Exploring discharge delay post medical clearance in an acute surgical unit

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A mixed methods study investigating causes, impact, and potential solutions to discharge delay within Waikato Hospitals acute surgical short stay unit.

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Abstract

Background: Within the hospital system, efficient patient flow is essential. 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. 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 with delayed admissions, slowed theatre schedules, and bed blocking in critical care, as well as negatively impacting on patient experience. In the context of a public health system under pressure, reducing discharge delay is critical to improving overall function of the system. This study aims to explore the features in the context of an acute surgical unit that cause discharge delay, the impacts of discharge delay, and the ways discharge delay could be minimised.

Methods: A two phased, mixed methods design was employed in this research. Phase one obtained qualitative data through semi-structured interview with staff members occupying different roles within the health care team within Te Whatu Ora – Waikato. Themes derived from phase one informed the development of an audit form utilised in phase two, which collected quantitative data through its completion by registered nurses working in the acute surgical unit during the two-week audit time period. This audit recorded discharge related times and delaying factors that occurred for all the patients discharged from the ward during the audit period.

Findings: Interviews were undertaken with nine participants (Hospital management n=2, Acute Surgical Unit management n=2, Registered Nurse n=1, Surgical Fellow n=1, Surgical Registrar n=1, Surgical House officer n=1, and multi-disciplinary team member n=1). Thematic analysis of the 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 44 Registered Nurses and on analysis revealed a mean patient delay of 225 minutes, or 3.75 hours. For the audited patients, the most frequently occurring factor was 'waiting for paperwork' (55%) followed by 'waiting for transport' (40%).

Conclusions: This study found that to reduce discharge delay a coordinated, system-wide approach with discharge focused optimisation across the entire patient journey, and particular focus on reducing the amount of delay caused by discharge paperwork, is required. Introducing a 'discharge-focused clinician', would effectively reduce discharge delay by ensuring the prioritisation of discharges, allowing discharge paperwork to be completed promptly. In addition to the introduction of a discharge-focused clinician, the systems and policies surrounding discharge paperwork could also be improved. Additionally, improving the utilisation of transit lounge by routinely sending all appropriate patients to transit lounge to wait for their transport, will also reduce discharge delay.

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Contribution

I, the researcher undertook all aspects of this study under the direct guidance of my supervisors. This entailed selecting the appropriate research design, the data collection and analysis, and the publishing of the findings in this thesis.

Dedication

This thesis is dedicated to my parents, Keith and Anita Voogt. In all my years of education, I can still say I've learnt the most from my Mum and Dad. They instilled in me a love of learning, and a love for people. It is these two things that have inspired me to pursue this path, and I am forever grateful to them.

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Chapter I: Introduction

> *"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."*
>
> Marie Curie

Optimisation of patient flow through hospital services is a pertinent concern within today's health care systems. Ensuring that patients have access to services in a timely manner is fundamental to providing quality care, therefore moving patients along their treatment journey efficiently is essential. The most frequently implicated cause of suboptimal patient flow is discharge delay. Discharge delay occurs when patients remain in the acute care setting beyond the time in which they are medically fit to leave this environment. This phenomenon retains patients in hospital unnecessarily, while preventing other patients from accessing acute services – a process known as 'access block.' Minimising discharge delay is the key to improving patient flow and service access. This research aims to identify the causes of discharge delay, explore the impact of discharge delay, and discuss the ways in which discharge delay can be reduced. This chapter will introduce the study by discussing the research context, followed by the research questions, and the research significance.

Within Aotearoa – New Zealand, demand for acute care is increasing due to the nations ageing population and rising rates of comorbidities. Simultaneously, resources are being increasingly stretched as health care worker numbers decrease. The resulting desynchrony of supply and demand has put the health care sector under pressure, highlighting the need to use the resource which are available as efficiently as possible (Ministry of Health, 2018). Hospitals are complicated organisations with many services and processes that must work 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 the hospital. For this reason, focusing on this 'leaving' portion of the patient journey is essential to improve patient flow and overall hospital function.

Discharge delay occurs when patients remain in the acute hospital environment beyond the time they are medically fit to be discharged from acute care. This prevents acutely presenting patients from being admitted, while retaining non-acute patients in hospital unnecessarily. The effects of this phenomenon are far reaching, impacting the entire hospital system. When bed spaces in wards cannot be made available, patients who present to the hospital acutely via the emergency department (ED) cannot be admitted to them and instead must remain in ED. This results in overcrowding, stretched resources, and increased wait times within the department. Elective treatment is also impacted, as elective surgery cannot take place without a bed to admit a patient to post-operatively (Ardagh, 2015). Similarly, critical care is impacted by discharge delay as patients cannot be stepped down from the intensive care or high dependency units if there are no appropriate ward beds available. In this way, discharge delay increases the hospital above ideal operational capacity and increases its overall acuity resulting in stretched resources, long wait times, and care rationing.

Considering the significant effects of discharge delay, minimising its occurrence must be a priority for hospitals in order to optimise patient flow. A significant body of literature exists on the topic establishing the effects of discharge delay on both the hospital and patient, and the importance of minimising it. 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 helpful solutions, and evident gap remains. Little research has focused on the period between when a patient is medically cleared for discharge and the time that they leave the acute environment. Anecdotally, most patients remain in the acute environment for several hours after they are deemed dischargeable, with staff attributing these delays as responsible for obstructing patient flow. Although this may not appear to be a significant amount of delay per patient, cumulatively it may have a significant impact on the overall patient flow of the organisation. Understanding the features that cause delay in the time patients leave the acute environment after they are cleared for discharge is important as reducing these delays could result in significant improvements in patient flow throughout the organisation.

This study aims to explore the causes and impact of discharge delay, as well as potential solutions to it, by focusing specifically on the time period between medical clearance and the patient leaving the acute environment. The following research questions will be answered within this research.

1. What are the features that cause discharge delay in an acute surgical unit
2. What is the impact of discharge delays in an acute surgical unit
3. How can discharge delays be minimised in an acute surgical unit

Understanding the causes and effects of discharge delay, and the potential ways to reduce it, will inform the development of systems and policy as well as lay the foundation for future research into this important concept.

Chapter II: Literature review

> *The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them.*
>
> William Lawrence Bragg

2.1 Introduction

Admission to an acute inpatient environment is a necessary and appropriate mode of treatment for many acute conditions. However, the goal of treatment is to treat. Patients are not admitted to hospital with the intention of remaining there, rather they are admitted with the goal of being discharged when the individual is well. Patient discharge is an essential component of the patient journey. Recognising this, a significant body of work exists which explores the many facets of optimised patient discharge, and the importance of this.

The process of reviewing relevant literature by critically examining and considering its themes lays a necessary foundation for further research. It reveals existing themes, provides scope for exploring gaps in the research, and inspires further research and innovation. This literature review will draw from this body of work to explore the factors that impact discharge times and establish an understanding of what optimal discharge time entails. The causes of discharge delay and the impact of this delay will be explored, covering both factors related to the patient, and factors related to the health care system. In response to this, means of optimising discharge will also be discussed.

2.1.2 Literature search

A comprehensive literature search was carried out across several search engines and data bases including Pubmed, CINAL, Medline, Google Scholar, Science Direct, Biomed Central, Springer, and Proquest. The articles titles and abstracts were considered for their relevance to the concepts discussed in this literature review. Articles which were deemed relevant were then examined in greater depth and included or disregarded where appropriate. Search terms utilised included length-of-stay,

discharge-delay, premature-discharge, patient-discharge, discharge-planning, equity, criteria-based-discharge, nurse-led-discharge, effect, causes, impact, age, comorbidity, bed-blocking, service-availability, communication, capacity, ward-round, acute-surgical-unit, and post-acute-care. These terms produced an array of results, however these were narrowed by searching within the years 2011 to 2021, as well as by including limiting terms such as New Zealand, and Surgical. Articles not written in English were excluded. The following discussion will critically analyse and review the assorted articles gathered from these search terms.

2.1.3 Definitions of terms

Prior to considering patient discharge, it is necessary to define the terms and features involved. Central to this discussion is the 'role of the patient'. The Ministry of Health defines a patient as, "A person booked to receive or receiving healthcare resulting from direct contact with a healthcare provider where the healthcare results in the use of resources associated with observation, assessment, diagnosis, consultation, rehabilitation or treatment" (Health and Disability Intelligence, 2014pg. 21). This definition encompasses the role of the patient along the entire possible patient journey, essentially defining a patient as any person utilising health care services at any time. As it pertains to this thesis, a patient refers to a person admitted to an acute inpatient environment for health care.

The term 'acute' refers to assessment and treatment that is required immediately, and is delivered unplanned, on the day of admission. In contrast, elective treatment is care which is required less urgently and can be scheduled for a later date, seven or more days after the treatment decision has been made (Ministry of Health, 2019), (Health and Disability Intelligence, 2014).

Equally important to distinguish is the difference between the terms 'in-patient', 'day-stay' and 'out-patient'. Hospitals within Aotearoa-NZ provide treatment to patients in one of these three ways, with in-patients being admitted at least overnight to the hospital for treatment, day-stay patients being admitted and discharged within the same day, and out-patients accessing services via clinics without being admitted to hospital (Ministry of Health, 2013). This literature review will relate primarily to in-patients,

with some evidence from day-stay cases considered, while the patients involved in the study itself will be exclusively in-patients.

Although relevant literature will be reviewed pertaining to a range of medical specialties, the key focus of this study will be patients discharged from an acute adult general surgical ward, of a large tertiary Hospital in the North Island. As described by the Medical Council of New Zealand, general surgical specialises in medical conditions related to the "colon and rectum, gastro-intestinal organs, breasts, endocrine organs, skin and subcutaneous structures, blood vessels and the head and neck region. It also includes the early and ongoing management of trauma" (Medical Council of New Zealand, 2021). Within a general surgical ward, these conditions are diagnosed and treated either operatively or non-operatively with patients returning home once they are discharged from acute care.

'Patient discharge' is the point where inpatient hospital care is completed, with the patient either returning home with no further care required, or with care continuing in some capacity but within a non-hospital environment (Waring et al., 2014). The process of achieving patient discharge is determined by many interdependent factors which will discussed within this literature review. Of these factors, two are particularly helpful to define; discharge planning and patient education.

'Discharge planning' is a multidisciplinary process of coordinating patient transition from hospital to home. It is a wholistic link between care provided in hospital, and care provided within the community (Lin et al., 2012). Discharge planning is not a passive process, rather, it is a specific and deliberate intervention involving "communication, coordination, education, patient participation and collaboration between medical personnel" (Carroll & Dowling, 2007). Equally important for patient discharge is patient education, the process of providing the patient and / or their carers with all the information they require to continue to manage their health outside of the in-patient environment. This process is essential in order to minimise post-discharge complications and avoid readmission (Ashbrook et al., 2013)

Finally, 'length-of-stay' is defined by the Ministry of Health as "The time in days between admission to hospital 'X' and discharge, death or transfer from hospital 'X', minus leave days from hospital 'X' (Health and Disability Intelligence, 2014). It is important to note that this definition limits length of stay to the time from admission, rather than from presentation. Typically, patients present to the Emergency Department prior to admission, there they are assessed and the decision to admit is made. The time period between presentation and admission is referred to as the Emergency Department length of stay, another important concept to consider as it relates to patient discharge (Ministy of Health, 2018).

