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Review Article

Health Management and Policy Section

Improving Discharge Efficiency through Standard Operating Procedures, Mapping and Standardisation: A Narrative Review

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ABSTRACT

Efficient hospital discharge processes are essential for optimising healthcare delivery, reducing operational costs, and improving patient outcomes. Inefficiencies such as poorly defined workflows and inconsistent adherence to Standard Operating Procedures (SOPs) contribute significantly to delays and compromised care quality. This narrative review explores and compares the efficacy of the Process Mapping Plan of Action (PMPOA) and Standardised High Line Processes (SHLP) in minimising Turnaround Time (TAT) and enhancing discharge efficiency in medical and surgical wards. A comprehensive literature search was conducted across PubMed, Scopus, and Google Scholar, selecting studies that evaluated process mapping or SOP implementation in the context of hospital discharge with measurable outcomes, including TAT and workflow optimisation. Twenty studies were analysed, revealing key contributors to discharge delays, including late ward rounds, delayed discharge orders, and communication gaps. Findings suggest that both PMPOA and SHLP strategies are effective in improving workflow, reducing TAT, and enhancing overall patient care. Incorporating structured protocols, technological tools, and continuous monitoring mechanisms can lead to sustainable improvements in the discharge process.

Keywords: Process mapping, Turnaround time, Workflow efficiency

INTRODUCTION

Efficient discharge processes are significant for improving the healthcare delivery systems. This is achieved by optimising the use of hospital resources and improving financial performance. Delayed discharges can lead to increased operational costs, reduced turnover, and decreased patient satisfaction. The impact of structured discharge strategies is to improve patient outcomes and hospital efficiency. Efficient patient discharges are associated with improvements in patient outcomes, such as reduced medication-related complications and enhanced recovery trajectories [1]. The re-engineered discharge program has shown reduced rehospitalisation rates of over 20%, as this program emphasises communication [2]. Proactive discharge strategies are important for increasing hospital throughput. A large-scale initiative at a 650-bed academic centre increased the discharge rates before noon from 9.5% to 26.8%, thus bed availability can be improved without compromising care quality [3]. Also, early discharge planning and other interventions are associated with cost savings and shorter lengths of stay [4]. Standardised discharge tools such as checklists have helped streamline workflows during the discharge process. This has reduced average discharge times by more than an hour and improved intra-team communication [5].

Optimisation of discharge processes in medical and surgical wards is important for improving hospital efficiency and patient care. Germany has mandated discharge management, and the cost was 43 per patient, but this has not shown any decrease in the length of stay [6]. Introducing a multidisciplinary discharge coordination team effectively decreased average stay durations from 15.45 to 9.04 days without raising readmission rates [7]. Leveraging machine learning, predictive analytics achieved an 87.5% accuracy in forecasting emergency patient discharges [8]. Combining the predictive tools in multidisciplinary rounds can help reduce the duration of hospital stays to well over twelve hours [9]. Universal implementation and addressing patient-specific barriers remain challenging. These approaches require tailored, data-driven interventions to optimise discharge practices and improve healthcare outcomes.

Hospital discharge processes are often affected by inefficiencies such as poorly defined workflows and inconsistent adherence to SOPs. Even when SOPs are used, challenges such as variable implementation and communication gaps persist. Addressing these issues with innovative strategies can improve discharge process efficiency. SOPs are designed to promote uniformity in discharge practice; however, their application is inconsistent across healthcare settings. Effective SOPs can reduce lead times by more than 25 per cent, achieved by optimising staff training to remove redundant tasks [10]. However, to realise these outcomes there is a need for robust adherence mechanisms. Models like re-engineered discharge frameworks have shown significant improvements in patient satisfaction and reduced rehospitalisation rates by twenty per cent, mainly through improved communication and patient education [2]. Additionally, Lean Six Sigma methods can help identify and reduce waste and improve operational efficiency and quality of care [11]. SOPs are also limited by complex workflows and insufficient training for staff [12]. Communication gaps between departments can also cause delays; this highlights the need for integrated systems that facilitate timely information exchange.

Process optimisation in healthcare uses strategies such as PMPOA and SHLP to streamline workflows and improve outcomes. Process mapping enables workflow visualisation, identifying bottlenecks and guiding interventions. This approach is practical in emergency medicine or surgical workflows, where inefficiencies often arise from variability [13]. Addressing localised challenges in process mapping can foster improvements in care delivery [14]. Similarly, standardised high line processes prioritise consistency and efficiency by implementing predefined SOPs. These frameworks reduce variability and help ensure care delivery in diverse healthcare environments, improving logistics efficiency and quality management. However, the rigidity of standardised processes may impede innovation and

adaptability, particularly in dynamic healthcare settings. Critics argue that overemphasising uniformity could limit the capacity to respond to unique or emergent situations. Thus, achieving a balance between process standardisation and contextual flexibility is essential to foster sustainable improvements in healthcare systems. Future research should explore hybrid models that integrate these strategies, ensuring adaptability without compromising efficiency. By blending innovation with standardisation, healthcare organisations can better navigate the complexities of modern clinical operations, enhancing patient care and system performance.

