RESEARCH ARTICLES

A mixed methods study exploring delays amongst patients ready to be discharged home in an acute surgical unit in New Zealand

AUTHORS

JOLENE E.JONES BNurs(Hons), NZRN[1,2]

MATTHEW JG PARSONS PHD, MSc BSc (Hons), RGN, NZRN[1,2]

JEWEL BARLOW-ARMSTRONG Med, BNurs[2]

1 Te Whatu Ora – Waikato District, Waikato, New Zealand

2 Faculty of Health, The University of Waikato, Hamilton, New Zealand

CORRESPONDING AUTHOR

JE JONES 25b Kiwi Avenue, New Zealand. Ph: 02041038103, E: jovoogt123@gmail.com

ABSTRACT

Objective: This study aims to explore the reasons for hospital discharge-delay in an acute surgical unit (ASU) and the ways in which discharge-delays can be minimised.

Background: Discharge-delay, the period of continued hospital stay after a patient is deemed medically fit to leave hospital, is one of the most significant barriers to optimal patient flow within the hospital system. Discharge-delay retains non-acute patients in the acute environment unnecessarily, while preventing acutely presenting patients from accessing services in a timely manner. It results in overcrowded emergency departments (ED) with delayed admissions, slowed theatre schedules, and bed blocking in critical care, as well as negatively impacting patient experience.

Methods: A two phased, mixed methods design was employed in this research. Phase one obtained qualitative data through semi-structured interviews with nine staff members occupying different roles within the health care team. Themes derived from phase one informed the development of an audit and survey form utilised in phase two, which involved collecting quantitative data through its completion by registered nurses working in the ASU during the study period. This audit recorded the time a patient was cleared for discharge, and the time they left the ward, from which the amount of discharge-delay could be calculated. The survey recorded delaying factors that occurred for each patient discharged from the ward during the audit period.

Results: Thematic analysis of the interview transcriptions revealed three core themes:
(i) It takes a village to discharge a patient;
(ii) Preparation, clearance, home; and
(iii) Challenges and solutions to discharge-delay.

The survey was completed by Registered Nurses regarding 40 discharging patients who they provided care for. Analysis revealed a mean patient discharge-delay of 225 minutes across the 40 patients. The most frequently recorded delay factors were 'waiting for paperwork' (55%) and 'waiting for transport' (40%).

Conclusions: This study found that to reduce discharge-delay system-wide optimisation across the entire patient journey, with particular focus on reducing paperwork related delay, is required. Introducing a 'discharge-focused clinician' and improving the utilisation of transit lounge will especially help to reduce discharge-delay.

 https://doi.org/10.37464/2025.422.1291

RESEARCH ARTICLES

What is already known about the topic?
- Unnecessarily long hospital admissions negatively impact patient experience and outcomes.
- Slow acute discharges effects patient flow organisation wide, including EDs, critical care, and theatre.

What this paper adds?
- This paper focuses on the time between a patient being medically cleared and physically leaving the acute ward environment, allowing the specific period of discharge-delay to be quantified, understood and addressed.
- It clearly identifies specific discharge-delay causing factors in the context of an ASU and proposes solutions to optimise the discharge process.

Keywords: Access-block, acute-surgical-unit, delay, discharge, length-of-stay, optimisation, patient-flow

INTRODUCTION

Ensuring that patients have access to services in a timely manner is fundamental to providing quality care, therefore, moving patients along their in-patient journey from admission to discharge efficiently is essential. The most frequently cited cause of patient flow issues relates to discharge-delay.[1,2] In the context of a hospital, discharge refers to the completion of inpatient hospital care, with the patient either returning home with no further care required, or with care continuing in some capacity but within a non-hospital environment.[3] The discharge process involves the health care team determining whether the patient is ready to leave the hospital environment, and formally discharging the patient from their care.[4] Patient education, follow up care planning, and the delivery of a prescription and discharge summary may all be included in this process.[5]

Discharge-delay occurs when patients remain in the acute care setting beyond the time in which they are medically fit to leave this environment.[6] This phenomenon retains patients in hospital unnecessarily, while preventing other patients from accessing acute services – a process known as access block. Previous literature has identified inadequate health team resourcing and lack of collaboration,[2] rehabilitation and nursing home bed shortages,[7] and poor discharge planning as causes of discharge delay.[8] Minimising discharge-delay is key to improving patient flow and service access. This research aims to identify the causes of discharge-delay in a large New Zealand tertiary hospital, explore the impact of discharge-delay, and discuss the ways in which discharge-delay can be reduced.

Hospitals are complex organisations with many services and processes that must integrate together cohesively to ensure patients receive timely and appropriate care. To achieve this, supply and demand for services must remain in equilibrium. The balance of supply and demand is essentially an issue of bed space availability; for every patient presenting to hospital, either acutely or electively, there must be a patient leaving. Therefore, focusing on this 'leaving' portion of the patient journey is fundamental to improving patient flow and overall hospital function. The effects of discharge-delay are far reaching. When bed spaces in wards cannot be made available, patients who present to the hospital acutely via the emergency department (ED) cannot be admitted and instead must remain in the ED. This results in overcrowding, stretched resources, and increased wait times within the department.[9] Elective treatment is also impacted, as it cannot take place without a bed to admit a patient to post-operatively.[10,11] Thus, discharge-delay increases the hospital above ideal operational capacity resulting in stretched resources, long wait times, and care rationing.[10,11]

Patients who experience discharge-delay may experience its negative effect directly through increased exposure to potential hospital acquired complications,[12] increased risk of deconditioning,[13] and decreased wellbeing due to feelings of isolation, anxiety and disempowerment.[6,14]