Part 1: Patients must go home at some point

2.2 Introduction

Optimisation of patient discharge is essential as it has significant implications for both the patient and the entire health system. Ideally, patients are discharged at the time they are declared medically stable and safe to leave the inpatient environment. However, this is not always the case, with patients either discharging before the point of safe discharge, or several hours or days after. The flow-on effects of poor optimisation of patient discharge are extensive, however, by exploring the many causes and effects of both premature and late discharge, some light may be shed on this pertinent topic. The challenge is to establish what the parameters of optimal length of stay are, how they vary for each individual patient and how to achieve discharge within these parameters in order to achieve optimisation. The following section will discuss the concepts of premature discharge, delayed discharge, and the effects of these on both the patient and the health care system.

2.3 Premature discharge

Reducing length-of-stay (LOS) is a priority across health systems globally. Decreasing LOS is touted as a marker of increased efficiency; however, decreased LOS is only truly efficient if it can be achieved without compromising quality. Although an expeditated LOS could be considered a marker of high quality and efficient peri-operative care (Regenbogen et al., 2017), if LOS is decreased at the cost of appropriate patient care, readmission and / or post-discharge complications are more likely to occur, ultimately adding time and resources to the patient's overall treatment requirement (Kaboli et al., 2012).

There are two main areas in which discharge can be considered premature; discharge before the patient is clinically ready, and discharge before the patient is safe to leave the acute environment. Clinical discharge readiness is determined by medical criteria relevant to the patient's illness, its severity and their treatment pathway. These criteria include common factors such as symptom management, mobility, laboratory results and vital signs (Ubbink et al., 2014), as well as pathophysiology and treatment specific criteria such as bowel function, oral intake, and stoma management (Fiore et al., 2012).

However, a patient may meet these discharge criteria and yet be unsafe to discharge. As such, assessing a patient's wholistic discharge readiness is equally important. Consideration of their personal status, health knowledge, ability to cope, and support systems determine whether or not a patient can be safely discharged from the acute environment (Weiss et al., 2019). Typically, this assessment is primarily nurse led, with input from the patient and patient family members (Weiss et al., 2010). If either of these two areas are inadequately assessed the patient is at risk of premature discharge; leaving the acute environment either before they are clinically well enough, or before they are able to manage at home.

As trends towards shorter LOS have emerged, concerns have been raised about the potential for readmission rates to increase due post-discharge complications arising from premature discharge (Glasby et al., 2008; Gomes et al., 2010; Tevis et al., 2014; Weiss et al., 2010). Studies have validated this concern by demonstrating that patients whose LOS is reduced past the point of safety and discharged prematurely are at greater risk of readmission (Hendren et al., 2011) and post-operative complications (Tevis et al., 2014). However, there is a growing body of evidence across multiple surgical specialties which mitigates these concerns by proving that early discharge, or a shorter LOS, does not in itself adversely affect recovery (Andriotti et al., 2019; Molloy et al., 2017; Oyetunji et al., 2013; Xia et al., 2018; Yuen et al., 2016). This research proves that the issue is not in early discharge, nor a short length of stay, but in premature discharge. It is this line between optimal and premature that must be navigated in the ongoing pursuit of efficiency.

2.4 Delayed discharge

2.4.1 Impact on the patient

Having established the impact of early and premature discharge, the same questions must be asked of delayed discharge. Discharge delay is the period of continued hospital stay after a patient is deemed medically fit to leave hospital but is unable to do so for non-medical reasons (Rojas-García et al., 2018). Despite efforts to reduce length of stay and improve discharge efficiency, delays in discharge continue to occur, with implications for both the patient and the health system as a whole (Bai et al., 2019).

Patients with a longer LOS are at an increased risk of complications. This is in part due to a longer time exposed to an environment that enables these complications. Although hospitals are designed to facilitate health, there are specific features within them that unfortunately foster adverse outcomes. Despite the health care systems best efforts to avoid hospital related compilations, they continue to occur. For example, invasive procedures and treatments such as indwelling catheters, wound management and intravenous therapy, combined with multi-drug-resistant-organisms, produces a high risk of infection within hospitals (Rosman et al., 2015). While admitted to hospital, patients also spend less time mobilising which increased both their risk of developing a pressure area (Majeed et al., 2012), and of deconditioning – leaving hospital with a decreased level of function (Covinsky et al., 2003; Covinsky et al., 2011). Additionally, if a patient is cleared as medically stable, the level of care afforded them may also be decreased as care and resources must be prioritised to more acutely unwell patients (Kuluski et al., 2017). This further increases the risk of developing complications. Although these adverse events could occur at any stage of a patient's admission, the longer a patient stay in hospital, the greater their chances of experiencing one or more of these.

Furthermore, delayed discharge negatively impacts patient experience and their wholistic wellbeing (Hesselink et al., 2012). Patients typically do not want to be in hospital. Unnecessary time spent in hospital waiting to be allowed to go home contributes to feelings of frustration and disempowerment (Everall et al., 2019) as well as feelings of boredom, loneliness, anxiety, and low mood (Rojas-García et al., 2018). Patients are left in an unfamiliar environment in which they remain dependent on their carer's despite feeling ready to manage their care independently. This results in patients feeling disempowered, as the decision of where they are, where they go, and at what time is taken out of their hands (Kydd, 2008).

2.4.2 Impact on the healthcare system

The effect of discharge delay on the health system is equally significant. Delayed discharge impairs patient flow throughout the hospital by retaining well patients in an acute care environment, consequently preventing patients requiring acute care from

accessing it. The impacts of delayed discharge on the health care system are seen most strikingly in two areas: the emergency department and elective admissions.

Optimal hospital bed occupancy is usually considered to be 80 to 85 percent of the total bed capacity (Ravaghi et al., 2020). To maintain this balance, the number of patients admitted to hospital must remain approximately equal to the number of patients being discharged. Patients primarily enter the hospital system either in an emergent context, presenting to the emergency department because of an acute illness of accident, or through the elective system in which they are admitted at a predetermined time for a specific procedure or treatment. When the hospital is operating above optimal numbers due to delayed discharge, among other factors, emergency presentations cannot be stopped or rescheduled, however patients entering the hospital electively can. As such, elective and day stay admissions are often cancelled to reduce pressure on the hospital system. This results in an elective system that consistently runs behind schedule with patients experiencing excessively long wait times for treatment (McIntyre & Chow, 2020). Long wait times have been associated with patient dissatisfaction and anxiety, poorer clinical outcomes, and increased long term costs (McIntyre & Chow, 2020). Although postposing elective surgery often temporarily mitigates a bed-space crisis, the long-term effects on patients and the health care system is detrimental.

Critical care is also impacted by discharge delay. When critical care cannot step down patients due to delayed discharge on hospital wards, patients from other parts of the hospital and the Emergency Department (ED) cannot be admitted to critical care when required (Bagshaw et al., 2020; Edenharter et al., 2019). This leaves patients requiring critical care input on general wards and in ED in an unsuitable environment, requiring more resources than the staff in these environments can safely provide (Forero et al., 2011). Surgery is also effective in this way as certain elective surgeries require a high dependency or intensive care admission post-operatively and cannot take place unless a critical care bed is booked in. When discharge delay occurs on surgical wards, patients cannot be stepped down from critical care onto these wards, resulting in critical care having less available beds than required to facilitate these major elective surgeries. On occasions when these operations do proceed with no critical care bed

to be admitted to post-operatively, patients may remain in the post-anaesthetic care unit until a bed is available or until the patient's condition is sufficiently stable for them to be admitted directly to a surgical ward. This again leave patients being cared for in a suboptimal environment and increases pressure on staff (Bing-Hua, 2014).

While elective services are reduced to manage numbers, emergency departments become more crowded as patients continue to present without beds to admit them to. Emergency numbers cannot be capped so as the number of patients increases, resources must stretch to accommodate them (Affleck et al., 2013). As a result, Emergency Department waiting times lengthen and overcrowding occurs, both of which have been associated with decreased department efficiency and quality of care, as well as an increase in adverse events (Forero et al., 2011). This situation, referred to as 'Bed-blocking' or 'Access-block', is cyclical. Research consistently demonstrates that patients admitted to hospital during periods of ED overload have longer admission lengths, resulting in even less bed availability (Derose et al., 2014; Richardson, 2002). The contributing impact of ED overload are system wide, effecting quality of care, mortality, walkout numbers, and staff stress and performance levels. This phenomena has been labelled a crisis, with bed-blocking repeatedly identified as the primary cause (Morley et al., 2018). Fixing the issue of bed blocking is a complicated issue, however optimising discharge will contribute significantly to solving this problem. The question remains, how is optimal discharge achieved? What are the causes of delayed discharge, and how are they to be addressed?

2.5 Understanding hospital discharge delays

2.5.1 Older age and discharge

Worldwide, many countries, including New Zealand, are experiencing an ageing population. As the population continues to age, the proportion of older people, people ages 65 and older, occupying acute beds will continue to increase. Throughout the literature, age is consistently attributed as a cause of discharge delay (Landeiro et al., 2016). A variety of reasons have been identified for this correlation. Older people take longer to recover from illness, require more continued care (O'Connell Francischetto et al., 2016) and are more prone to hospital related complications such as hospital acquired infection, falls, and deconditioning (Mudge et al., 2019).

Additionally, older people are more likely to have multi-morbidities (Divo et al., 2014) and are also less likely to have a robust social support network meaning that they cannot discharge home until they are able to manage at home independently (Victor et al., 2000). In practice, this means that although an older person may be declared medically fit for discharge, they often are not socially or functionally fit for discharge. In this case, interventions must be put in place to facilitate safe discharge. These interventions may include rehabilitation, home help organisation, or rest home placement all of which often require significant organisation and coordination by multiple parties. This process is essential, nevertheless it is time consuming and may delay discharge by several days. The health system must be prepared to accommodate this growing demographic and to understand their specific needs. Part of this understanding and accommodation must relate to discharge.

2.5.2 Equity and discharge

Equity, or lack thereof, may also have a part to play in in discharge delay (Cai et al., 2020). Equity is a well-established determinator of health outcomes. Within Aotearoa there exists a distinct pattern of health inequities between Māori and Non-Māori across their lifetime attributable to socio-political causes (Reid et al., 2014). It is reasonable to argue that this inequity effects the discharge process. Māori experience on average both greater levels of deprivation and lesser access to primary care which often results in later presentations to acute care. Additionally, when Māori do present for treatment, they receive inequitable access to interventions and quality of care, often reporting negative hospital experiences (Graham & Masters-Awatere, 2020; Jatrana & Crampton, 2009). Later access to services is typically correlated with increased pathophysiological complexity and thus usually requires a longer admission to acute care (Daniel Garofalo, 2012; Seneviratne et al., 2015). Complicated admissions necessitate complicated discharge planning, increasing the likelihood of discharge delays.

Delayed discharge is potentially further increased by various socioeconomic inequities experienced by Māori. Levels of social deprivation, health literacy, and finance all impact on a patient's discharge. For example, a patient with strong whanau supports, a robust understanding of their own health, and the financial means to drive to a GP

if they become unwell post discharge, is significantly safer to discharge than a patient who is socially isolated and does not have reliable transport or financial ability to see a GP. Although research into the impact of inequity on length of stay and discharge delay is sparse, the philosophical and anecdotal evidence of the correlation is robust. Further research is required to bolster this hypothesis, however, understanding this relationship conceptually is sufficient to inform practice regarding discharge assessment and planning.

