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Adapting to Capacity Pressures: A New Era for Patient Flow and Transfer Models

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ABSTRACT

Patient transfers between acute care hospitals (inter-hospital transfer, IHT) occurs commonly, most often to provide specialized care unavailable at the index hospital. However, modern capacity constraints within the healthcare system have resulted in novel models of care that impact IHT. In this manuscript, we explore several models of patient transfer management that have evolved in response to current capacity constraints including repatriation and lateral patient transfers as newer care models to improve load-balancing across a healthcare system, and novel care models such as tele-consult services as alternatives to transfer.

Introduction

Patient transfers between acute care hospitals, also known as inter-hospital transfer (IHT) is common among patients hospitalized in U.S. hospitals. Frequency of IHT varies between specific patient populations, with approximately 1.5% of all hospitalized Medicare patients undergoing IHT,[1] but up to 50% of hospitalized patients with acute myocardial infarction[2-4] and a significant number of patients admitted to the intensive care unit.[5,6] Although patients are most often transferred to receive specialized care that is unavailable at the transferring hospital,[1,7] other reasons for transfer are also common, including patient continuity of care with their "home" institution or provider, and/or patient request, among others.[7]

Historically, various factors have influenced the management of IHT. In the 1980's, transfers of under-insured patients were common, leading to the passage of the EMTALA laws in 1986 to prevent the selective transfer of un- or under-insured patients as a hospital cost-saving measure.[8] In the early 2000's, hospitals were encouraged to "accept all" patients in order to expand their referral networks, a mindset that often still influences practice today.[9,10]

In recent years, the changing landscape of the U.S. healthcare system has significantly influenced IHT and overall patient flow. Healthcare systems have become increasingly consolidated, where currently 76% of acute care hospitals are now integrated into one of 635 healthcare systems nationwide; similarly, over 50% of physicians across the country are now employed by one of these healthcare systems.[11] Many consolidated healthcare systems aim to implement a "hub-and-spoke" model of care delivery, concentrating specialty services and leveraging economies of scale to enhance revenue generation.[12] However, these hospital mergers have increasingly resulted in the closure of small rural hospitals, leading to a reduction of acute care access for rural populations.[13] These recent shifts in the U.S. healthcare system have introduced new capacity pressures on acute care hospitals. The closure of rural hospitals now requires patients to be transferred for acute care that is no longer available locally. At the same time, specialty consolidation within hub-and-spoke models has increased the need to transfer patients to facilities equipped for specialized services. These evolving demands, in addition to ongoing capacity constraints resulting from the COVID-19 pandemic,[14] have driven a demand for patient transfers resulting in the need for innovative strategies to manage capacity and optimize patient flow across the system. In this perspectives article, we will discuss several burgeoning care models that have emerged to address patient transfer needs under current constraints of hospital capacity.

Repatriation

One emerging care model that has evolved in response to capacity management challenges is repatriation, i.e., the transfer of patients back to their originating hospitals once the quaternary phase of care has been completed. For example, a patient who initially presents to a community hospital may require specialized care unavailable within the community hospital. That patient will then undergo transfer to a tertiary care hospital, receive the specialized care that they need, and then undergo transfer back to their index hospital upon completion of their tertiary care needs. Originating within neonatal critical care networks in the 1970's,[15-17] the intended goal for repatriation is to optimize efficiency by freeing up high-acuity beds for new complex cases, improving patient throughput across the network. This burgeoning care model carries several advantages to traditional one-way transfers, both from a healthcare system and from a patient perspective. Healthcare systems can use this model to improve their capacity management to care for more complex patients with tertiary care needs within their tertiary care hospitals, i.e., "right-fitting" patients to the hospitals best able to care for them. From the patient's perspective, repatriation can enhance the care experience by allowing recovery and ongoing treatment to occur closer to home, often with greater access to family support and local care teams. Recent studies on modern repatriation

models for hospitalized medical patients have shown promising outcomes, demonstrating both the feasibility of repatriating meaningful patient volumes and the potential for substantial bed-day savings.[18] Crucial to the success of repatriation models is the engagement of key stakeholders to ensure clinician buy-in, as this approach represents a cultural shift for frontline providers more accustomed to receiving than transferring patients. Embedded in successful repatriation models are dedicated personnel that assume the responsibility for assessing clinical readiness for repatriation and coordinating communication among care teams, patients, and families.[19] As expected, repatriation tends to be more successful between closely affiliated hospitals, likely due to established relationships that facilitate smoother and more coordinated transitions of care.