Other patients receiving care in a system with prevalent discharge-delay are affected indirectly. Overcrowding, care rationing, and delays in access to care such as medical imaging and surgery are all increased in a system where discharge-delay occurs and are linked to negative patient outcomes.[9–11]

Furthermore, delayed discharges have been associated with higher hospital costs due to increased length of stay, delayed transfers between departments, and the cancellation of elective surgery.[10,11,15–17] Reduction of surgical throughput, because of elective surgery cancellation due to unavailability of beds, may result in reduction of revenue in health systems where revenue is associated with surgical volume.[18–20]

Previous research has focused on factors that increase patients' overall length of stay such as delays to medical imaging or surgery, or on intrinsic patient factors such as older age and co-morbidity. Although this literature highlights important features of discharge-delay and proposes some solutions,[21–25] an evident research gap remains. Health workers anecdotally report that most patients remain in the acute environment for several hours after they are deemed dischargeable and are no longer requiring acute care. However, little research has focused on the time between when a patient is medically cleared for discharge and the time that they leave the acute environment. To address this research gap, this study defined

 https://doi.org/10.37464/2025.422.1291

discharge-delay as the amount of time between when the patient is medically cleared for discharge and when they leave the acute ward environment and sought to explore this phenomenon and its cause.

METHODS

STUDY DESIGN

This research was carried out as a two-phase mixed-methods study. A dialectical mixed-methods methodological approach was employed allowing for quantitative trends to be identified while exploring the multifaceted and interconnected qualitative concepts influencing these trends. Mixed methods research aims to demonstrate that a relationship or phenomena exists, and why and how it exists within its context. It draws strengths from both qualitative and quantitative research paradigms and is therefore an appropriate choice for health care research such as this where many interwoven concepts underpin an observable phenomena or trend.[26,27]

The first phase involved interviews with a range of staff, exploring the discharge process, perceived causes of discharge-delay, and the way in which different roles engage with patient discharge. The qualitative data from phase one informed the development of the second phase, which utilised a survey and time audit to quantify the cause and extent of discharge delay on the studied ward (Figure 1). The study was undertaken in 2022 and received ethics clearance in 2021 (Approval number: Ref: 2021#31).

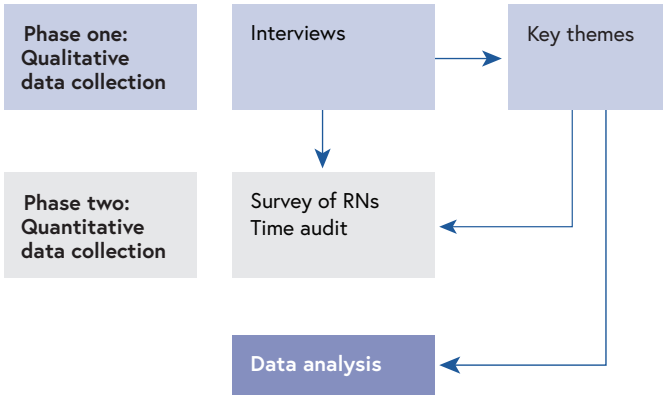

FIGURE 1. STUDY DESIGN

STUDY SETTING AND RECRUITMENT

The research was undertaken in one acute surgical unit in a large 600+ bedded tertiary hospital in the central health region in the North Island with a population of over 420,000 people.

DATA COLLECTION AND ANALYSIS

Phase one involved gathering qualitative data through a series of semi-structured interviews with relevant staff involved in the discharge process. The purpose of the interviews was to ascertain the opinions of staff on the discharge process, causes of discharge-delay, and on what they believe could be improved on, as well as garnering understanding of the discharge process broadly and the way different professional roles engage with patient discharge. These data were then analysed systematically using general inductive inquiry. After the interviews were transcribed, they were read thoroughly, with a code attributed to each idea or concept articulated by the participants. Once a series of codes was established across the interview's transcriptions, these codes were condensed into categories, which were in turn grouped into themes. This process allowed for the many different ideas that emerged from the interviews to be translated into broader themes to answer the research questions from a qualitative lens, as well as providing the context for the development of the survey form used in phase two.

Phase two involved an audit and survey, completed for all patients discharged from the Acute Surgical Unit over a 14-day period. When a patient was declared 'ready for discharge' or for 'discharge planning' by the medical team, the time of the decision was recorded on the time audit form by the patients RN, signifying the time at which the patient was medically cleared for discharge. Once the patient left the care of the ward, this time was also recorded, signifying the time they stopped receiving acute care. The length of time between these two events was recorded as discharge-delay. These two moments were chosen because they best captured the phenomenon being studied and aligned with the study's stated definition of discharge-delay. The total and mean amount of discharge-delay observed during the study period could then be calculated.

After the patient left the ward, the registered nurse responsible for the patient completed the survey by recording the events that had taken place in the time between the patient being medically cleared for discharge and physically leaving the ward. This survey was a tick box form that contained 21 potential causes of delay, where any number of events could be selected that the RN believed had delayed their patient's discharge. These cause options were developed from the causes of delay identified in the qualitative interviews in phase one. The selected causes of discharge-delay were totalled and recorded in a frequency table. Percentages of their frequency of occurrence were also calculated so that the discharge delaying factors that occurred most frequently could be more fully understood.

RESULTS

QUALITATIVE FINDINGS

A total of nine interviews with members of the health care team were conducted. The sample selected included participants with a broad range of involvement in health care and in the discharge process. Their roles and relevant experience are outlined in Table 1.

