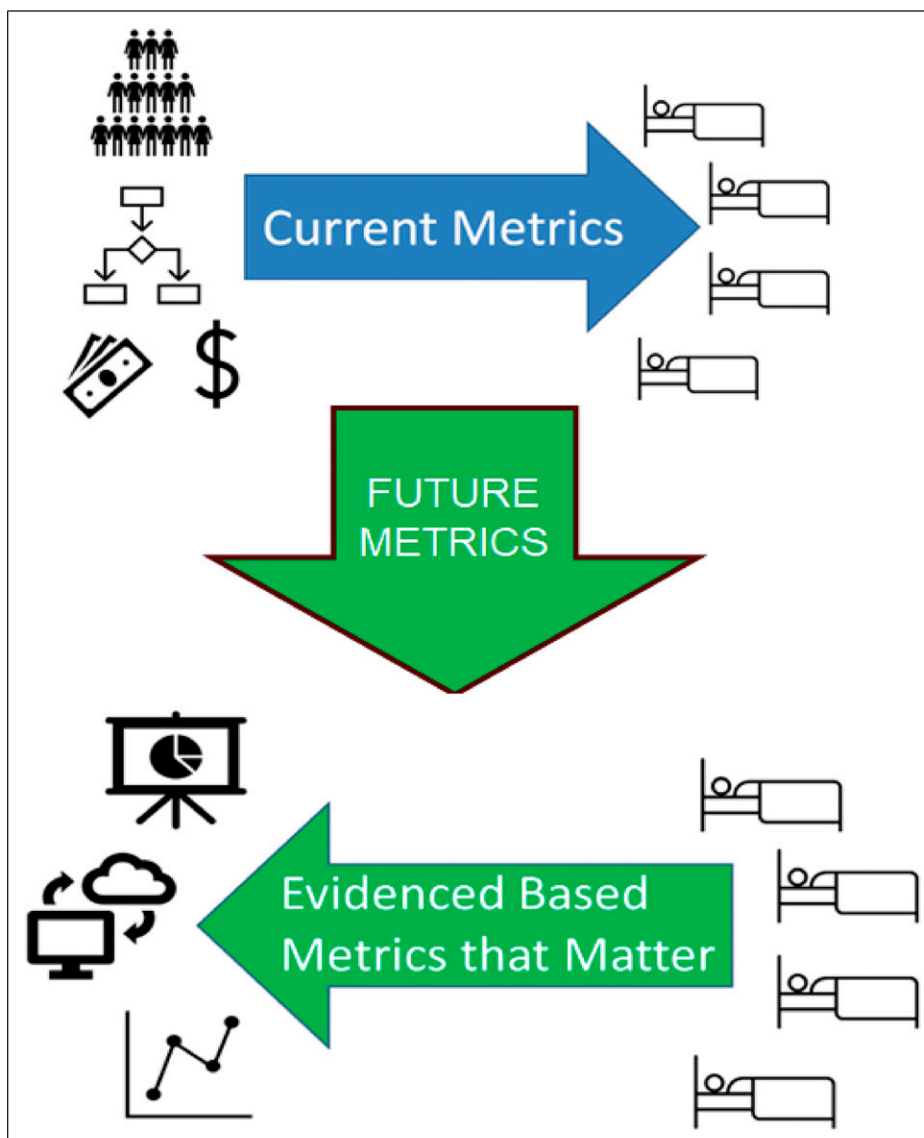


Figure 1. Future National Geriatric Fracture Metrics. Current metrics focus on people, processes and money that can be readily pulled from electronic medical records. New metrics should focus on evidence-based patient-centered metrics rather than assumptive metrics selected for ease of access to data.

and after discharge can lead to better patient outcomes while minimizing unnecessary hospitalization. Integrating LOS indices with metrics that include patient-centered high quality discharge planning is vital to find a balance between timely discharges and the prevention of post-discharge complications.

Mortality

It is important to question whether mortality rate is the relevant measure for the extremely frail individuals.^{4,9,27-32} Even the highest-risk subgroups of patients often opt for surgery in the hopes of achieving better pain control. By

solely concentrating on mortality, we may miss the opportunity to deliver compassionate end-of-life care. Indeed, an often-overlooked aspect of geriatric fracture care metrics is the consideration of palliative care and hospice patients. In these situations, metrics that evaluate the quality of palliative care, pain management, and emotional support become paramount, yet current national standards and metrics miss this opportunity.