2.5.3 Discharge location

As trends towards shorter length of stay within acute care continue, a greater proportion of a patient's recovery journey continues post discharge. Tertiary hospital level care is theoretically reserved for patients during the most acute phase of their treatment. Once this period is complete, patients continue their recovery at home or at another lower acuity care facility (NZNO, 2008). Discharging a patient to a post-acute care facility for ongoing rehabilitation, with the goal of their eventual return home, has been correlated with significant discharge delay (Cai et al., 2020; Ou et al., 2009). Inadequate bed availability as well as long assessment and processing times, have been attributed as potential causes for this delay (Hendy et al., 2012; Alexander Micallef et al., 2020; Roberts et al., 2018). Locating a suitable convalescence or rehabilitation location, as well as arranging for transfer to the location, is time consuming and requires input from many members of the multi-disciplinary team. While this process occurs, the patient must remain in acute care despite no longer having acute needs, ultimately resulting in discharge delay.

The same challenges arise in the process of discharging a patient who has been assessed as requiring long-term rest-home level care and therefore need to be discharged from acute care to a rest-home. Research indicates that most patients who remain in hospital while waiting for a rest-home placement experience short delays attributable to system inefficiencies, while a smaller percentage experience longer delays due to a lack of suitable placement options (Costa et al., 2012). This is a similar problem to that facing patients awaiting post-acute care; an issue of both lack of resource, and system inefficiency.

Patients who are able to be discharged home but require some level of post-acute health care in the form of home help or district nursing, pose another unique set of locational challenges. District nurses are a critical bridge for many patients, they enable patients to be discharged from acute care while continuing to receive necessary care within the community. The scope of district nursing has increased exponentially, with district nurses managing a comprehensive range of assessments and treatments. These include wound management, palliative care, chronic condition management, medication management, rehabilitation, and patient education (MOH, 2011). Unfortunately, barriers remain for patients accessing this vital service. Patients who live closer to district nursing bases may have better access to their services, compared to patients who live in very rural or remote communities (Barrett et al., 2016). In cases where a patient's discharge location is poorly resources by district nursing and other health services, alternative discharge arrangements may need to be made. The patient may need to be discharged to a non-home location such as a family members house, a post-acute facility, or they may need to remain in acute care until the amount of follow up care required is able to be facilitated by the resources surrounding their home environment.

Additionally, patients' proximity to emergency care after discharge may impact on discharge decision making. In some situations, if a patient resides near to a hospital, they can be discharged and instructed to represent if they become unwell, however if a patient is not geographically close to emergency services, this method of discharge becomes inappropriate and patients may need to remain in hospital longer, or be discharged to a location closer to emergency services (Slatyer et al., 2013).

2.4.5 Individual needs versus demographic correlation

Although older age, equity, and location are all correlated with discharge delay, throughout the literature regarding these factors several themes are apparent that may represent a truer cause for the discharge delay associated with them. Older people are not at greater risk of discharge delay simply because of their age, but because of more complex health needs related to age, and an often-brittle social support system. Likewise, difficulties of discharge related to equity and discharge location are associated with challenges of patient condition and lack of support resources.

Therefore, it is not patient demographic factors that delay discharge, but rather the unique physiological and social complexities of individual patients. Although age, equity and location are correlated with discharge delay, attributing delay entirely to these factors is reductive and misses the important nuance of a patient's, and a patient's community's, individuality. If the health care system is to safely and efficiently prevent discharge delay, discharge must be person centred, with care and planning based around the patients individual wholistic needs, rather than isolated demographics.

2.4.6 Healthcare structure and discharge

Equally important to consider are the organisational and structural features which effect discharge. Patient features are difficult to change; however, systems can be modified. By understanding the way in which the health care system itself contributes to discharge delay, interventions based in research can be formulated for system wide improvement.

The issue of discharge sits within a broader context of acute hospital care. Within New Zealand, in-patient acute services are often running above ideal operational capacity. This status of hospital overload is both a symptom and a cause of discharge delay. When workload is saturated and resources are stretched, care must be prioritised to patients who are acutely unwell - these patients are typically new admissions or mid-way through treatment. Length of stay has been shown to significantly increase when hospital capacity is saturated or near saturated (Berry Jaeker & Tucker, 2017) as staff may not have time to allocate to processes required to facilitate a non-acute patient discharge home (Kuluski et al., 2017). For example, a house officer must prioritise assessing a deteriorating patient over filling out a discharge prescription, and an attendant must prioritise taking a patient to an urgent scan over taking a discharging patient to their car. Additionally, staff work with less efficiency in stressful conditions; assessments are less thorough and decisions making is slower (Ardagh, 2015). In practice this means that patients are assessed for discharge more slowly, and the tasks required to discharge them are completed more slowly. In this respect, hospital overload contributes to discharge delay by preventing staff from attending to discharging patients, as well as impacting the quality and efficiency of care they can provide them (Berry Jaeker & Tucker, 2017).

Service availability has also been identified as a contributor to discharge delay. People do not only become unwell during office hours, rather, illness is a 24/7 business. Despite this, hospitals are not run as a completely 24/7 service. Outside of office hours, services and staffing is reduced to cater to the theoretically reduced service use. Reducing services overnight is sensible - services such as surgery or a physiotherapy appointment should not be scheduled for three o'clock in the morning. However, it has been well established that reducing services on weekends and afternoon effects mortality as patients wait longer to access assessment and treatment (Han et al., 2018). Patients whose condition is very acute still progress through the hospital system out of hours. However, for patients whose condition is acute enough that they must remain in hospital, but not acute enough that they require urgent assessment and treatment, capacity is reduced too much to be able to accommodate them and they may have to wait several days to access the resources they require. This reduced access to service, as well as effecting mortality, inevitably effects discharge times (Ardagh et al., 2011; Hendy et al., 2012). As patients are individually delayed, a cumulative delay across the hospital system also occurs. Scans and treatments are requested for patients in the afternoon and over the weekend, but these requests cannot be completed due to service reduction. Once the hospital returns to its usual service level during the work week there is a backlog of patients waiting for these services which need to be seen in addition to the ongoing clinical demand of new admissions (Ardagh, 2015). This produces a cyclical issue where workloads are increased further, discharge ready patients are not prioritised, and discharge delays lengthen.

2.4.7 The healthcare team

The final system related discharge delay contributor is multi-disciplinary-team (MDT) collaboration, or lack thereof. This theme presents itself in various ways across the literature depending on the individual hospital systems studied, however the issue is consistently ultimately attributable to inadequate MDT collaboration whether this is in the form of poor discharge planning, inefficient team meetings, or faulty shared communication tools (Alexander Micallef et al., 2020). Discharge is inherently a multi-disciplinary process. At a minimum it involves the treating doctor and the patients primary nurse, however it often also involves social work, physiotherapy, and

occupational therapy, as well as occasional involvement of other specialities such as speech and language therapy, kaitiaki, and pharmacy. Each of these disciplines recognise slightly different parameters for patient discharge readiness and in collaboration ensure that a patient's holistic needs are considered and met before discharge. To avoid discharge delays, a patient requiring MDT input should, ideally, be seen before the day they are cleared medically fit for discharge. If a referral to MDT is only put through once the patient has been declared medically dischargeable, the likelihood of MDT being able to assess them on that same day is low, and the likelihood of them being able to implement any meaningful intervention that day is lower still. Literature reflects this, consistently attributing MDT delay as a key cause of delayed discharge (Hendy et al., 2012; Ou et al., 2009). Inefficiencies have also been highlighted in MDT communication to the patient and to each other. Research provides examples of inconsistent plans, goals, and advice and unclear or vague communication (McMurray et al., 2007). Role confusion and siloed communication between MDT members further contributes to this delay as work is needlessly repeated by multiple parties attempting to achieve the same goal without effectively consulting each other (Wariyapola et al., 2016). In this way ineffective communication between staff contributes to discharge delay.

Part 2: Potential solutions

2.6 Introduction

Having explored the multi-faceted causes of discharge delay, the question remains; what are the solutions? Solutions to the issue of discharge delay can be approached from two perspectives: interventions that 'push' people out of hospital, and interventions that 'pull' people out of hospital. This research will focus on the former; however, for the purpose of a literature review it is helpful to acknowledge the later for the sake of context.

This section will examine discharge interventions focuses of patients leaving acute care, including discharge planning, criteria-based discharge, short-stay units, ward-round structure, and morning discharge. It will then briefly discuss interventions aimed at increasing movement into the community such as post-acute care.

2.7 Discharge planning

Throughout the literature, many interventions to reduce length of stay and expedite discharge have been trialled, with varying levels of success. Several resources report an intervention being successful in one trial hospital, but unsuccessful in another – this highlights the challenge of developing an intervention that is replicable across all clinical contexts (Coffey et al., 2019). Kreindler further emphasises the danger of "action without knowledge" – developing discharge interventions without properly understanding the issue, demonstrating six trials where interventions had little or no benefit (Kreindler, 2016).

Bearing this in mind, within the literature, several interventions are consistently recommended, the foremost of these being discharge planning. Although the concept of discharging planning is well established, research highlights the benefit of a more formalised, proactive discharge planning process (Carroll & Dowling, 2007), one that is comprehensive, system wide, and policy driven (Wong et al., 2011). A number of elements have been identified as essential facets of discharge planning, these include communication, coordination, education, patient participation, and MDT collaboration (Carroll & Dowling, 2007). Additionally, Yam et al., through a Delphi

Methodology, identified five key practices within the process itself which should be utilised to formulate a discharge framework; initial screening and assessment, planning, coordination of discharge, implementation of discharge, and post discharge follow up (C. H. Yam et al., 2012).

Discharge planning is an abstract concept which is difficult to quantify, thus, although many papers come to similar theoretical conclusions, there is little practical evidence as to how this is best implemented. Ideologically discharge planning makes sense; if a need can be identified prior to discharge, it can be addressed prior to discharge, thus expediting the process. A small group of studies have demonstrated that interventions such as discharge meetings (Wariyapola et al., 2016), a discharge coordinator (Lainscak et al., 2013), and discharge checklist or tools produce positive results. However, systematic reviews of the topic have concluded that there is inadequate evidence that discharge planning produces any positive effect overall (Gonçalves-Bradley et al., 2016; Mistiaen et al., 2007). These opposing ideas can be reconciled by accepting that discharge planning is an inherently patient-centred process, and as such, needs to be implemented differently for different patients in different settings. When a rigorous discharge planning intervention is provided for patients who do not require it, or in a way that does not align with the organisations structure and ethos, inefficiency will be increased (Gonçalves-Bradley et al., 2016; Mabire et al., 2015). However, if patients are screened for factors that are likely to require more discharge planning, then a discharge planning intervention can be applied both promptly and effectively. When a discharge planning intervention is developed for a specific organisation in line with its structure and culture and applied only to patients who require it, it is likely to be effective. However a structured and systematic discharge planning approach such as this remains non-existent in most in-patient settings (Wong et al., 2011).

2.8 Criteria-based discharge

Another frequently discussed intervention to mitigate discharge delay is criteria-based discharge. The terms criteria-based discharge and nurse-led discharge are often used interchangeably, however, they differ slightly. Criteria-based discharge describes the process in which a member of the health care team, usually a nurse, assesses a patient against criteria set by the medical team to determine discharge readiness, after which

they may discharge them without medical review (Lees-Deutsch, 2018; Starship, 2019). In comparison, Nurse-led discharge is the formalisation of a nurse being the primary coordinator of the many facets of discharge and does not typically involve the patient being discharged without medical review, comparable to the formalised discharge planning discussed above (Lees-Deutsch, 2018). For the sake of this discussion, criteria-based discharge is any process in which a patient may be discharged utilising pre-determined criteria without additional sign off by a medical officer. This discharge process has been well established globally in care contexts such as High Dependency Units and Recovery Rooms, where nurses are responsible for discharging patients from these settings to a ward (Jain et al., 2018; Knight, 2003). Recently CBD has been more widely advocated for.