TABLE 1. PHASE ONE SAMPLE

Participant	Role description
Charge nurse manager	Charge nurse of the sampled ward
Senior operational manager	Nurse manager for surgery in charge of 11 surgical wards, prehospital preparedness unit and the nurse specialists for surgery. Project managed the development of the sampled ward
Executive nursing manager	Senior manager whose portfolio covers professional development, education and training and workforce. Background as duty manager.
Associate charge nurse manager	ACNM in role for one year with extensive experience in surgical nursing
Senior registered nurse	Senior floor RN with extensive experience in the general surgical specialty
House officer	Second year house officer completing a rotation in the general surgical speciality. Previous experience working in other hospitals.
Junior registrar	Junior general surgical registrar
Surgical fellow	General surgical training fellow
Physiotherapist	Rotational physiotherapist working in general surgery at time of interview

The interviews were all semi-structured in nature, allowing a wide range of topics relevant to discharge-delay to be explored. The interviews were transcribed verbatim and analysed using a general inductive method of enquiry. A total of 961 codes were generated, which were collated into seven categories and then three themes as illustrated in Figure 2.

Theme 1: It takes a village to discharge a patient

Overall, participants agreed that senior medical officers (SMO) have overall responsibility for discharge decisions, registrars often make those decisions on behalf of the consultants or in collaboration with them, and house officers (junior doctors who have not begun speciality training) complete the tasks required to discharge the patient. Underlying this, nursing staff proactively progress discharge, and multidisciplinary team members (MDT) provide clearance on specific requirements such as mobility, or diet.

> "The house surgeons are really good. They don't have as much say I don't think, but they provide information that aids me to make that (discharge) decision. For the nursing staff (their input is) really important because they know a lot more about what's going on with the patient. Are they cleared from a MDT perspective? Because it's not just us that always make the decisions, it's a whole bunch of people from different areas as well." Junior Registrar

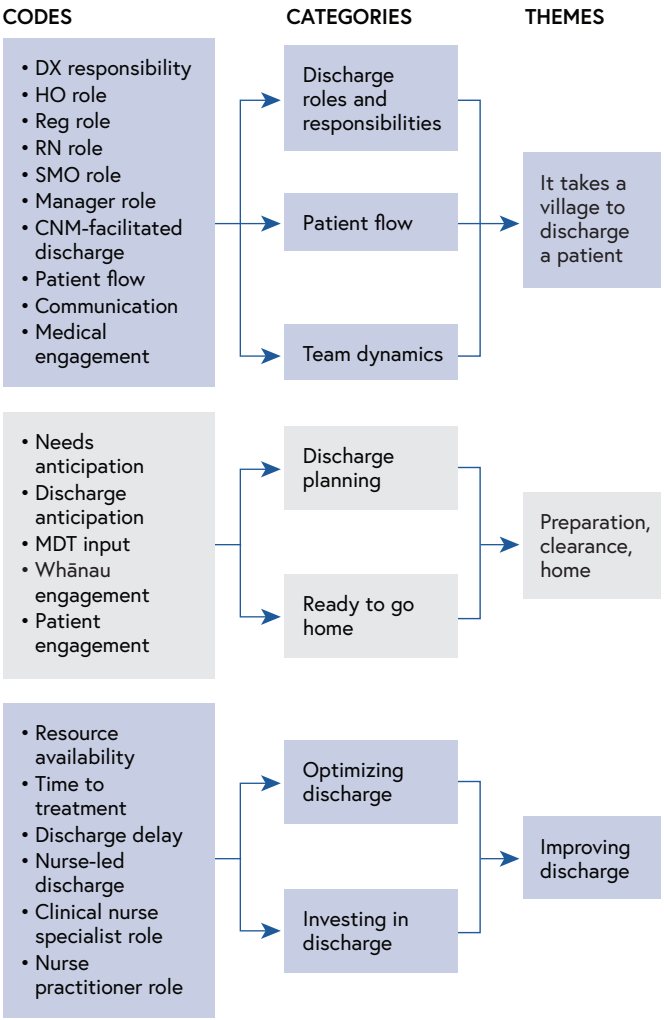

FIGURE 2. THEMATIC ANALYSIS

Inability to prioritise discharge was also discussed, with all participants agreeing that house officers are unable to prioritise and complete discharges due to their high workload.

> "Often, we need to get our CT scan requests, our cardiology consults or extra stuff done before lunchtime, or even before 1400 so that we actually get a plan before 1600 and so our discharges are our lowest priority…they are done after 1500… So because they are low priority, that's where the bottleneck lies. We can't do it the other way around. We can't discharge people early in the morning and then request our CT at 1500 because (the scan) won't be done (that day)." Surgical house officer

Communication was also discussed as it relates to efficient discharge. Participants cited faulty communication tools, and the inability to contact staff members quickly as barriers to efficient discharge.

 https://doi.org/10.37464/2025.422.1291

> "Often the registrars will just make the call on the ward round, but often, we've had a change or some blood results have come back, then we text or put it up on a group chat that "so and so is kind of ready for discharge. Are you guys happy?" and often the registrars are scrubbed into theatre so we don't get a reply until 15:30 or 1600, which means that the patients are kind of waiting around just to be discharged and even though the house officer is happy with the patient going home, ultimately, we usually can't make that decision until a registrar or consultant has signed them off." House officer

Theme 2: Preparation, clearance, home

The importance of commencing holistic discharge planning from admission, and revisiting discharge progression every day was emphasised by all participants. Participants also reflected that discharge planning needs to involve the patient and their family or support system to ensure that the patient feels well prepared, and that all their holistic discharge needs are understood by the health care team.

> "Our communication with them, allowing the families to prepare. I think we do that really poorly, we don't engage them in the conversation. What is this going to look like for the family? How are they going to support this person? Are they living in a multi-storey apartment? Have they got a mode of transport? How are they going to cope? So it's about us understanding what it is for the patient and their family when we are discharging them." Senior operational management

The process of a patient being cleared for discharge was also discussed. A patient is cleared for discharge when the treating team believes the presenting complaint has been addressed, or treatment goal has been met, and that the patient is safe to go home as they do not require hospital level care for their recovery.