Patient-Centered Metrics

In the realm of geriatric fracture care, the goal is to deliver care that aligns with patients' preferences, is tolerable,

purposeful, and effective. Existing hip fracture metrics, such as those outlined in the IGFS guideline and the best practice tariff (BPT), emphasize timely assessments by geriatricians, surgery within 36 hours, fracture prevention, nutrition, and delirium assessment.^{23,33,34} The American Academy of Orthopaedic Surgeons (AAOS) clinical practice guideline also includes considerations like surgical timing, DVT prophylaxis, transfusion, tranexamic acid (TXA), and surgical implants.¹⁶ While these established guidelines provide a foundation for best practices, it is essential to consider other geriatric focused metrics. Delving deeper into the metrics that directly matter to patients reveals critical aspects that may be easily overlooked in our current metrics for accreditation and award-seeking programs such as US News & World report or bundled payment goals.

4Ms (Mobility, Medication, Mentation, and what Matters)

The collaboration between the Hartford Foundation and the Institute for Health care Improvement (IHI) resulted in the Age-Friendly Health Initiative and the 4M framework, an evidence-based framework for assessing and acting on critical issues in the care of older adults across settings and transitions of care.³⁵⁻⁴¹ This 4M framework underscores the significance of comprehending and tackling what holds genuine significance for patients: Mobility, Medication, Mentation, and What Matters. Crafted by experts in aging and geriatrics alongside health system leaders, the 4 Ms offer a holistic approach to care and establish goals to ensure older adults receive optimal care, avoid harm, and are satisfied with their health care experiences.³⁵⁻⁴¹ By incorporating these broader, patient-centered metrics, health care providers may potentially better gauge the quality of care and improve the well-being of geriatric fracture patients.

Mobility

Mobility is closely linked to the recovery of functionality and independence, and plays a central role in the overall well-being of geriatric fracture patients. However, very few national systems use mobility as a critical metric in evaluating patient safety and quality for geriatric fracture care. Metrics related to mobility should include assessments of how quickly patients regain mobility post-surgery and the level of mobility achieved. Commonly utilized assessment tools include the Barthel Index (BI), Cumulated Ambulation Score (CAS), Timed "Up & Go" Test (TUG), and Functional Independence Measure (FIM).⁴² Additionally, the Activity Measure for Post-Acute Care (AM-PAC) "6-Clicks" Inpatient Short Forms offer

multifaceted metrics by utilizing six questions to evaluate the functional outcomes of patients in post-acute care settings.⁴³ These metrics could offer a comprehensive measurement of physical function specifically in the acute hospital setting for patients with geriatric fractures.

Medication Management

Diligent medication monitoring plays a fundamental role in promoting patient well-being and minimizing the risks associated with medication use. Medication reconciliation is crucial for patient safety, especially during care transitions, as evidenced by various studies. Ernst et al and Miller et al both identified discrepancies in medication records, highlighting the need for thorough reconciliation processes.^{44,45} In acute inpatient settings, discrepancies between ambulatory and inpatient care are common, with challenges including incomplete documentation and time constraints. However, standardized reconciliation processes have been shown to reduce discrepancies and save time, ultimately enhancing patient safety.^{46,47} Overall, comprehensive medication reconciliation processes are vital for promoting patient safety and reducing errors across health care settings.⁴⁶⁻⁴⁹

Age-related changes can increase the risk of medication side effects. Central to monitoring is the avoidance of high risk medications, for example, as listed on the Beers Criteria, which highlights potentially inappropriate medications, especially for older adults.⁵⁰ Avoiding medications listed on the Beers Criteria and limiting narcotics and benzodiazepines further enhances patient safety and contributes to high-quality, patient-centered care.^{50,51} Despite widespread acceptance of this concept, there are currently no established national metrics targeting goals or health system metrics that specifically address polypharmacy, reductions in medications that induce delirium or falls, or evaluate adherence to these guidelines.