CBD has been successfully trialled for elective and acute operative procedures including laparoscopic general surgical cases (Boden et al., 2021), gynaecological cases, peripheral vascular cases, and breast cases (Graham et al., 2012) as well as in acute medicine (Gotz et al., 2014). Lees and Robinson in their systematic review of the topic demonstrate universally positive outcomes in the implementation of CBD, showing it to improve the nature of the discharge process itself, reduce LOS, and have no adverse impact on patient satisfaction or complications. They also emphasise the importance of a clinically determined set of criteria, appropriate patient selection, and suitable training of staff for the successful and safe implementation of CBD (Lees-Deutsch & Robinson, 2019). CBD has the potential to significantly reduce discharge delay by allowing patients to be discharged whenever they are wholistically ready, rather than waiting to be cleared by the treating medical whose availability is concentrated during office hours (Graham et al., 2012). For CBD to be successful it must be implemented with support of all the parties involved, for example, if the consulting team does not feel confident in the CBD process, they will not allow their patients to be discharged in this manner. Likewise, if the nurses involved in discharge do not feel confident in the process, they will not utilise it and the responsibility for discharge will fall back onto the treating team. Although its implementation often requires an organisational culture change, when applied correctly, CBD has the potential to significantly reduce discharge delay.

2.9 Assessment units

Development of short stay and assessment units are another intervention that appears to improve discharge delay. Short stay, surgical assessment, and medical assessment units all function in slightly different ways but are ultimately set up to accomplish the same purpose. All aim to provide a care context in which patients can be assessed, treated, and either discharged home or progressed to a longer stay ward. These units typically accept patients from GP referrals and / or acute presentations, and have a length of stay target between 24 and 72 hours (Hsee et al., 2012). By diverting appropriate patients to a short-stay/assessment/observation unit, they have earlier access to senior doctor review, diagnostic testing, and treatment which leads to improved patient experience and increased system efficiency (Hannan & El-Masry, 2021). Systematic reviews of assessment and observation units highlight their benefit, demonstrating that they are a safe way to improve patient flow, reduce length of stay, and alleviate ED congestion (Cooke, 2003).

Of all the variation of short stay units, acute surgical units (ASU), which primarily cater to general surgical patients, appear to have had the most success. Within Australasia hospitals are increasingly instigating ASU models and consistently reporting positive outcomes (Gounder et al., 2021; Kinnear et al., 2019; Pepingco et al., 2012). Although in these studies length of stay is typically decreased, little research is available on whether ASU models reduce discharge delay. LOS reduction and discharge delay reduction are related but not identical. Discharge delay may still be occurring within a system that has successfully shortened LOS through other means. ASU models are primarily focused on improving patient flow and efficiency, and have been shown to successfully reduce LOS, however inefficiency may remain within their discharge processes. This may account for the few studies that report no reduction in LOS (Hsee et al., 2012; Pritchard et al., 2017). Further investigation into this element of ASU models may be beneficial.

2.10 Ward rounds

Re-evaluating the structure of ward rounds has also been discussed as a means of improving the discharge process and could potentially be an effective way to reduce discharge delay. Currently, most ward rounds function in a similar manner, the team

responsible for the patients visits them during the morning, conducts an assessment, and develops or modifies the treatment plan. Typically, the rounding team consists of a senior doctor, either the consultant or registrar, and one or more junior doctors. The rounds are often also attended by a Registered Nurse and medical students, and occasionally other members of the MDT (Walton et al., 2016). Once decisions are made on the ward round regarding patient care, the junior doctors complete any required tasks, while the senior doctors move on to surgery or clinic appointments (Myers et al., 2017). This structure means that the tasks required for a team's patient load are often only completed after the ward round is completed, which can be several hours depending on the number of patients admitted under a team. If a patient was cleared for discharge when seen on the morning round, they still may only receive the necessary paperwork to leave the hospital several hours later when the junior doctor has had time to complete the paperwork.

Some research suggests that revising this structure may prevent discharge delay. Ahmad et al. demonstrated that twice daily ward rounds increases discharge numbers and decreases length of stay, while Almond et al. advocates for consultant rounds on weekends to decrease length of stay (Ahmad et al., 2011; Almond et al.). However, Carpenter et al. suggests that rounding in this manner is inefficient, does not improve length of stay and may produce adverse consequences such as decreasing team morale (Carpenter et al., 2019). Additionally, some frameworks have recommend 'one-stop' ward round where all tasks are completed during the round rather than grouping them for completion after the round is completed (Chandel et al., 2015; Team, 2011). However, there is no evidence of this method being trialled in any clinical setting. Although completing elements of discharge documentation during the ward round may reduce discharge delay, more research into this concept is needed.

2.11 Time of discharge

Finally, morning discharge, or before noon discharge, is another concept widely recommended to decrease length of stay and improve patient flow, which may also improve discharge delay. Theoretically, discharging patients before mid-day results in beds becoming available at the same time as demand for admission beds increases, smoothing patient flow throughout the hospital. Simultaneously, by setting a concrete

goal such as before noon discharge, teams are thought to be both more motivated and compelled to discharge patients in a timely manner (Wertheimer et al., 2015). However, throughout the literature concerns arise around the true efficacy of a rigorous morning discharge policy. In one study, Rajkomar et al., demonstrated that morning discharge inadvertently increased length of stay. They attribute this to clinicians waiting till the morning to discharge patients in order to achieve an early morning discharge, ironically delaying patients who could have discharged in the evening (Rajkomar et al., 2016). These findings are supported by a large multi-centre study where morning discharge was not found to be correlated with a decrease in LOS (Kirubarajan et al., 2021). Although Wertheimer was able to demonstrate a nine percent decrease in LOS, others have attributed this reduction to other concurrent interventions such as discharge planning and increased social service involvement (Shine, 2015; Wertheimer et al., 2014). These critiques highlight the argument that perfectly efficient discharge comes about when every patient is discharged home as soon as they are clinically and socially ready, ideally with these two categories occurring in, or near, unison. If a patient is dischargeable in the morning, they should go home in the morning. However, many patients become dischargeable later in the afternoon or early-evening, often after waiting for test results or procedures to be completed (Rachoin et al., 2020). For these patients, enforcing a morning discharge rule inevitably creates discharge delay rather than reducing it. Instead, focusing attention on the barriers preventing patients from discharging at the point they are cleared for discharge, the causes of discharge delay, has the potential to produce more truly efficient interventions and outcomes. In this sense, when assessing discharge efficiency, measuring the amount of discharge delay per patient may be the most appropriate metric

2.12 Transitional care

Regardless of the efficiency of discharge interventions designed to push people out of hospital, if post-discharge care is inadequate, patients will not be able to leave hospital. Push interventions must be mirrored by pull interventions – resources and programmes that facilitate peoples return into the community. As discussed, an ageing population combined with pressures to decrease length of stay, requires that post-acute care of varying degrees must be sufficient to cater to the needs of patients

discharging from hospital (A. Micallef et al., 2020). Many patients are not able to discharge immediately, or ever, to their homes. These patients cannot remain perpetually in acute care settings as they no longer require acute care. Instead, rest homes, rehabilitation, convalescent care facilities and other non-acute care settings must be able to efficiently draw people out of acute care and into their services as soon as is appropriate. Research consistently attributes both inadequate post-discharge care availability, and inefficient transfer processes as major causes of discharge delay (Costa et al., 2012; Hendy et al., 2012). Therefore, the expansion of non-acute care services, and streamlining of referrals and transfers to them has the potential to significantly decrease discharge delay.

Post-acute care facilities such as convalescent care, transitional care and intermediate care all aim to provide care closer to the patient's home, facilitate early discharge, and avoid readmission to acute care. These have been successfully demonstrated to achieve these goals, bridging the gap between the need for acute care and the ability to return home (Sezgin et al., 2020). Additionally, home based rehabilitation has been trialled with excellent patient outcomes, demonstrating that appropriate patients can be safely discharged from acute care to at-home-rehabilitation programmes (Cook et al., 2013; Rasmussen et al., 2016). Bolstering these services allows for patients who no longer require acute care, but are yet unable to return home independently, to promptly transition into an appropriate facility or programme. This improves outcomes for patients while also decreasing discharge delay.

As Costa et al. highlights, bed availability is not the only cause of discharge delay in these instances, rather, convoluted referral and assessment process are equally often implicated (Costa et al., 2012). This appears to be a particular issue when discharging patients who previously lived in their own homes to rest-home type facilities. However, improving the assessment and placement locating process decreases discharge delay by providing a clear pathway for staff to utilise (King et al., 2018; King et al., 2013).

2.13 Research underpinning the study

Although the body of research surrounding discharge efficiency is broad, within this abundance exists a smaller subset of research addressing the cause of discharge delay was of particular relevance to this inquiry.

Research has been carried out across many different specialties exploring the origins of discharge delay. Hendy et al., identified the specific causes for discharge delay in their patient cohort through analysis of patient records and daily staff interviews (Hendy et al., 2012). This produced a robust understanding of the cumulative causes of delayed discharge across a patient's entire admission. Alternative research has explored discharge delay from different perspectives, with some literature focusing on patient characteristics as causes (Kennedy & Numa, 2020; Landeiro et al., 2016; Ou et al., 2009), others on the downstream causes of discharge delay (A. Micallef et al., 2020; Roberts et al., 2018; Rosman et al., 2015) and still others on the structural causes of delay (Ardagh, 2015; Berry Jaeker & Tucker, 2017).

Although this research contributes to the understanding of the causes of inefficient discharge and unnecessarily long length of stay, it does not survey the cause of discharge delay from the point in time when the patient is medically dischargeable. As discussed, a patient must be both medical clear and socially fit to discharge home. In an optimised system these two categories would coincide so that most patients are ready for discharge at the moment they are medically cleared. Little research exists on the period between when the patient is medically discharged and the time that they physically vacate acute care. This highlights a gap in the research, identifying a need to identify the causes of discharge delay after the patient is medically cleared for discharge.

2.14 Literature review summary

The topic of discharge delay is broad and multi-faceted, as is the research surrounding it. This literature review outlined the importance of quality patient discharge, and the impacts on both the health system and the patient when discharge is not completely efficiently or safely. From this foundation, the various causes of discharge delay were explored. These included older age, equity, discharge location, the health care

structure, and the health care team. After discussing the many potential causes for discharge delay, potential solutions and interventions were considered, including discharge planning, CLD and NLD, assessment units, the ward round structure, the time of discharge, and transitional care. Although the body of research surveyed highlights important features relating to discharge delay across the entire patient journey, an evident gap exists – little research has focused specifically on the discharge time period after the patient has been medically cleared. This study aims to fill this research gap by understanding the features that cause discharge delay after a patient has been medically cleared, and by exploring how this delay can be minimised.

2.15 Research aims and questions

This study aims to understand the causes of discharge delay in acute care patients being discharged from the acute surgical unit, focusing specifically on the time period between medical clearance and the patient leaving the ward. This knowledge will assist policy development to improve the efficiency and quality of the discharge process, improving outcomes for both the hospital system and patient. This study will answer the following questions:

1. What are the features that cause discharge delay in an acute surgical assessment unit
2. What is the impact of discharge delays in an acute surgical unit
3. How can discharge delays be minimised in an acute surgical unit

Chapter III: Methodology

Research is formalised curiosity. It is poking and prying with a purpose.