> "I consider it when they don't have any active medical problems. When they can eat and drink, when they can mobilize, do toileting, whether that means maybe looking after a new stoma or whatever. And they're off anything IV, any sort of infusion. Basically, if they're able to manage at home by themselves, or they've got someone at home who can help them manage and function well. Then I would consider them ready for discharge." Surgical fellow

Participants also agreed that discharge readiness extends beyond clinical parameters to include the patient's wholistic needs.

> "They might be clinically ready for discharge, but they've got other factors, social issues or whatever, they're not ready for discharge…we need to discharge people safely and I would never want to discharge somebody back to a situation that they're not going to be safe. So it's making sure that they've got all the bases covered; their spiritual stuff, the social stuff, their clinical-physical things." Charge nurse manager

If a patient is ready to leave acute care, but is not yet ready to return home, there are several different types of discharge options that can be put in place, as described in this quote.

> "If it's something where they just maybe need a little bit more time. You can look at something like rest and recuperation services, if you think they need more time… looking at convalescent care…or rehab. So, we've got quite a few discharge options." Physiotherapist

Finally, transport following discharge was discussed as a cause of discharge-delay. The hospital this study took place in is a large tertiary centre which services a large geographical area, adding unique challenges to the transport part of the patient journey.

> "Transport is a big issue. Whether that be an ambulance, car, helicopter or plane, we use all of those on a daily basis, and it's an expensive resource and it's a finite resource as well. So, we may have six patients to go back to Taranaki. But we can't get six patients back because they don't have the resource, they don't have enough flights for the day or whatever it might be. So that's a bit of an issue." Executive nursing management

Theme 3: Improving discharge

Communication between the medical team in the form of ward round notes was frequently implicated as a cause of delay, as afterhours house officers may not be able to understand and carry out the documented plan due to illegibility or vagueness, or they may not feel confident to discharge the patient due to lack of experience. Participants felt that this could be improved through clear documentation.

> "I think if you're if you're leaving clear plans for that person, then that shouldn't be an issue…The evening house officer just has no idea of the patient, and they're busy and they're being called to lots of other places, they don't have time to sit down actually and work it out… and so often the safer thing is to say 'she's staying'." Surgical fellow

Participants also highlighted the timing of surgical diagnostics and treatments as an area that could be optimised. In an optimal system, the treating team has all the all the diagnostic data available at the time of the ward round in the morning and can make a discharge decision based on this. In some cases where diagnostic imaging and blood test results are not available at the time of the ward round, discharge is delayed.

> "I think the bloods in this hospital take way too long, and I've worked at four other hospitals. So the bloods don't get done till like 1100, 1200, and sometimes never come back till 1400. And not necessarily everyone needs bloods early in the morning, but I think, especially our surgical patients, that the bloods determine the plan for that day." House officer

Participants suggested that the discharge process could be easily improved by routinely taking bloods at 0600 for patients who are likely to be discharged, so that the results are available on the morning ward round. The way in which discharge paperwork is completed was also consistently criticised as unnecessarily time consuming, as explained in this quote comparing a computer based system to the discharge system utilised in the hospital studied. Utilising a different computer programme may reduce discharge-delay.

> 'We just literally copy the admission or the presentation, paste it into our discharge summary, write the progress and plan, and then we hit print, and it's all done. And so that's much quicker than for us to actually type out the entire admission note that the registrar has done and then the progress and plan. I don't see why we can't implement admission notes that are typed on the computer, that will make it a lot quicker for the discharge summaries." House officer

Alternatives to house officers completing discharge, such as nurse led discharge (NLD) and criteria-based discharge (CBD) were discussed as appropriate for some patient cohorts. However, participants citied instances where these systems had been trialled unsuccessfully because although NLD and CBD sped up the process of clearing the patient for discharge, discharge continued to be delayed due to delays in the completion of discharge paperwork by the medical team.

> "We did work on nurses facilitated discharge, like criteria-based discharge. If the patient's "this, this, this, and this, they can go home," but you still had to wait for the doctor to do the prescription and the discharge letter. So it didn't really speed up discharge." Senior operational manager

Participants attributed a great degree of discharge-delay to medical staff not having time to complete the tasks required for a patient to be discharged, specifically the paperwork, and suggested that introducing staff resource specifically dedicated to discharge would improve this. One participant believed a Nurse Practitioner would be most suitable in this role.

> "I'd like to implement a nurse practitioner for general surgery, who (independently) admits and discharges and does discharge paperwork and doesn't operate, and that could facilitate all the discharges in a timely manner. I think that would make a big difference because they wouldn't be pulled in all those different directions. They would have a focus on discharging patients home, making sure that they're safe, that they're ready to go home, and that it's all done." Senior Operational Manager

Alternatives such as a discharge coordinator or allocated house officer were also discussed. However, neither of these were thought to be viable options as a discharge coordinator would not be able to independently complete discharge paperwork, and a house officer would likely be rerouted to other urgent tasks.

Finally, the usage of the studied hospitals 'Transit Lounge' was discussed as a way to reduce discharge-delay. Participants agreed that all patients who are suitable to wait in transit lounge should be transferred there as soon as they have received their discharge paperwork. Some participants felt that patients should wait in transit lounge for their paperwork, however the doctors interviewed stated that this was too difficult logistically.

> "It's really underused. I mean, they've got significant capacity there that they could be, you know, taking a lot more patients. It's just a really underutilized area. If you look at the hospital only about 10% of our discharge patients go through transit lounge. . .40 – 50 % (is the goal)" Executive nursing director

QUANTITATIVE FINDINGS

A total of 40 patients were audited during the two-week period, with an overview of their demographic data presented in Table 2.