Managing pain is frequently a crucial element of patient care objectives and is closely monitored in patient care. Pain not only affects a patient's immediate comfort but also plays a significant role in their ability to engage in rehabilitation and regain functional independence.⁵² Utilizing a multimodal approach, including pharmacological and non-pharmacological interventions tailored to individual needs, the goal is to achieve optimal pain management while minimizing risks associated with high opioid use in older adults.⁵³ Current national metric systems examine opioid use, yet miss the mark on fully understanding if we are adequately addressing pain for geriatric fracture patients.

Mentation

Assessing patients' mental state encompasses several critical dimensions, including identifying high-risk

patients for delirium, early detection and prevention of delirium, as well as screening for cognitive impairment and depression. Multidisciplinary collaboration among surgeons, geriatricians, psychiatrists, nurses, pharmacists, and other specialists is key to developing comprehensive perioperative management plans. Delirium, characterized by sudden alterations in attention and cognition, is common among elderly surgical patients, especially those with pre-existing cognitive impairment. The prevalence of delirium in hip fracture patients has been documented as ranging from 28% to 60%.⁵⁴ Early identification using validated screening tools like the Confusion Assessment Method (CAM) is crucial for timely intervention.^{55,56} Preventive measures, including orientation techniques, minimizing sedation, and promoting early mobilization, can help mitigate the risk of delirium.⁵⁷ Patients with dementia face an elevated risk of postoperative delirium, extended hospital stays, worse functional outcomes, difficulties in engaging therapies, and poor adherence to restrictions, when compared to those without dementia, necessitating heightened vigilance and tailored care strategies.⁵⁵⁻⁶²

Similarly, depression can exacerbate postoperative recovery. The overall prevalence of depression among older adults with hip fracture is about 20%.⁶³ Screening for depression using standardized tools such as the Geriatric Depression Scale (GDS) is crucial, as untreated depression can negatively impact surgical outcomes and overall quality of life.⁶⁴

Although we recognize the importance of these measures, national guidelines currently lack metrics to capture adherence to these protocols.

What Matters

When we treat patients with geriatric fractures, discussion should include risks and benefits of surgical and non-surgical treatment. Then, to ensure optimal decision-making regarding surgery, it is crucial to inquire about the individual's treatment goals and preferences, with a focus on factors such as efficacy, quality of life, and functional outcomes.⁶⁵

In real-life scenarios, there is a risk of either sustaining life when not consistent with goal concordant care or denying available treatments. Emergency settings pose additional challenges, as time constraints often lead to aggressive treatments being administered without considering the individual's preferences.

Addressing goals of care and advance care planning can also help ensuring that care aligns with patients' wishes. Studies suggest that advance care planning is an essential part of achieving goal concordant care. Additionally, it helps reduce anxiety, stress, and depression among patients, family, and caregivers.⁶⁶⁻⁶⁹ However, current

national metrics related to geriatric fracture care do not assess whether patients have undergone advance care planning, if their wishes are documented in medical records for implementation, or if treatment goals are being met. Future metrics that integrate advance care planning and providing goal concordant care, could transform our approach and improve quality of care.

Additional Meaningful Metrics

In addition to metrics described above, several other factors are crucial to consider for optimizing care and outcomes for geriatric fracture patients. Metrics including nutrition and secondary fracture prevention are essential for delivering holistic care that addresses the unique needs of geriatric fracture patients.

Nutrition

Malnutrition prevalence is high in geriatric patients, yet measuring it accurately remains a challenge. The Mini Nutritional Assessment (MNA) serves as a valuable instrument for identifying malnourished patients and those susceptible to malnutrition.⁷⁰ It comprises a screening segment and an assessment segment. The screening section includes inquiries regarding food consumption, body mass index (BMI), weight changes, stress, mobility, and neuropsychological issues. The assessment segment entails detailed questions about dietary habits, self-perceived nutritional and health status, as well as measurements of mid-arm and calf circumference.⁷⁰ According to existing evidence, the effectiveness of nutritional therapy as a standalone treatment for hip fracture patients is still unclear.⁷¹ A systematic review revealed low-quality evidence regarding the reduction of complications and no discernible impact on mortality.⁷² Though certain randomized controlled trials indicated enhancements in complications, pressure ulcers, wound-healing period, hospital stay duration, readmission rates, muscle strength, muscle mass, and nutritional status, others failed to identify significant differences in nutritional status or mortality.⁷³⁻⁷⁵

While it may not be the sole determinant, ensuring adequate nutrition and addressing malnutrition should be part of comprehensive care for these patients. Considering the possible impact of nutrition on patient outcomes, it is reasonable to consider incorporating nutritional assessment and intervention including dietitian consultation as one of the factors in assessing the quality of care provided by health care providers caring for geriatric fracture patients.