Zora Neale Hurston, 1903 – 1996

3.1 Introduction

Methodology is the theoretical rationale behind the selection of research methods and informs the development of research questions and how conclusions are drawn (Nayak, 2015; Plano Clark, 2016). Methodological applications vary across disciplines and is decided upon based on the nature of the research being undertaken (Bergman, 2008). This chapter will discuss the two tenants of methodology: approach and paradigm, as well as discuss their application to the research methods described in the following chapter. The chapter initially considers the paradigm in which the research is located within, then discusses quantitative, qualitative and mixed methods research in relation to the study itself.

3.2 Research paradigms

A paradigm is the lens through which the world is understood. In essence, a research paradigm is the framework of philosophical assumptions which underpins research (Blaikie & Priest, 2017; Pabel et al., 2021). All research operates through a paradigm as it generates, analyses and forms conclusions regarding data based on ontological and epistemological presuppositions. This set of assumptions influences every stage of research, regardless of whether the paradigm is explicitly stated or not. The choice of paradigm is determined by the nature of the research being conducted and the research questions being asked.

Research paradigms can be divided into two main classifications; positivist and post-positivist. Historically, positivist research paradigms dominated research, echoing the dominant social philosophies of the time, modernism. Modernism asserts that truth is objective and un-nuanced. This translates into a research paradigm that reflects this belief, with positivism operating from the premise that an absolute truth can be discovered through a pragmatic approach (Rehman & Alharthi, 2016). As such,

positivist paradigms focus on scientific testing, measurement, and objective observation, thus lending itself to quantitative approaches (Park et al., 2020).

Neo-positivism is similar; however, it differs from positivism in that it perceives truth as tentative. Neo-positivism asserts that although science can establish truth it can never establish a truth as absolute; rather it is limited to critically tested theories (Blaikie & Priest, 2017). For this reason, positivist and neo-positivist methodologies are fundamental to quantitative research, however, they are less applicable to qualitative research where alternative paradigms are often more appropriate.

An interpretivist paradigm is frequently utilised in areas of social science, contrasting with positivism by asserting that social reality is produced and defined by society itself. Interpretivism is concerned with the subjective experiences of individuals within a system, their perceptions of themselves and their world, and the meaning they attribute to their own experiences. It aims to establish an objective meaning from subjective experiences by interpreting the emotion and motive behind data, rather than simply isolating a causal relationship within the data (Blaikie & Priest, 2017; Darby et al., 2019). In essence, it seeks to establish the 'why' of an observed phenomena.

The critical analysis paradigm is often compared to the interpretivist paradigm, as both contrast with positivism by embracing subjectivity. Like interpretivism, critical analysis asserts that although pattern observation is an established starting point for scientific investigation, it may not be able to identify the causes and phenomena taking place to produce these patterns. Critical analysis differs from interpretivism however, in that its principle focus is power, inequality and social change; operating from the philosophical standpoint that science should seek to exact social improvement (Blaikie & Priest, 2017). Both interpretivism and critical methods are applied most appropriately to qualitative data where meaning can be interpreted from the observed non-numerical data.

Although such paradigms are often seen as conflicting and unreconcilable, in research where the aim is to utilise numerical data to improve a system, combining paradigmatic approaches yields meaningful and useful results. As a result, dialectical approaches are

often favoured in areas such as health care where both objective data and subjective experience are of equal significance. By employing dual methodologies, as utilised in this research, trends and relationships can be identified and then made relevant by exploring the underlying influences directing them. This combination of paradigms is commonly called mixed methods, which employs the use of both quantitative and qualitative research and the paradigms associated with each.

3.3 Quantitative research

Quantitative research encompasses a range of investigation methods involving statistical or numerical data. Fundamentally, quantitative research assumes that its research subject is measurable and sets out to collate and analyse data, identifying trends and relationships, and testing hypotheses. This process is deductive and is typically informed by the positivist paradigm (Park et al., 2020; Watson, 2015).

A quantitative approach commonly utilises either an experimental, quasi-experimental, or non-experimental design (Rutberg & Bouikidis, 2018). Experimental designs involve the researcher manipulating an independent variable and observing its effect on a dependent variable within randomised groups, one example of this is the randomised control trial which is considered by many as the gold standard of quantitative research (Watson, 2015). The randomised controlled trial includes the features of manipulation, randomisation and control and is considered an experimental design. Quasi-experimental designs are similar; however, they are missing one or more of these three features (Maciejewski, 2020). Due to the nature of health care research, assigning participants into randomised groups is often neither ethical or practical, therefore the quasi-experimental design is often utilised within this area of research, one example of this is the pre- and post-intervention model (Harris et al., 2006; Sousa et al., 2007). In comparison to experimental based approaches, non-experimental design are missing all three features and rather seek to explore relationships through observation (Sousa et al., 2007). These are often surveys in the form of cohort studies, trend studies or panel studies (Watson, 2015). This study will utilise a non-experimental design in the form of an audit for its quantitative data collection.

3.4 Qualitative research

A qualitative approach to research is usually grounded in post-positivist paradigms such as interpretivism or criticism; however, it can be utilised effectively within a positivist framework. Unlike quantitative research, qualitative approaches handles non numerical information and phenomenological interpretation (Leung, 2015). Qualitative research explores subjective human experience within its social context, seeking to understand the factors influencing these experiences. This approach is valuable in research in relation to nursing as it provides an effective way of understanding patient experience and behaviour and produces research that focuses of person-centred care (Gelling, 2015). A qualitative approach to research takes a subjective stance, asserting that there are various perspectives on reality, and that the socio-cultural context of research effects the researcher and their findings. As a result, the researcher unavoidably becomes part of the research as they interact with and interpret the data (Dodgson, 2017). Although such intimate involvement of researcher and subject increases the risk of research bias, sufficient methodological transparency and rigor mitigates this risk (Leung, 2015).

Qualitative data are typically produced through interviews, focus groups or descriptive observation. As such, the data analysis process used in this approach differs from that employed by quantitative data. Although there are many commonly used qualitative analysis methodologies, perhaps the most simple yet effective analysis method is the general inductive approach, the approach utilised in this research. A general inducive approach seeks to condense raw text data into a summary format, establish clear defensible and justifiable links between this summary and the research objectives, and develop a theory or model based on these findings (Thomas, 2003). Drawing from an interpretivist paradigm, this method of analysis allows themes to be systematically identified from large quantities of text data, such as interview transcripts, and formed into a theory or framework. Due to the nature of this interpretation, care must be taken to avoid imposing preconceived conclusions onto the data, and to instead carefully analyse the true themes that emerge organically from the texts (Thomas, 2003).

The qualitative data utilised in this research will be gathered through interviews. Interviews are the most common form of qualitative data collection and can be carried out with varying levels of structure, and various numbers of participants (Jamshed, 2014). This methodology typically consists of a recorded dialogue between researcher and participant, allowing the researcher to gather in-depth data about the participants experiences, thoughts and feelings surrounding a given topic (Dejonckheere & Vaughn, 2019). Semi-structured interviews, as will be utilised in this research, are frequently used within health care contexts. This form of interviewing facilitates participants answering open-ended questions guided by a predetermined interview schedule. These interviews are often conducted once only, typically last between 30 minutes to an hour, and allow for flexibility in questioning with the researcher having the ability to add questions and explore a line of thought not explicitly covered in the schedule (Busetto et al., 2020). In this sense, qualitative semi-structured interviews have the advantage of being interactive, potentially avoiding the research bias that may occur in written surveys which are only able to measure predetermined phenomena expected to be of relevance (Busetto et al., 2020). Despite this, researchers conducing semi-structured interviews must take into account the potential weakness of this means of data collection, by taking caution to avoid leading questions, providing a private interview environment, and avoiding power imbalances between the people involved (Dejonckheere & Vaughn, 2019; Kallio et al., 2016). If such challenges are considered and avoided, semi-structured interviews are able to provide robust and meaningful data.

3.5 Mixed methods

Mixed methods can be simply described as the integration of both quantitative and qualitative methodologies. Drawing from the strengths of both approaches, mixed methods is a popular methodology in health care research. It recognises both the importance of objective observation, and of personal subjective experience, and is therefore able to demonstrate not only that a relationship or phenomena exists, but why and how it exists withing its context (Östlund et al., 2011; Palinkas et al., 2019). Although such integration has been argued against based on the paradigmatic and ontological differences in quantitative and qualitative approaches, mixed methods is now widely accepted as an appropriate approach for many areas of research (Östlund

et al., 2011). The approaches involved in mixed methods may be given equal weight, or one may be used to compliment the other more dominant approach. These two approaches may be used together to achieve a variety of research goals such as triangulation, transformation, complementarity, sampling, explanation, or development. Within this research, mixed methods will be utilised to achieve development, a process in which one method is used to develop concepts or interventions that enable the use of the other method to answer other questions and guide further research (Palinkas et al., 2019). In this instance, the qualitative data will be collected first, which will then inform the quantitative phase, strengthening and giving meaning to the overall conclusions.

3.6 Researcher background

The researcher completed their undergraduate study at Waikato Institute of Technology. After graduating in 2019, they entered a new-graduate position in an acute surgical assessment and short stay unit at Waikato Hospital, after which they moved into post anaesthetic care. Now in their third year of practice, the researcher plans to continue practicing at Waikato Hospital and is passionate about improving nursing practice and patient experience, especially within surgical contexts.

Chapter IV: Methods

Creativity requires input, and that's what research is. You're gathering material with which to build

Gene Luen Yang

4.1 Introduction

This chapter outlines the specific approach undertaken in this mixed methods study, outlining the process by which the research was carried out. The study design will be outlined, with both phases explained, and the population will be described. Following this, the process of data collection and analysis will be related with ethical concerns accounted for.

4.2 Study design

The following research's study design is mixed methods, as described in chapter three. Mixed methods combines both qualitative and quantitative methodologies to employ the benefits of both approaches. In order to combine the two differing methods, this research was carried out in two phases. The first phase is based on qualitative methodology, exploring the research question through interviews, while the second phase is quantitative, measuring the causes and extent of discharge delay. In this manner the two methodologies will complement each other, increasing the depth and breadth of understanding of discharge delay.