TABLE 2: PHASE TWO SAMPLE DEMOGRAPHIC DATA

Variable	Results (%)
Respondents	40
Gender count	
Female	32 (80)
Male	8 (20)
Gender diverse	0
Ethnicity count	
Māori	9 (22.5)
NZ European	26 (65)
Other	5 (12.5)
Shift discharge count	
AM	25 (62.5)
PM	15 (37.5)
Night	0

From the interviews a total of 21 factors were identified as potential causes of discharge-delay and these were added to the survey. These factors were supported by the reviewed existing literature the ensure the survey was comprehensive. Through the survey process, the occurrence frequency of these factors was recorded. Of these factors, the one that occurred most frequently was 'waiting for paperwork' followed by 'waiting for transport'. The remaining 19 factors were recorded between one and four times. Several factors were included in the survey form as potential causes of delay but were never attributed as causing delay. The potential delay causing factors and their occurrence rates are outlined in Table 3.

 https://doi.org/10.37464/2025.422.1291

TABLE 3: DISCHARGE DELAY FACTOR FREQUENCY

Discharge delay factors	Count (%)
Waiting for paperwork	22 (55)
Transit lounge	4 (10)
Transport	17 (40)
House officer availability	3 (7.5)
Waiting for transfer acceptance	1 (2.5)
Medical review	3 (7.5)
Registered nurse review	3 (7.5)
Patient concerned	1 (2.5)
Whānau concerned	1 (2.5)
Pt deteriorated	1 (2.5)
Discharge if no change	1 (2.5)
Discharge pending bloods	1 (2.5)
Wound/dressing	1 (2.5)
Waiting for post-acute bed	0 (0)
Communication issues	0 (0)
Waiting for OPAL/DSL	0 (0)
Registered nurse concern about discharge	0 (0)
Waiting for Physiotherapy clearance	0 (0)
Waiting for Occupational therapy clearance	0 (0)
Waiting for Social work clearance	0 (0)
Waiting for Dietician clearance	0 (0)

Non-productive time

The quantitative data highlights the significant amount of non-productive admission time occurring on the sampled ward. Across the 40 patients sampled there was a total of 10,185 minutes of discharge-delay recorded, with a mean delay per patient of 255 minutes (4.25 hours). Each of the 17 surgical beds on the ward has the maximum potential of 8,760 hours per year. The 17 beds (calculated at 85% capacity) can accommodate a total of 2,637 patients using a mean length of stay of two days. If each patient has a mean 4.25 hours of discharge-delay as seen in the audit, removing this delay would generate 11,207 hours (467 days) in total over the year, potentially allowing for a further 233 patients to be admitted to the ward over the year.

DISCUSSION

The study results revealed that the most significant cause of discharge-delay is delay in the completion of discharge paperwork (55% occurrence), followed by transport related delays (40% occurrence). Other factors implicated in the study as causes for delay included team dynamics, communication, discharge planning, and multi-disciplinary team input, however these were not shown to be as prevalent as paperwork delays and transport delays. Underpinning all the factors identified in this study as causes of discharge-delay were the themes of staffing and workload. While the listed factors consistently cause discharge-delay, their effect is catalysed in systems where workload is high and/or staffing is in deficit.

This study demonstrated that discharge-delay within the ASU is extensive, with a total of 10,185 minutes of discharge-delay recorded over the two-week audit period equating to a mean delay of 255 minutes. Literature supports the argument that discharge-delay such as this impacts the patient directly and indirectly, as well as the hospital organisation through poor patient flow and loss of potential bed days.[9–14,28]

Two previously published studies had a similar research purpose to this study and focused on measuring the amount of discharge-delay that occurred after a patient had been declared medically dischargeable. Of these two studies Cai et al recorded a mean delay of 1.5 days,[29] while Roberts et al recorded a mean delay of 4.8 days.[25] These results demonstrate a markedly longer mean delay time compared to the 4.25 hours seen within this study. These differences may relate to differences in patient cohorts across the studies. This study's cohort was mainly medium acuity general surgical patients, who typically do not have complex discharge planning needs compared to other medical specialties such as the Trauma and Neurology patients studied by Cai and Roberts respectively.[25,29] Furthermore, these two studies focused on unnecessary bed days spent on the ward, recording 15 percent and 39 percent of patients as experiencing delay, while this study recorded delay in hours, and included any amount of time remaining on the ward past the point of medical clearance as discharge-delay, resulting in 100 percent of the population being recorded as experiencing some degree of delay, despite some patients recorded as experiencing as little as five minutes of delay.[25,29] When only 'significant delay' is considered, a delay of greater than 12 hours, this study's results are more comparable with previous work, with only 7.5 percent of patients experiencing significant discharge-delay and a mean delay of 18.2 hours within this subgroup.

Within the qualitative data, participants suggested a range of ideas to reduce discharge-delay, which largely aligned with previous research into discharge delay.[5,8,30] Interventions related to discharge anticipation included appropriate transfers to the hospital, discharge planning, patient and family/support people engagement, and the optimisation of the timing of diagnostic tests. Interventions related to medical clearance and the discharge process itself included improving communication and the need to improve discharge paperwork. A range of improvements were suggested, including not writing discharge summaries for all patients, improving the software and process of writing discharge paperwork, and the introduction of a 'discharge focused clinician'. The participant suggestions related to

discharge paperwork and a 'discharge focused clinician' were novel, and had not been identified in previous literature at the time of the study. Interventions post medical clearance were also suggested such as streamlining transport resources, and optimising transit lounge. These results suggests that a cohesive, system wide approach to minimising discharge-delay is required, with specific emphasis on discharge paperwork and the effective utilisation of a transit lounge.