This review aims to explore the comparative efficacy of two process-optimisation strategies, the PMPOA and SHLP, in improving SOPs. These approaches are examined in the context of reducing TAT and addressing delays in the hospital discharge process. The review seeks to provide actionable insights for healthcare administrators seeking to enhance operational efficiency and patient care outcomes by analysing their respective advantages, limitations, and practical applications.

MATERIALS AND METHODS

The review was conducted in three phases: literature identification, critical appraisal, and thematic synthesis. Literature identification involved comprehensive database searches and handpicking key articles from reference lists. Critical appraisal was conducted to ensure methodological rigour, with selected studies reviewed for validity, reliability, and relevance. Thematic synthesis focused on categorising findings into process-mapping outcomes, SOP efficacy, and strategies for delay reduction.

A literature search was conducted in PubMed, Scopus, and Google Scholar for studies published between 2020 and 2024, focusing on healthcare management, hospital operations, and process optimisation. Priority was given to peer-reviewed journals such as BMJ Quality and Safety, Journal of Hospital Administration, and Healthcare Management Review. Included studies examined process mapping or SOPs in hospital discharge processes, with measurable outcomes such as TAT, workflow efficiency, or discharge delays. Excluded were studies lacking empirical data, methodological rigour, or relevance to hospital operations. Two reviewers independently extracted data using a structured Excel template, capturing key study characteristics, metrics, and findings. Discrepancies were resolved through consensus.

RESULTS

A total of 24 articles were included in this narrative review, providing insights into the comparative efficacy of PMPOA and SHLP in optimising hospital discharge workflows in medical and surgical wards. The results of the included studies were categorised into key themes addressing process-mapping outcomes, standardised SOP findings, challenges/barriers, and overall discharge optimisation strategies. The selected studies encompassed a diverse range of methodologies, including observational studies, case studies, and experimental designs. These studies were conducted across North America, Europe, Asia, and the Middle East, with the majority published in high-impact healthcare-management journals. Turnaround Time (TAT) in hospital discharge processes is a significant measure of operational efficiency and patient flow. It comprises the interval from the discharge decision to the patient physically leaving the hospital [15]. Prolonged TAT can cause bed shortages, increased patient wait times, and inefficiencies in operational methods, particularly in medical and surgical wards. Understanding the factors that influence TAT is important for developing effective improvement strategies [16]. TAT differs between medical and surgical wards, with operational and clinical workflows contributing to these differences [17]. Ward rounds in medical wards often involve lengthy discussions and complex evaluations, increasing review times; in surgical wards, delays arise from postoperative analyses and coordination challenges between surgical and ancillary staff [18]. In both settings, inefficiencies in documentation, communication, and pending assessments lead to longer TAT. [Table/Fig-1] presents the characteristics of findings in the included studies [19-38].

Authors/Year	Journal	Country/ Region	Study design	Study metrics	Process mapping findings	Standardised SOP findings	Challenges/Barriers
Lummus RR et al., 2006 [19]	Total Quality Management	USA	VSM in physician clinic	Visit cycle time	Mapped clinic workflows; reduced waiting times	SOPs for referral and check in processes	Data collection, variability across physicians
Cima RR et al., 2011 [20]	J Am Coll Surg	USA	Lean Six Sigma in OR	OR turnover efficiency, on-time starts	Mapped OR processes; increased turnover and on-time starts	SOPs for room turnover	Staff coordination, training demands
Mangum CD et al., 2021 [21]	Pediatr Qual Saf	USA	Use of lean healthcare to improve	Patient throughput, cycle time	Mapped test flow; improved throughput	SOPs for patient prep and testing workflows	Equipment downtime, workflow variability
Nordmark S et al., 2016 [22]	BMC Med Inform Decis Mak	Sweden	Implementation evaluation	Discharge planning integration	Used process mapping to define transition points	Analysed via Normalisation Process Theory	Lack of SOP ownership, delay in system adoption
Gellad ZF and Day TE 2016 [23]	Am J Gastroenterol	USA	Commentary+ case example	Operational indicators	Identified non value activities using mapping	SOPs for scheduling and patient prep	Adoption in non-manufacturing settings
Jack B et al. 2023 [24]	J Healthc Manag Stand	Pakistan	Re-engineering the hospital discharge	Discharge before 2 pm metric	Mapped discharge flow, reducing time by 2.16 hours	Embedded in restructured discharge workflow	Interdepartmental coordination, communication inefficiencies
Haron S et al., 2015 [25]	J Manag Res	Brazil	Patient process flow improvement	Process time, waste identification	Mapped material and info flows	SOPs structured around waste mitigation	Cultural inertia, complex workflows
AlGhaithi M, et al., 2025 [26]	Open Public Health J	USA	Optimizing early discharge planning	Nurse discharge coordination and timing	Lean methodology clarified discharge roles and steps	SOP implications not explicitly tested	Role ambiguity, inconsistent documentation
Cheung Y, et al., 2016 [27]	Radiographics	USA	No more waits and delays	Cycle time, utilisation	Mapped imaging workflow; reduced cycle time	SOPs for image prep and scheduling	Technical complexity, user buy in
Chan H, et al., 2014 [28]	World J Emerg Med	Italy	Lean techniques for the	LOS, patient satisfaction, wait times	Mapped ED patient flow; Gemba walks and kaizen events	SOPs for triage, labs, nurse-handover	Leadership buy-in, training needs
Cabrera J et al., 2020 [29]	S Afr J Ind Eng	Spain	Improving quality by implementing	Flow efficiency, service quality, Lean tools	Used PDCA and 5S to streamline process	SOPs structured around mapped processes	Resistance to change, lack of lean expertise