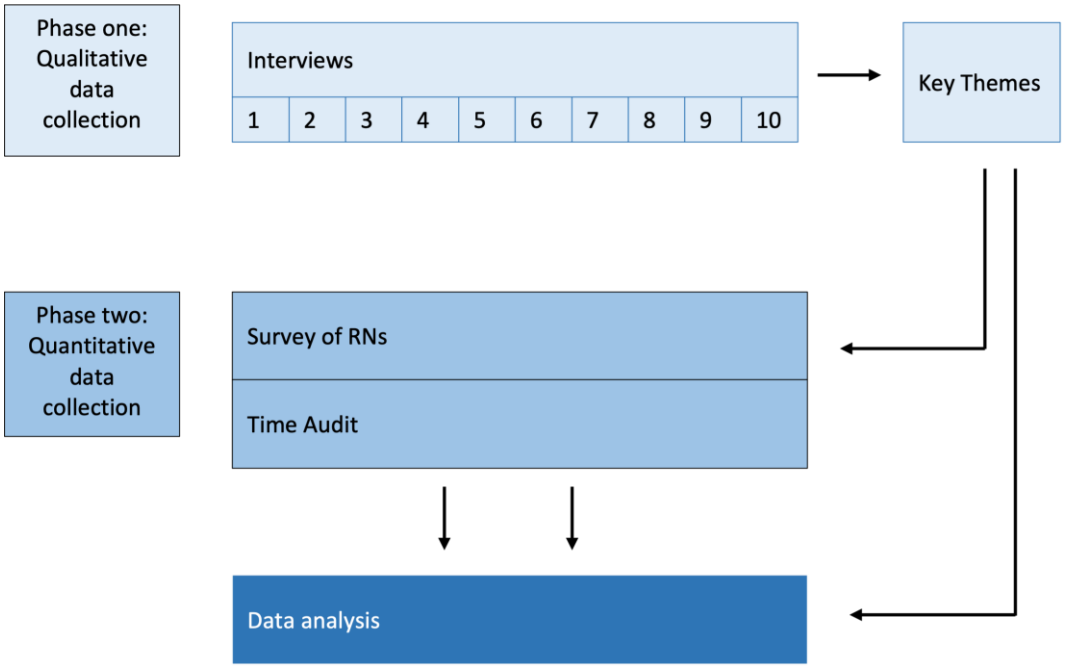

Figure 1: Study design

4.2.1 Phase one

Phase one involved the gathering of qualitative data through a series of semi-structured interviews with relevant staff. The purpose of the interviews in phase one was to ascertain the opinions of staff on the discharge process and on what they believe could be improved on, as well as garnering understanding of the discharge process broadly and the way different roles engage with patient discharge.

These interviews involved nine participants: senior Registered nurse (n=1), Associate charge nurse manager (n=1), Charge nurse manager (n=1), Senior operational manager (n=1), executive nursing manager (n=1), General surgical fellow (n=1), General surgical registrar (n=1), General surgical house officer (n=1), and MDT member (physiotherapy)(n=1). The interviews were conducted primarily with individual participants; however, one interview was carried out as a small group where the staff members roles relating to discharge were deemed similar, this were the associate charge nurse manager and the senior registered nurse. All interviews were conducted in a quiet, private location, with participants assured of the anonymity of their contributions. The interviews lasted for approximately an hour and were semi-

structured, guided by a consistent interview schedule but with the ability to deviate from the schedule and explore participants thoughts and ideas organically. These interviews were recorded and transcribed using transcription software, after which the researcher manually checked the transitions and amended any transcription errors. The evidence gathered in this manner was then able to be analysed using general inductive inquiry

4.2.2 Phase two

Phase two involved quantitative data collected through two concurrent methods, an audit and surveys. An audit of all patients discharging from the acute surgical unit was carried out over 14 days. The time at which a patient was deemed 'Ready for discharge' or for 'Discharge planning' on the ward round or medical review was recorded, then the time at which the patient left the ward was recorded. The length of time between these two times was recorded as the patients discharge delay, these times were collated, and average discharge delay was calculated for the 14 day period. After the patient discharged, the registered nurse responsible for the patient was asked to fill out a survey regarding the events that had taken place during this time period (See: Appendix 3 and 4). This survey was in the form of a tick box form, where the nurse could select any number of events that had applied to patient discharge in question. These options were developed from the themes identified in the qualitative interviews in phase one. There was also a further option where the nurse could add any other causes of discharge delay that were not identified within the existing survey options. Within the form definitions were provided for each survey option in order to support the nurses in selecting the most appropriate events. The surveys were placed into a sealed box in the nurse's office after completion by the nurse. The categories selected were then analysed to determine the most significant causes of discharge delay.

4.3 Population

4.3.1 Sampling framework

Phase one of the data collection process involved a series of interviews. The researcher approached relevant staff members, and after they had verbally agreed, arranged a time to undertake the consenting process and the interview. At this meeting the information sheet and consent form were supplied.

Phase two of the research was carried out over two weeks. During this period, all Registered Nurses who were primarily responsible for patients discharged during this phase were supported to complete an audit detailing the journey of the patient they were responsible for from the time they were cleared for discharge to the time they left the ward. Simultaneously, an audit was carried out where times were recorded for every patient discharging from the ward, these were recorded at the point they were cleared for discharge, and the time they left the ward.

4.3.2 Setting

The research took place at Te Whatu Ora Waikato (formerly Waikato District Health Board) in the Acute Surgical Unit, based at the Waikato-Waiora campus in Hamilton. Phase one was undertaken during October and November 2021, and phase two was undertaken during February 2022.

4.4 Data collection

The process of data collection was undertaken in two phases with phase one establishing themes through interviews regarding the perceptions of causes of discharge delay held by members of the health care team. Phase two build on the data collected in phase one by quantifying the length of discharge delay occurring for patients discharging from the acute surgical unit and establishing the reasons for the delay. In this sense, a mixed methods approach was utilised in the data collection.

4.5 Analysis

The mixed methods employed in this study invoked the strengths of both qualitative and quantitative data. The combination of methodology's provides a robust and nuanced interpretation of data. The analysis of this data was undertaken in a manner consistent with the study design. A general inductive analysis was applied to the first phase of data collection, extracting themes from the qualitative data. Statistical analysis was applied to the second phase of data collection, identifying averages and frequency's from the quantitative data.

4.5.1 Phase one

The general inductive approach utilised in the analysis of the qualitative data provided a systematic means of interpreting the data. After the interviews were transcribed, they were read thoroughly several times, with a code attributed to each idea and 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, suitable for laying the foundation for the data collected and analysed in phase two. These themes provided the context for the development of the audit form used in phase two.

4.5.1 Phase two

The analysis of the data collected in phase two utilised two approaches. The discharge delay times were recorded, and statistical analysis applied. The times were totalled to understand the net amount of discharge delay that had occurred within the population over the audit period. The mean delay was then calculated based on this total. Following this, the causes of discharge delay selected by participants 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 clearly understood. Due to the study design, with participants able to select multiple causes of discharge delay that applied to their patient, it was unfortunately not possible to calculate the amount of discharge delay attributed to each cause.

4.6 Ethical concerns

This research took place by researchers from the University of Waikato, with support from Te Whatu Ora Waikato (formerly WDHB). All data was collected from Waikato Hospitals Acute Surgical Unit, the place of employment of the researcher. This study gained approval from the University of Waikato Human Research Ethics Committee on the 27th of May 2021 (Approval number 2021#31; See: Appendix 1). Approval was also given by Te Whatu Ora - Waikato and specific clinical directors (See: Appendix 2). Prior to the interviews all participants were given an information sheet and consent

form containing comprehensive information regarding the study. Consent forms were signed and retained by the researcher's supervisor.

Prior to beginning phase two, an email was sent out to all Registered Nurses who would potentially be working on the ward during the time of the research and thus potentially participating in the survey. This email outlined the purpose of the research and provided ability of staff to ask questions of the researcher or to opt out of participation. For those completing the discharge surveys, participants were informed that by completing and submitting the survey, they were providing consent. All participants in both phases were assured of confidentiality, and informed that they could withdraw from the study at any point without consequence.

Although the audit took place at the place of employment of the researcher, bias and influence was avoided as much as possible by the researcher not completing audit forms themselves, and by supporting their colleagues to complete to forms based on their own interpretation of the causes of discharge delay.

4.7 Methods summary

In conclusion, the mixed methods approach allowed for the effective combination of both qualitative and quantitative data. Phase one involved the collection of qualitative data through ten interviews with various members of the health care team, which was then analysed through a general inductive approach. The understandings derived from phase one informed the data collection in phase two, which involved the collection of quantitative data through an audit.

Chapter V: Findings

> *It's clear to me that different things work for different people and there is an obligation on the part of those of us with the power to do so, to instigate change.*
>
> Irihapeti Ramsden, 1998

5.1 Introduction

Qualitative data collection and analysis employs a systematic approach to answer questions concerning subjective experiences and observations. This process consolidates data and explores the themes and trends within it in order to understand the 'why' of a situation (Seers, 2012). Quantitative data, in contrast, is numerical and quantifiable, analysing objective observable trends and relationships. In this study both qualitative and quantitative data were analysed to produce synergistic answers to the research questions.

The chapter is organised around two parts, the first addressing the findings emerging from the qualitative analysis, and the second describing the quantitative analysis. The qualitative section will discuss the population interviewed, the process through with the data was analysed, and the three themes generated through the data analysis. The quantitative section will describe the sample, the factors that occurred within the sample, and discuss the impact of the amount of discharge delay that occurred across the sample.

Part 1: Qualitative findings

5.2 The population

A total of nine interviews with members of the health care team were conducted. These included a charge nurse manager, a senior operational manager, an executive nursing manager, an associate charge nurse manager, a senior surgical registered nurse, a house officer, a junior registrar, a surgical fellow, and a physiotherapist. 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 the following table.

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

5.3 Thematic analysis

The interviews were all semi-structured in nature, allowing the researcher to guide the interview in order to maintain relevance to the research topic, without restricting the

participant's ideas or recollection of experiences. The interview process allowed a wide range of topics relevant to discharge delay to be explored through the eyes of all the parties involved in discharge. It also allowed for topics and themes to emerge which had not been explored in the literature review, but that were pertinent to the topic and had been experienced first-hand by the interview participants. 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.