THE PATIENT JOURNEY OPTIMISED FOR DELAY REDUCTION

Taking the data into account, a patient journey optimised for discharge was developed and is outlined in Figure 3. The area circled in blue demonstrates the time period from medical clearance to discharge, and the elements of discharge that must happen concurrently, or as close together as possible in order to avoid discharge-delay. The brackets indicate the concepts of communication and appropriate resourcing that must underpin the system in order for it to function.

THE DISCHARGE PAPERWORK BOTTLENECK

Discharge paperwork has been identified in this study as the most frequently occurring contributor to discharge-delay, with 55 percent of patients experiencing discharge-delay related to waiting for discharge paperwork. However, its impact is greater than its occurrence rate because of its effect on the overall discharge journey. Within the discharge process at the studied hospital, discharge paperwork is the final requirement for a patient to leave the acute environment, only followed by the patient being transported home. Because of its position within the discharge process, discharge paperwork acts as a bottleneck; a patient may experience an otherwise perfectly optimised discharge journey and yet experience several hours of delay attributable solely to paperwork delays. This bottle neck must be addressed as part of a system wide approach to minimising discharge delay. If other improvements are made without addressing discharge paperwork, any gains made by these interventions will be annulled by the ongoing inefficiency of the paperwork process.

Introducing a 'discharge focused clinician', who can independently complete simple discharges after the primary team has declared the patient to be medically dischargeable may open the bottleneck. One interview participant suggested that this role would be best filled by a Nurse Practitioner. However, it is possible that other staff members, such as a Clinical Nurse Specialist, could also effectively fill the role if they were able to independently complete the entire discharge, including prescription, without requiring additional sign off from a doctor. Although the role could also be filled by a dedicated Junior Doctor participants expressed concern that this would not solve the issue, because they may be reallocated to other important medical tasks. Instead, introducing a 'discharge focused clinician' whose primary job is to discharge would allow for the protected prioritisation of discharge. It can be argued that for the right population, such as certain simple general surgical patients, discharge could be safely completed autonomously by an appropriately trained nurse. CBD works along similar conceptual lines and has been demonstrated to be effective when applied to the right population and carried out by appropriately trained staff.[23,31] While CBD usually involves a patient being assessed

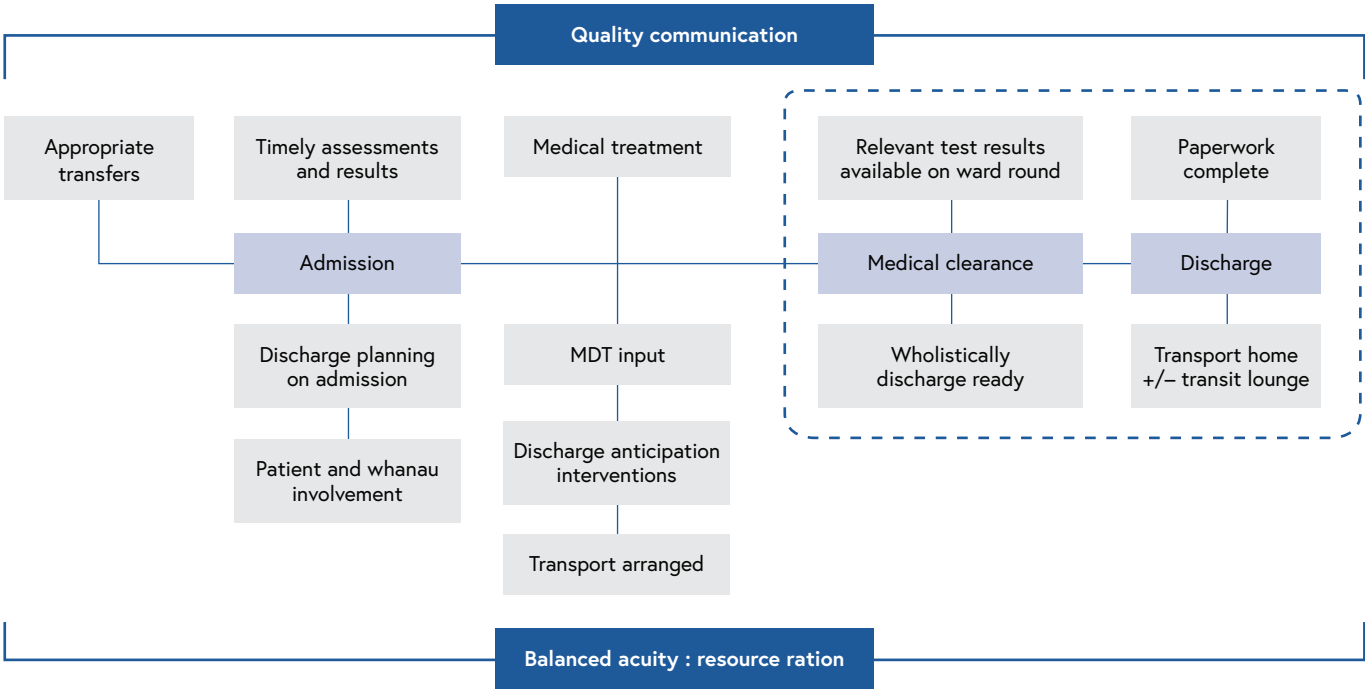

FIGURE 3. OPTIMAL PATIENT JOURNEY

 https://doi.org/10.37464/2025.422.1291

against a predetermined set of criteria by their primary nurse,[32] the system suggested by participants in this study would involve the primary medical team declaring the patient for discharge, and if they were an appropriate candidate for the discharge focused clinician, the associated paperwork and other discharge activities would then be completed by this staff member. Participants did not favour CBD as a solution to the discharge-delay bottle neck, because within the studied hospital, it had been trialled unsuccessfully because the discharge paperwork still required completion by a doctor. The advantage of a discharge focused clinician would be their ability to autonomously complete the relevant paperwork including the discharge letter and prescription. Nurse prescribing is increasing, with research supporting positive impacts on patients and organisations,[33] therefore nurse prescribing within a discharged focus clinician role may be appropriate and effective. This appears to be a novel concept and no literature on the topic was able to be identified. Further research into the feasibility of a discharge focused clinician, or similar concept is required to test whether this would be an effective solution to removing the discharge-delay bottleneck. Any intervention aimed at reducing discharge-delay due to paperwork delays needs to enable discharge paperwork to be rapidly completed following medical clearance. Further research into interventions that would support this goal may generate other novel ideas.