Secondary Fracture Prevention

Patients who have already suffered a fragility fracture are at increased risk of subsequent fractures, with up to 30% of

patients suffering a second fracture within five years.⁷⁶ The risk of subsequent fractures increases with each additional fracture, leading to a cycle of fracture and disability. To effectively manage geriatric fracture patients, prioritizing secondary fracture prevention is crucial. This involves adopting a multifaceted approach centered on fall prevention and comprehensive care.

Fracture Liaison Services (FLS) play a pivotal role in this regard, as they are structured care systems designed to identify patients with fragility fractures and ensure they receive appropriate evaluation and management.⁷⁷ However, despite the existence of such services, adherence to recommended lifestyle changes among geriatric fracture patients remains low.^{78,79} Lifestyle adjustments such as maintaining adequate intake of calcium and vitamin D, engaging in regular weight-bearing exercises, quitting smoking, and limiting alcohol consumption are advised but often not followed.⁷⁹

Furthermore, osteoporosis screening and treatment are integral components of secondary fracture prevention. Anti-osteoporosis medications (AOMs) come in various forms and are essential for managing osteoporosis effectively.⁸⁰⁻⁸³ Fall prevention strategies, including physical therapy, home modifications, and medication review, are equally vital. Physical therapy can enhance balance and gait, thereby reducing the risk of falls, while home modifications mitigate hazards in the living environment.⁸⁴

However, the efficacy of these interventions varies across studies, with some reporting positive outcomes while others find no statistically significant effect.^{85,86} One challenge lies in monitoring the effectiveness of these interventions, particularly in measuring the occurrence of actual falls among geriatric fracture patients. Falls are prevalent in this demographic, with the majority happening at home.^{87,88} Some studies have utilized fall-related 9-1-1 calls to track occurrences, offering valuable insights for prevention strategies.⁸⁹ Detailed recording of fall incidents, including location, time, activity, and patient attributes, can provide further insights for developing effective prevention strategies.⁹⁰

Implementing comprehensive approaches to secondary fracture prevention should serve as a benchmark for assessing the quality of care provided to geriatric fracture patients.

Additional Considerations

The transition from traditional metrics like mortality and LOS to more meaningful metrics (4 Ms, nutrition, fracture prevention etc.) poses challenges, primarily due to the absence of a centralized database to collect such information. While mortality and LOS are readily measurable and easily accessible, the new metrics, though arguably more reflective of quality geriatric care, require more intricate collection mechanisms and higher costs.

Practical solutions for data collection include leveraging electronic medical records (EMR) systems and an interprofessional team.⁹¹ For example, health systems have integrated the 4 Ms into the EMR. Standardized mobility (e.g., AM-PAC 6-clicks) and delirium (e.g., brief confusion assessment method) can be completed and documented in the EMR by physical therapy and nursing, respectively. In addition, disciplines such as social work can contribute to the documentation advance directives in the EMR. Nutrition assessments can be systematically recorded during consultations with dietitians, especially for patients identified with or at risk of malnutrition. Enhancing EMR capabilities to capture these metrics systematically, and leveraging interprofessional teams can avoid the additional cost of developing new databases. Similarly, secondary fracture prevention can be managed by enrolling patients in fracture liaison services, which can be documented and monitored through the EMR.

Given that these metrics directly contribute to improving the quality of geriatric care and can potentially reduce overall health care costs by preventing complications and subsequent fractures, Medicare and Medicaid could consider funding these initiatives. They could offer incentives or provide additional funding to health care providers who implement these metrics effectively. Future directions should include exploring opportunities for health care innovation and technological advancements.

Conclusion

In the realm of geriatric fracture care, the metrics currently employed often revolve around adherence to established guidelines and are heavily influenced by financial considerations. However, this narrow focus often overlooks the comprehensive needs and well-being of older patients. It is crucial to shift the paradigm towards metrics that truly matter for geriatric fracture patients, recognizing the multifaceted nature of their care and the profound impact these fractures have on their lives.

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Ethical Approval

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Informed Consent

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