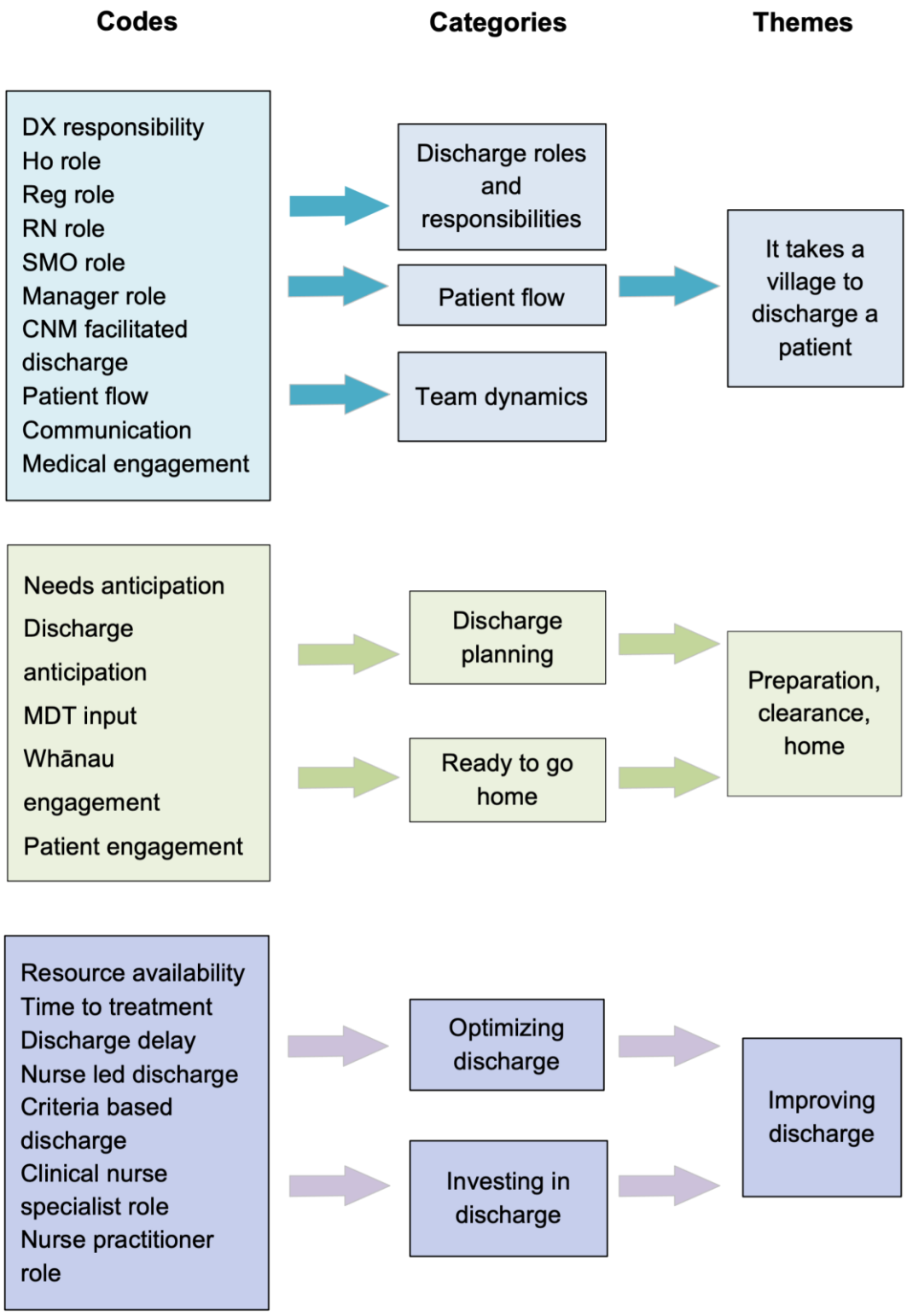

Figure 2: Thematic analysis

5.3.1 Theme 1 – It takes a village to discharge a patient

The first theme was composed of three categories: discharge roles and responsibilities, patient flow, and team dynamics. In turn, these categories were composed of ten original codes: discharge responsibility (13 codes), house officer role (57 codes), registrar role (20 codes), consultant role (3 codes), registered nurse role (57 codes), hospital manager role (three codes), charge nurse manager role (five codes), patient flow (51 codes), communication, (118 codes) and medical engagement (four codes).

This theme explores the many different staff member roles involved in patient discharge, and the dynamics that exist between the people who fill these rolls. The conversation and quotes explored the ways each participant believed they contributed to patient discharge, as well as the ways in which they perceived other health care professionals' roles contributed, and who they viewed as responsible for each stage of the discharge process. A clear distinction of roles and processes emerged, with participants in agreement around the ways in which these the varying roles interact to facilitate patient discharge. Parties agreed that the consultant has overall responsibilities for the patient and their discharge criteria.

> *"So the consultant has overall responsibility for the patient. So I guess it's sort of like the key decision maker for discharge, or for predicting, planning for discharge, and then maybe the features that would make the patient okay for discharge,*
>
> Surgical fellow

The registrar was described as managing the ward round and making discharge decisions on the consultants' behalf.

> *"Registrar has the day-on-day responsibility of doing the ward round and catching up with house surgeons and making sure the job's done and they can make simple decisions for discharge, like appendixes and stuff like that."*
>
> Surgical fellow

House officers were described as managing the practicalities of discharge by ensuring the medical tasks required to discharge the patient were complete, such as the discharge paperwork and follow up.

> *"And then the house surgeon has the actual responsibility for doing the paperwork to get the patient out."*
>
> Surgical fellow

> *"…discharging is done by the House officers in terms of the paperwork side of things… it's our job to make sure that we've checked off all the bloods for that patient, the (observations) are stable. All the loose ends to be tied up and then we can discharge the patient from the computer and print off the script"*
>
> Surgical House officer

Within this discharge process, participants highlighted that the discharge decisions are made collaboratively, with input from both nursing and MDT services.

> *"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 multidisciplinary team 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

Nurses were described as responsible for facilitating safe patient discharge by ensuring all their needs were met prior to discharge such as education, transport, accommodation, and clinical discharge readiness. Participants also emphasised their role in progressing discharge by following up with house officers about test results and other discharge requirements.

> *"Also, the nursing staff help facilitate (discharge), there might be something we wait on for discharge for one of our patient's… needs blood tests and if that's better, they'll be able to go home, so the nurses can often help with chasing house surgeons, and making sure bloods are done and that sort of thing."*
>
> Surgical fellow

> *"Often, the nurses have everything planned and ready, like the IV line is already out, they've already packed the bags and like, you know, everything's done."*
>
> Surgical House officer

The charge nurse reflected that, although proactive nurses progressing discharge is a good thing, it would be better if this proactivity was supported by an underlying robust system.

> *"On one hand, nurses are really being proactive in their care for the patient and are really driving the discharge. But if they weren't driving that discharge, would it happen so efficiently and quickly? And so it's reliant on that, rather than a robust process, it relies on this nurse who either has the knowledge and the confidence and the experience."*
>
> Charge nurse manager

Another concept that emerged within the qualitative data was the prioritisation of discharge by the different parties involved in discharge. This quote captures the competing priorities between admissions and discharges, and the challenge this poses to patient flow.

> *"Sometimes they don't have the time because they're focusing on the people that are coming in the front door or that are staying. Discharging patients have low priority, but they're not really low priority in the scheme of it because we can't get the ones that are coming through the front door in unless we get those discharges out right? It so, so hard. It's our daily battle."*
>
> Charge nurse manager

Nurses consistently attributed discharge delay to the low prioritisation of discharge by house officers due to their high workload.

> *"The doctors, I think they have quite a big workload and they have got a lot of priorities and different things, I think. To us we see the discharge as quite a priority, but to them, they may have the patient sick in HDU… something more urgent."*
>
> Associate charge nurse

As well as attributing it to workload, one nurse also ascribed the low priority of discharge to house officers' lack of focus on patient flow and overall hospital status.

> *"It's the workload of house officers, that really lets discharge down, because it's not a priority to get somebody out. And also I think the tunnel vision sometimes from house officers. They don't understand the overall flow of the hospital and what a bed means especially when the hospital is in a generalized crisis, or the bed capacity is very very high".*
>
> Senior registered nurse

The house officer confirmed that discharge is of lowest priority due to the precedence of more time critical tasks.

> *"Often we need to get our CT scan requests, our cardiology consults or extra stuff done before lunchtime, or even before 2pm so that we actually get a plan before four and so our discharges are our lowest priority. And they are done after 3pm and we are just*

> *really keen to go home by that point. 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 three o'clock because it won't be done (that day)".*
>
> Surgical house officer

The two registrars also acknowledged this, conceding that house officers cannot prioritise discharge when the workload is too high.

> *"And unfortunately, when it comes to job load, some of the more important things are getting scans requested the theatre requests, getting other specialties input and stuff…*
>
> Junior registrar

> *"… or when house surgeons actually are just really, really busy. Just can't get round to paperwork".*
>
> Surgical fellow

However, the registrars reflected on their own experiences as house officers and commented that house officers increase in their ability to prioritise discharge when they are more experienced.

> *And I think, especially with the junior staff, like I had this issue when I first started off, what's important to prioritize? It's quite difficult. I think especially when you first start, you have to adapt to everything. But I can see where that holds up discharges"*
>
> Junior registrar

> *"Just the lack of efficiency, even with staff you know, house surgeons don't necessarily need to write the long discharge summaries"*
>
> Surgical fellow

A similar sentiment was echoed from nursing staff regarding junior nurses, noting that junior nurses require more support to discharge patients confidently, safely, and efficiently.

> *"Might have been planning for discharge for days and then suddenly on the morning of the discharge you say to the nurse "have you done such and such?" and they say "oh, no" and then suddenly it's delayed."*
>
> Charge nurse manager

> *"It's experience I think, so you're more aware of things and you've had to do more complicated things, whereas if you're new to surgery or to the ward then it takes a while"*
>
> Associate charge nurse manager

One participant also stated that he felt that nurses may not progress the discharge process as quickly as they could, because a discharging patient means an inevitable new admission, which results in a significant task burden added to a workload which is potentially already saturated.

> *"I may be controversial, but…It's easier to have the patients that you started with and keep them for the day than actually have that turnover… I certainly know there is hesitation in getting patients out because that will certainly increase your workload….*
>
> *The coordinator trying to support their staff as well. If you've got four admissions coming in at once, that's an enormous amount of workload…and if you're running short, or you've got a high acuity ward, having a couple of empty beds, not declared for a period of time actually does give staff a bit of a reprieve"*
>
> Executive nursing manager

This reflects the literature described in chapter two. When hospital acuity is high and workloads are high, care must be prioritised to patients who are acutely unwell, rather than patients who are medically stable (Berry Jaeker & Tucker, 2017). This is safe prioritisation. When workloads are lessened, either by increasing staff or decreasing acuity, less time sensitive tasks, such as discharge, can be prioritised (Kuluski et al., 2017). Although the lack of prioritisation of discharge can be attributed in part to staff inexperience, a greater degree is attributable to workload saturation.

A further category that emerged within this theme was communication and team dynamics between the parties involved in patient discharge. As established in the literature review, clear communication between health care providers and to patients is essential for quality discharge (Wariyapola et al., 2016). Within the participant interviews this concept of communication came up repeatedly in relation to a range of scenarios, highlighting the pertinence of it to the overall theme of the people involved in discharge. An excellent team of health care providers cannot facilitate quality discharge without quality communication.

The participants interviewed consistently recognised the importance of communication, and expressed that communication was open and constructive between members of the health care team. This quote by a junior registrar demonstrates the freedom of communication between registrars, house officers, and nurses, and the ability for all parties to raise concerns with one another.

> *"I think (communication is) good because we make a decision, and everyone, hopefully, is on board. but the good thing is I've noticed that when people aren't on board they'll vocalise and say their concerns, so hopefully I'm approachable enough. Because I have house surgeons ask, "have we thought about this" and I'm like, "let's do that". The nurses are usually good because they attend ward rounds with us and they give us the like, "this is what's been happening" and "they're actually not telling us this" and stuff like that."*
>
> Junior registrar

All nurses interviewed also agreed that within the general surgical speciality communication between doctors and nurses is generally good and attributed this to trusting and respectful working relationships.

> *"We're quite lucky with our doctors, there are some other areas that are very dictatorial. I think it's more a partnership up here, working together."*
>
> Associate charge nurse

> *"I think the good thing is our consultants are more up for the conversation and they're not necessarily like stuck in their ways like, "do this this this". They will probably be like "oh yeah, that could work. What do you think?""*
>
> Senior registered nurse

Within the broader Multi-Disciplinary Team (MDT), communication was also described positively with MDT described as accessible, and their plans described as being well received.

> *"So everyone's usually pretty on board as long as the plan is sound, and there's good clinical reasoning"*
>
> Physiotherapist

> *"If you've got a house surgeon that's good at communicating with MDT, looking at notes and things it can also work well because it's mostly how we would interact with social work and physio"*
>
> Surgical fellow

> *"I think we're very lucky up here with support systems and social workers are efficient and coming up now and the physios and OTs are always available quite quickly"*
>
> *Associate charge nurse.*

While the spirit of communication between health care providers was described positively, the modes of communication did fall under some criticism. Several participants described registrars and consultants as difficult to reach after the morning round due to their operating theatre responsibilities – if a surgeon is in theatre, they cannot easily answer a phone call or return a text message. This was highlighted as a major issue for discharge, as many patients are seen on the morning ward round and cleared for discharge pending medical imaging, or a final set of blood tests. When these results return, the house officer must first confirm with their senior before discharging the patient. This quote from a house officer describes this issue well.

> *"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 often 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 3:30, 4 o'clock, which means that there's patients' 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

The same challenge was described as occurring with more complicated discharges, where the junior registrars may require input from their seniors to discharge a patient.