Although discharge paperwork was identified as a clear bottleneck within this population and hospital system, the same issue may not be present in other patient populations or health systems. This research highlights the importance of identifying the most prevalent cause of discharge-delay in a health system prior to initiating a reduction intervention. This concept is echoed throughout the literature where discharge-delay reducing interventions are not always proved effective.[34] An intervention that is successful in one system may not succeed in another if it is targeting the wrong cause of delay.[35] Instead, developing proposed solutions after the local systems causes of discharge-delay have been identified, such as was achieved in this study, may produce more successful interventions.

CONCLUSION

Optimisation of patient discharge is essential as it impacts both the patient and the entire health system. Patients should be discharged as close as possible to the time they are declared medically stable and safe to leave the inpatient environment. This study sought to fill a research gap through a mixed-methods study design, combining both qualitative and quantitative methodologies. The study design involved two phases, the first explored the research questions through interviews, while the second phase measuring the extent of discharge-delay and the causes of it. At the completion of phase one, through the process of thematic analysis, the data was condensed into three core themes:

(i) It takes a village to discharge a patient;

(ii) Preparation, clearance, home; and

(iii) Challenges and solutions to discharge delay.

The concepts that emerged within these themes informed the development of the audit and survey, which over a two-week period, recorded a mean delay of 255 minutes, or 4.25 hours, per patient. Within the study population, the most frequently occurring factor was 'waiting for paperwork' (55%) followed by 'waiting for transport' (40%). Triangulating the qualitative and quantitative data resulted in an understanding of how best to reduce discharge-delay in the studied hospital: a system wide focus on discharge across the entire patient journey with particular focus on the bottleneck of discharge paperwork, potentially through the introduction of a discharge focused clinician who can autonomously discharge patients following medical clearance. This research highlights the importance of identifying the most prevalent cause of discharge-delay in a health system prior to initiating a reduction intervention.

LIMITATIONS

The study design resulted in limitations in the precision of the quantitative data, as method of time recording potentially limited the consistency of time recordings. The method used in this study worked effectively for patients who were cleared for discharge on the morning ward round as the nurse would either have been on the round or could refer to the notes to see the time medical clearance was documented. However, for patients who were cleared for discharge later in the day, for example, postoperatively, or after diagnostic tests, the time of medical clearance was more difficult to pinpoint, as medical clearance may not be immediately communicated to the nurse. If resources allowed, the researcher being always present on the ward during the audit period to track the discharging patients may have allowed for more consistency across the time recordings. The study timeframe also limited the way factors were attributed to delay. The study method effectively captured the occurrence rate of many potential causes of discharge delay; however, eight factors were included in the audit based on the themes derived from the qualitative data but were never recorded during the audit. This is not to say that these features do not ever delay discharge, however they were not captured within the two-week audit period, implying that these factors may not occur frequently. A longer audit period may better reveal their occurrence frequency.

Acknowledgements: Noel Watson, Deputy Director of Nursing, Te Whatu Ora – Waikato district, Jane Monsma, Nurse Manager – Surgery and Anesthesia, Te Whatu Ora – Waikato district