Khankeh HR 2020 [30]	Iran J Nurs Midwifery Res	Brazil	Triage effect on wait time	Waiting time, throughput	VSM showed info/service delays	SOPs guided triage and routing	Process compliance, culture resistance
Marin Garcia JA et al., 2021 [31]	IJERPH	Spain	Scoping Review	80 articles, VSM in healthcare	Identified heterogeneity in mapping tools and flows	Need for standardisation across VSM practices	Lack of environmental indicators, process inconsistency
Fiorillo A et al., 2021 [32]	Total Qual Manage Bus Excell	Italy	Lean in surgical oncology	LOS (days)	Mapped inpatient pathway; identified waste and delays	SOP driven Lean solutions reduced LOS	Resistance to staff change, adaptation period
Vasconcelos AF and Rocha LP, 2021 [33]	Int J Lean Six Sigma	Brazil	Lean in occupational health	Clinic throughput, process time	Mapped bottlenecks	SOPs standardised worker assessment workflows	Staff training and system integration
Ramos G, et al., 2022 [34]	Rev Prod Online	Tunisia	Value stream mapping in healthcare	Length of stay, added value %	Mapped flows; low added-value rate; record delays	SOPs for signage, scheduling, records	Inadequate signage, inefficient scheduling
Wojtys EM et al., 2009 [35]	J Healthc Qual	Spain	Applying lean techniques to improve	Appointment scheduling time	Mapped scheduling process, identified bottlenecks	SOPs for booking and confirmation	Resistance to change, IT integration
Kuncorosidi A and Lestari F 2022 [36]	J Risk Bus Manage Tirtayasa	Indonesia	VSM simulation in outpatient	PEC (<30%), waiting time	Identified waste, PEC under 30%	Simulated SOP workflows for future state	Data accuracy, staff training
Hendricks RM et al., 2019 [37]	Online J Public Health Inform	Netherlands	Process mining of incoming patients	Model fitness, generalisation	Mapped sepsis flow; high model fitness (97.8%)	SOPs aligned with clinical guidelines	Complexity of event logs, SOP–guideline alignment
Muna L and Hartanti L 2023 [38]	J Manag Kesehatan Indo	Indonesia	VSM in outpatient dept	Waiting time (mins)	Current lead time 99.2 min; two waste types identified	Future map proposed reduced to 58.2 min	Lack of electronic eligibility certification

[Table/Fig-1]: Summary of included studies [19-38].

DISCUSSION

Factors Influencing TAT

Ward rounds are the main component of hospital workflows. However, they are often interrupted, leading to delays in patient review and decision-making. Observational studies report that the average time spent per patient during ward rounds ranges from ten to twenty-two minutes, depending on the complexity of the patient [37]. Interruptions such as unscheduled discussions or staff unavailability can further impact these delays. One important factor contributing to prolonged TAT is the delay in completing discharge and medication orders. On average, these tasks take between 2.5 and 3.5 hours, indicating the burden of administration work on healthcare providers [37,38]. Automated systems for discharge documentation have shown promise in reducing these times but remain underutilised in many healthcare settings. Incomplete medical evaluations or test results on the day of discharge can also cause delays. Discharge processes are often delayed due to incomplete imaging, laboratory reports, or specialist consultations, all of which are important for a safe patient transition [39].