While repatriation presents a promising approach to care coordination and capacity management with IHT, several challenges remain. First, capacity constraints affect not only tertiary and quaternary hospitals but also the community hospitals intended to receive repatriated patients. Thus, the index facility may lack the space to accept patients back following completion of their tertiary care needs. Additionally, many patients do not require ongoing hospitalization following completion of their tertiary care needs; thus, repatriation may paradoxically increase patient length of stay, prolonging their hospitalization within an acute care setting rather than working towards discharge planning, i.e., to a sub-acute care facility. Second, repatriation inherently introduces greater discontinuity of care, as patients experience a "double transfer" to and from the higher-level care center. To mitigate communication gaps and ensure safe transitions, it will be essential to establish standardized processes for information sharing and clinical handoffs as this care model continues to evolve. Lastly, repatriation requires unique resources within the healthcare system, including dedicated personnel to address timing and communication during transfer into and out of the tertiary care hospital and coordination of medical record/clinical data transfer, among other needs. To address this added complexity, many healthcare systems are adopting capacity command centers to address these more multifaceted patient flow needs. Unlike traditional transfer centers, which primarily coordinate patient movement into or out of a single hospital, capacity command centers take a broader, system-level approach, to support a range of operational and clinical functions. This centralized model is often required to leverage key teams and real-time data and analytics to effectively operationalize repatriation.[20-22]

Lateral Patient Transfers

Lateral patient transfers, or "load balancing," is another expanding care model in response to growing capacity constraints. In contrast to repatriation where patients are transferred to higher level acute care facilities, then back to their hospital of origin, lateral transfers involve directing patients, either at the point of transfer request or upon admission through the emergency department, to any hospital within the health system that has the appropriate capacity and clinical capabilities to effectively care for that patient. The growing consolidation of hospitals and the emergence of capacity command centers have streamlined this process by enabling real-time coordination across facilities. For example, if a quaternary care hospital lacks available beds, but an affiliated community hospital can adequately manage the patient's needs, the system can redirect the transfer accordingly. Similarly, emergency department patients requiring admission may be transferred laterally to a less burdened hospital within the network to optimize patient flow. This approach not only improves system efficiency by optimizing bed utilization and reducing overcrowding, but also enhances patient outcomes by enabling more timely access to appropriate care.[23,24]

Notably, evidence-based guidelines for managing lateral patient transfers remain limited, as this capacity management model continues to evolve. Hospitals often rely on operational 'triggers' including

emergency department boarding times, bed availability at receiving sites, ambulance delays, and ICU capacity to initiate or suspend load-balancing efforts. As this care model continues to develop, rigorous evaluation will be essential to define best practices, ensure appropriate patient selection, and inform the development of standardized protocols. Targeted research and policy efforts will be critical to support safe, efficient, and scalable implementation across diverse healthcare settings.

Novel Care Models: Alternatives to Transfer

Lastly, an emerging but less-developed strategy for managing patient transfers in capacity-constrained systems is the exploration of alternatives to transfer.[25] In light of increasing capacity pressures, health systems have an opportunity to reimagine care delivery beyond the traditional hospital environment. Additionally, capacity command centers, with their system-wide coordination capabilities, are well-positioned to lead the design and implementation of processes that support these alternative care pathways. Recent advancements in health information technology - particularly telehealth, which expanded rapidly during the COVID-19 pandemic[26] - have created new opportunities to develop virtual consult models as alternatives to physical patient transfers. This approach may be ideal for patients needing specialized cognitive expertise rather than procedural interventions, or when input from a familiar provider can help advance the care plan. For example, one could imagine a scenario where a hospitalized patient with a specialized cardiac condition receives care guidance via tele-consult with their known cardiac specialist without requiring physical transfer of that patient to the tertiary care hospital; or alternatively, if their care need is less urgent, undergoes expedited follow up with the cardiac specialist following discharge. Either of these alternatives to transfer would then protect the tertiary care bed for a patient with more complex care needs, avoid patient transfer to a hospital that may be further away from supportive family, and save the healthcare system the additional resources required to complete a full patient transfer.

Although promising in theory, our current healthcare system poses barriers that will need to be addressed to effectively develop and implement alternatives to transfer. For example, for tele-consult to evolve as an actual alternative to transfer, it will be crucial to implement supportive infrastructure changes such as revising reimbursement structures, physician time allocation, and access to real-time patient data to realistically provide high quality tele-consult care. Similarly, expedited outpatient follow-up as an alternative to transfer will require improved access and availability to outpatient specialty services, currently lacking in many healthcare settings. Equally important will be to engage both patients and clinicians to ensure appropriate patient selection for transfer alternatives.

Conclusions

In summary, recent shifts in the U.S. healthcare landscape including hospital consolidations and rural hospital closures have introduced new capacity challenges for acute care hospitals. These pressures call for innovative approaches to managing patient transfers and hospital flow, including repatriation, lateral transfers and exploration of development of alternatives to traditional transfer. These innovative care models are likely to expand and evolve given existing pressures within the healthcare system; thus, ongoing research should aim to identify best practices and metrics for success.

Conflicts of Interest:

No conflicts of interest to disclose.

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