Funding Support: Health Workforce New Zealand

Declaration of conflicting interests: None

REFERENCES

1. Rojas-García A, Turner S, Pizzo E, Hudson E, Thomas J, Raine R. Impact and experiences of delayed discharge: a mixed-studies systematic review. *Health Expect.* 2018;21(1):41-56.
2. Micallef A, Buttigieg SC, Tomaselli G, Garg L. Defining delayed discharges of inpatients and their impact in acute hospital care: a scoping review. *Int J Health Policy Manag.* 2022;11(2):103-111.
3. Waring J, Marshall F, Bishop S, Sahota O, Walker M, Currie G, Fisher R, Avery T. An ethnographic study of knowledge sharing across the boundaries between care processes, services and organisations: the contributions to 'safe' hospital discharge. Southampton (UK): NIHR Journals Library; 2014
4. Abuzied Y, Maymani H, Almatouq B, Aldosary O. Reducing the length of stay by enhancing the patient discharge process: using quality improvement tools to optimize hospital efficiency. *Glob J Qual Saf Healthc.* 2021;4(1):44-9.
5. Luther B, Wilson RD, Kranz C, Krahulec M. Discharge processes: what evidence tells us is most effective. *Orthop Nurs.* 2019;38(5):328-33.
6. Rojas-García A, Turner S, Pizzo E, Hudson E, Thomas J, Raine R. Impact and experiences of delayed discharge: a mixed-studies systematic review. *Health Expect.* 2018;21(1):41-56.
7. Gaughan J, Gravelle H, Siciliani L. Testing the bed-blocking hypothesis: does nursing and care home supply reduce delayed hospital discharges? *Health Econ.* 2015;24(S1):32-44.
8. Modas DAS, Nunes EMGT, Charepe ZB. Causes of delayed hospital discharge among adult clients: a scoping review. *Rev Gaucha Enferm.* 2019;40:E20180130.
9. Morley C, Unwin M, Peterson GM, Stankovich J, Kinsman L. Emergency department crowding: a systematic review of causes, consequences and solutions. *PLOS One.* 2018;13(8):E0203316.
10. Ardagh M. A comprehensive approach to improving patient flow in our hospitals – the 'left to right, over and under' concept. *NZ Med J.* 2015;128(1420):55-64.
11. Mcintyre D, Chow CK. Waiting time as an indicator for health services under strain: a narrative review. *Inquiry.* 2020;57:004695802091030.
12. Bai AD, Dai C, Srivastava S, Smith CA, Gill SS. Risk factors, costs and complications of delayed hospital discharge from internal medicine wards at a Canadian academic medical centre: retrospective cohort study. *BMC Health Serv Res.* 2019;19(1):935.
13. Rosman M, Rachminov O, Segal O, Segal G. Prolonged patients' in-hospital waiting period after discharge eligibility is associated with increased risk of infection, morbidity and mortality: a retrospective cohort analysis. *BMC Health Serv Res.* 2015;15(1).
14. Everall AC, Guilcher SJT, Cadel L, Asif M, Li J, Kuluski K. Patient and caregiver experience with delayed discharge from a hospital setting: a scoping review. *Health Expectat.* 2019;22(5):863-73.
15. Micallef A, Buttigieg Sc, Tomaselli G, Garg L. Defining delayed discharges of inpatients and their impact in acute hospital care: a scoping review. *Int J Health Policy Manag.* 2020.
16. Edenharter G, Gartner D, Heim M, Martin J, Pfeiffer U, Vogt F, et al. Delay of transfer from the intensive care unit: a prospective observational analysis on economic effects of delayed in-house transfer. *Eur J Med Res.* 2019;24(1).
17. Bagshaw SM, Tran DT, Opgenorth D, Wang X, Zuege DJ, Ingolfsson A, et al. Assessment of costs of avoidable delays in intensive care unit discharge. *JAMA Netw Open.* 2020;3(8):E2013913.
18. Koushan M, Wood LC, Greatbanks R. Evaluating factors associated with the cancellation and delay of elective surgical procedures: a systematic review. *Int J Qual Health Care.* 2021;33(2).
19. Arshad MS, Majeed T, Shah N, Hassan S, Shah S. Elective list cancellations and its financial ramifications. *J Perioper Pract.* 2019;29(1-2):24-6.
20. Buchanan C. Operating theatre management in New Zealand in: Pandit JJ, Editor. *Practical operating theatre management: measuring and improving performance and patient experience*: Cambridge University Press; 2018. P. 124-5.
21. Yam CH, Wong EL, Cheung AW, Chan FW, Wong FY, Yeoh EK. Framework and components for effective discharge planning system: a Delphi methodology. *BMC Health Serv Res.* 2012;12:396.
22. Wong EL, Yam CH, Cheung AW, Leung MC, Chan FW, Wong FY, et al. Barriers to effective discharge planning: a qualitative study investigating the perspectives of frontline healthcare professionals. *BMC Health Serv Res.* 2011;11(1):242.
23. Lees-Deutsch L, Robinson J. A systematic review of criteria-led patient discharge. *J Nurs Care Qual.* 2019;34(2):121-6.
24. Hendy P, Patel J, Kordbacheh T, Laskar N, Harbord M. In-depth analysis of delays to patient discharge: a metropolitan teaching hospital experience. *Clinical Medicine.* 2012;12(4):320-3.
25. Roberts DE, Holloway RG, George BP. Post-acute care discharge delays for neurology inpatients. *Neurol Clin Pract.* 2018;8(4):302-10.
26. Palinkas LA, Mendon SJ, Hamilton AB. Innovations in mixed methods evaluations. *Annu Rev Public Health.* 2019;40(1): 423-42.
27. Östlund U, Kidd L, Wengström Y, Rowa-Dewar N. Combining qualitative and quantitative research within mixed method research designs: a methodological review. *Int J Nurs Stud.* 2011;48(3):369-83.
28. Derose SF, Gabayan GZ, Chiu VY, Yiu SC, Sun BC. Emergency department crowding predicts admission length-of-stay but not mortality in a large health system. *Med Care.* 2014;52(7):602-11.
29. Cai C, Lindquist K, Bongiovanni T. Factors associated with delays in discharge for trauma patients at an urban county hospital. *Trauma Surg Acute Care Open.* 2020;5(1):E000535.
30. Lenzi J, Mongardi M, Rucci P, Ruscio ED, Vizioli M, Randazzo C, et al. Sociodemographic, clinical and organisational factors associated with delayed hospital discharges: a cross-sectional study. *BMC Health Serv Res.* 2014;14(1):128.
31. Boden I, Peng C, Lockstone J, Reeve J, Hackett C, Anderson L, et al. Validity and utility testing of a criteria-led discharge checklist to determine post-operative recovery after abdominal surgery: an international multicentre prospective cohort trial. *World J Surg.* 2021;45(3):719-29.
32. Lees-Deutsch L. Dispelling myths around nurse-led and criteria-led discharge. *Nurs Times.* 2018;114(4):32-5.
33. Creedon R, Byrne S, Kennedy J, Mccarthy S. The impact of nurse prescribing on the clinical setting. *Br J Nurs.* 2015;24(17):878-85.
34. Coffey, Leahy W, Savage, Hegarty, Cornally, Day, et al. Interventions to promote early discharge and avoid inappropriate hospital (re)admission: a systematic review. *Int J Environ Res Public Health.* 2019;16(14):2457.
35. Kreindler SA. Six ways not to improve patient flow: a qualitative study. *BMJ Qual Saf.* 2017;26(5):388-94.