Predictive Modelling and Interventions

The use of machine learning in discharge workflows improves the ability to predict readiness for discharge. Advanced models can achieve up to 77 per cent accuracy in predicting TAT by analysing clinical and non clinical variables such as patient acuity, staffing levels, and documentation timelines [40]. These predictive tools help hospitals allocate resources more efficiently and anticipate potential bottlenecks. Structured discharge protocols, such as re-engineered discharge programs, have shown improvements in discharge efficiency and patient outcomes. These approaches can help reduce rehospitalisation rates and improve patient satisfaction by standardising the discharge process. Additionally, including patient education and facilitating follow-up care can help improve the situation [41]. While these approaches can help optimise TAT and improve efficiency, they must balance individual patient care. Changes in patient needs, particularly for those with complex medical or social conditions, pose challenges to standardising the discharge processes. A balance between operational efficiency and high-quality care is vital for improvements in hospital discharge processes [42].

Common Bottlenecks in Discharge Processes

Billing delays are another cause of prolonged TAT in hospital discharge processes. Finalising hospital bills typically involves clearances from multiple departments such as pharmacy, laboratory, and radiology. This combined with other factors may lead to discharge delays of one to two hours [43]. More efficient communication and coordination among healthcare providers can lead to a cohesive discharge process. Poor collaboration between physicians, nurses, and administrative staff can result in overlooked discharge planning, insufficient follow-up care, and delays in transitioning patients to post-hospitalisation care. Lack of coordination is also associated with higher readmission rates and reduced patient satisfaction [44].

SOPs and Discharge Planning Protocols

Effective discharge processes hinge on the implementation of SOPs and evidence-based protocols. These frameworks are designed to prioritise patient-centred care while addressing organisational challenges in healthcare delivery. SOPs ensure a systematic approach to discharge planning, reducing variability and helping to ensure the consistency of care provided. An interdisciplinary approach is significant in discharge planning. Collaborative teams with physicians, nurses, social workers, and case managers work together to develop individualised discharge plans. Such coordination reduces TAT and also improves postdischarge outcomes by addressing the clinical, social, and emotional needs of patients [45].

Process Mapping in Discharge Planning

Process mapping is a critical tool for visualising workflows, identifying inefficiencies, and optimising care coordination in discharge planning. By outlining each step in the process, it enables healthcare providers to understand roles and the sequence of tasks involved. This approach is efficient in identifying communication gaps and workflow bottlenecks and provides details regarding standardisation [46]. Successful discharge planning depends on collaboration among surgeons, nurses, case managers, and therapists. Despite challenges such as time constraints and resistance to change, the strengths of process mapping improve communication and enable targeted interventions. This makes process mapping indispensable for discharge planning. Future efforts should focus on integrating innovative tools and addressing social determinants to ensure equitable and effective care transitions.

Effective Strategies for Discharge Planning

Poor coordination among providers is a significant barrier that leads to delays and complications. Discharge templates and structured processes standardise documentation and improve workflow efficiency [47]. Interdisciplinary approaches are team-based interventions that ensure comprehensive care delivery [48].

Standardised High Line Process for SOP Identification

A standardised high line process for SOP identification is necessary for obtaining consistency, efficiency, and quality in different settings. This process involves systematic steps used to address specific operational needs, ensuring that SOPs are both comprehensive and actionable. The process starts with a thorough assessment to identify gaps in current practices. This step involves determining the necessity of new SOPs based on operational requirements, resource availability, and performance objectives [48].

The standardised high line process for SOP identification ensures operational excellence by combining structured development, practical training, and continuous monitoring. Although challenges exist, leveraging evidence-based strategies and fostering stakeholder collaboration can drive successful implementation and long term improvements in SOP adherence and organisational outcomes. High line SOPs have demonstrated measurable impacts on reducing discharge times.

CONCLUSION(S)

Optimising TAT in hospital discharge processes is crucial for enhancing healthcare efficiency, affecting patient flow, resource allocation, and patient satisfaction. Delays often stem from issues in ward rounds, incomplete discharge orders, and poor inter-departmental communication. Surgical and medical wards face specific challenges, including complex patient evaluations. Addressing these requires a balanced approach that combines operational efficiency with personalised care. Innovations such as automated documentation systems and predictive models can streamline workflows. Implementing structured discharge protocols that emphasise patient education and inter-professional collaboration is essential for improving outcomes. By integrating process mapping, healthcare teams can identify bottlenecks and enhance communication, ultimately promoting better health outcomes in discharge processes.

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PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Jul 04, 2025
- Manual Googling: Jul 19, 2025
- iThenticate Software: Jul 22, 2025 (4%)

ETYMOLOGY: Author Origin

EMENDATIONS: 5

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was informed consent obtained from the subjects involved in the study? NA
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