> *"The communication between the doctor team can I think be difficult sometimes between the junior and senior staff. Mostly because the junior reg wants to know if someone's okay to go home, if the consultants are off site or doing a private list or something, that delays things, or like if the senior reg is operating and I've got somewhere else to be, you don't get to catch up till later"*
>
> Surgical fellow

Additionally, participant expressed frustration with the way house officers are contacted by nurses. During office hours, Waikato Hospital utilises a pager system for nurses to contact house officers, with the pager numbers listed on an online roster. One nurse explained that pagers were challenging because the nurse cannot tell whether the page has been received.

> *"You never know whether they've got it or not, and you don't want to just keep paging them, or hassling them, and they don't often reply. "*
>
> Associate charge nurse

She explained that it is important that a nurse can receive a reply from the house officer communicating their response and/or timeframe as this information is critical to the RNs decision making. If a house officer could more easily send a reply, then the RN has more information to inform their plan of care.

> *"You're going to (contact) somebody that's got a mobile phone because you can actually talk to them, they can say "I'm sorry, I'm busy for the next two hours I can't come in", then you know"*
>
> Associate charge nurse

The Junior registrar explained that although house officers are supposed to call back after receiving a page, not all house officers do, or are able to. Additionally, nurses do not have time to wait for the return phone call, especially when they don't know whether the house officer is in fact going to call them back.

> *"There's got to be a better way than pagers. Pagers are the worst. When I was a house surgeon, I'd call directly back, but not everyone does that. And nurses have to go off and do stuff, so it'd be better if they had a different system."*
>
> Junior registrar

For these reasons, the junior registrar described the pager system as dangerous, and said that she refers to be contacted by phone or text.

> *"I hate the pager system, it's horrible system. I would prefer, I don't know about house surgeons, but I prefer a phone call or a text message. I think pager systems are dangerous."*
>
> Junior registrar

Communication within the nursing component of discharge was also described as lacking. Nurses described discharge planning as challenging because the tasks required for it must be handed over from nurse to nurse, and this communication is dependent largely on verbal handovers.

> *"I don't think we talk about discharge enough on handovers. So maybe we need to make it part of our handover. We sort of do it for procedures, we hand over well 'oh*

> *this patient's going for ERCP tomorrow'. Then we have checklists. But not for discharge."*
>
> Charge nurse manager

With patients being cared for by different nurses every day, discharge planning becomes disjoined and inefficient as its often complicated progression must be communicated every eight hours in a verbal handover. Improving discharge related communication in this area could increase the processes efficiency.

In conclusion, the theme 'it takes a village to discharge a patient' explored the varied staff roles involved in patient discharge, the dynamics that exist within these roles, and each person's perception of their own involvement in discharge. Participants commented that discharge decisions are made collaboratively, with RNs proactively managing discharge. It was however noted that no robust discharge system exists, and that different health care roles vary in their prioritisation of discharge, with extensive comment also made on the effect acuity and workload have on discharge prioritisation. Finally, communication was discussed, with participants describing it as generally good in intent, however, commenting that communication tools are faulty and that this negatively effects team dynamics.

5.3.2 Theme 2 – Preparation, clearance, home.

The second theme was composed of two categories: discharge planning, and ready to go home. These two categories were made up of nine codes which were needs anticipation (four codes), discharge anticipation (47 codes), MDT input (33 codes), whānau engagement (16 codes), patient engagement (14 codes), location/transport (21 codes), EDD (26 codes), discharge process (141 codes), and discharge readiness (104 codes).

This theme related to the process in which a patient is prepared for discharge, medically cleared, and is discharged home. Participants described the practise of discharge planning, what it means for a patient to be considered ready for discharge, and the details of the discharge process. Within this theme, the concept of the need for discharge preparation clearly emerged. The charge nurse manager identified

discharge planning as an essential part of holistic patient care, and described the patient as being let down when it is neglected.

> *"I feel like the patient's being let down when, if someone comes to me with a few hours to go and they say, "I just found out that this person doesn't have anyone at home", or "they just don't think that they can mobilize well enough' or "we never got physio input". I just think we've really dropped the ball, and we haven't cared for that patient holistically, and we've been focusing too much on the, here and now of caring for them."*
>
> Charge nurse manager

Other participants emphasised that discharge planning and patient needs anticipation/identification must start from admission to prevent last minute delays.

> *"The discharge process should really start right from the day of admission. Thinking what objectives, what tools, what things we need to do to get that patient ready for discharge"*
>
> Senior operational manager

> *"Just on admission, making sure you've got like a clear baseline of where they live and whether anything would need to be put in place."*
>
> Physiotherapist

It was also stressed that discharge planning should be considered every day and the discharge plan progressed and reviewed.

> *"We should be having a clear plan of care of what it is that we're wanting to achieve, and we should be reviewing that plan and making modifications, and putting these processes and things in place in order to get them home."*
>
> Senior operational manager

> *"And then during the stay in hospital, I think every day you have to keep that conversation happening about what the goal is going home, who's going to be home, how you're progressing towards that goal."*
>
> Charge nurse manager

One nurse agreed that discharge planning must start on admission, but reflected that in high acuity environments discharge conversations are difficult to have because the nurse is focused on the more urgent clinical tasks required for that patient.

> *"Start the discharge plan at admission…the demand for the nurse is so high that you might not get to ask till day two, "where do you live," or "who do you live with" - really*

> *important conversations for identifying patients that are going to stay for a longer time, and the patients that need like MDT input"*
>
> Senior registered nurse

Participants also described the importance of engaging with the patient and their whānau in discharge planning and anticipation so that all parties understand the discharge expectations and requirements. This quote from hospital management articulates the need for patient and whānau focused discharge planning well.

> *"I think we don't set them up right in the beginning. So, our communication with them, we're looking at discharging on this day, allowing the families to prepare. And 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

This same concept was echoed by other participants, citing the importance of whānau engagement for discharge planning and patient outcomes.

> *"It's really important that we try engage with the family and say, if dad's going to come in for the surgery, we really need someone to be with him when he goes home for a few days. And just let the family know that he'll be in hospital for three or four days and then be home."*
>
> Senior operational management

> *"Just talking with family as well is really, really important. If you can engage someone's family that makes huge difference in terms of discharge planning."*
>
> Physiotherapist

Participants also reflected that if patients are not engaged with regarding their plan of care and discharge planning, they may feel blindsided by their discharge and unprepared, despite being clinically dischargeable.

> *"I think if you try and talk with the patient from day zero as well, like "these are the expectations, that post-surgery you might be in for like two days", and just being as real as you can that actually "your discharge will be in 24 hours 48 hours". so that they don't underestimate or overestimate their stay…But I think the discussion of discharge should always be a daily discussion. On day of discharge, sometimes they can be a bit blindsided to hear "oh you can go home now".*
>
> Senior registered nurse

> *"And they're not expecting it, they don't feel completely right, or they've been told the day before they might need an MRI, then it's like "your bloods are good you're going home""*
>
> Associate charge nurse

In terms of discharge anticipation, EDDs were also mentioned by the managerial cohort of interview participants. They described EDDs as an essential tool for patient flow modelling, but one that is underutilised and not engaged with by clinicians.

> *"There is, (value) if you use a tool properly, one of the things I kind of enforced in the nurse managers for the wards was "please make sure your EDD is truly reflective because actually that's great for modelling and patient flow".*
>
> *I think those that are on the floor, really don't even get involved. It's more of an administrative task. So I don't think it's a true reflection of actually what the EDDs are…not particularly well taken on by the clinicians."*
>
> Executive nursing management

Managers reflected that although the tool holds potential, its current treatment renders it largely arbitrary.

> *"It's an ambiguous number, and it's essentially just picked at random. I think you often have an administrator entering the EDD just because every patient needs to have an EDD."*
>
> Executive nursing management

> *"The receptionist puts it in on the referral when they put them patient into IPM, they make it automatically 48 hours. And then I adjust it accordingly… No one refers to it. And I'm probably the only one that looks at it just because it's part of my job that I have to… We could talk about EDDs more, I could make it a thing, more of a responsibility that I should be talking to the nurses more about the EDDS, because if you're the primary nurse, why am I taking responsibility for the EDDs?*
>
> Charge nurse manager

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. Discharge readiness, in an acute care setting, was described as when the patient does not require hospital level care for their recovery.

> *"They'd be ready for discharge when sort of all their bloods are back, they've been clinically stable. The presenting complaint was kind of we found a cause for, and I guess sometimes we won't fix things, but when they're ultimately sort of safe, that they don't need hospital care for their rehab or them getting better that they can do so at home safely."*
>
> House officer

> *"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

All parties interviewed emphasised that, in addition to clinical needs, discharge readiness is wholistic.

> *"You've got to look at the patient as a whole, not just "this is the issue that they had, we fixed it, time for them to go home". It depends on if they are able to go home safely. It's not just looking at that aspect of just being like "we fixed this problem, they had appendicitis," you have to look at the whole picture."*
>
> Junior Registrar

> *"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

As described in these quotes, part of holistic discharge readiness is ensuring the patient can go home safely, with all their essential needs met. Here the role of MDT services is critical. Waikato hospital employs a range of professions who can be referred to as needed by the patient's primary nurse or other party involved in their care. The services most frequently referred to in acute adult surgery are Physiotherapy,

Occupational therapy, Speech and Language therapy, Social work, Dieticians, Pharmacists, Kaitiaki, and Chaplaincy. In this quote, the physiotherapist describes some of these roles.

> *"So where physiotherapy specifically looks at mobility, occupational therapy looks at your ADLs so I might look a walking but OT technically looks at getting in and out of bed, chair transfer, showering and making a cup of tea. Social work looks a lot more at the supports on discharge. So patients social status if they're isolated that kind of thing if they're needing supports, like Meals on Wheels, or more complex with disability support assistance."*
>
> Physiotherapist

She emphasised that all parties involved in discharge need to agree that the patient is safe to discharge, and that includes the patient clearing themselves for discharge.

> *"The patient has to feel safe to discharge, that's the number one thing for patients, even if they're walking independently, but they're going I don't feel safe to go home. That's the thing. So when the doctor said they're clear, the patient says they're cleared…And then I guess when the appropriate MDT is kind of cleared them as well. So I guess when everyone's in agreement, that there is no concerns about going home."*
>
> Physiotherapy

Once a patient is cleared by all the appropriate team members, the question becomes where the patient goes from hospital. The challenge of discharge location was raised at several points throughout the interviews. For some patients, it may not be appropriate for them to discharge directly from hospital to home, instead they may require some degree of post-acute care.

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

Participants described bed availability in post-acute care as a challenge and as a cause of discharge delay.

> *"It depends where they're going. Sometimes you find rehab is bed blocked, sometimes convalescent care will be full. That's influenced by things like COVID and time of year and everything else."*

Physiotherapist

> *"It's about placements you know, it's all about availability…Its all well and good that we say, "hey...you need this service", when we're waiting seven to 10 days for a suitable placement."*

Associate charge nurse

Some participants also described confusion and inefficiency within the referral pathway. If a patient appears to require post-acute care of some degree, it can be challenging for RNs to know which service to refer to, and whether to refer to MDT services first. One RN described the referral process as confusing but stated that once the discharge location decision is made, the transfer process is more straightforward.

> *"I think there's a confusion over the difference with the DSL and the opal services, that's very confusing about who does what, and who gets referred where, and who is entitled to what. Its more the confusion thing as to where do we go, but once we've decided where they're going, and it's relatively easy."*

Associate charge nurse manager

Some participants also described a period in a patient's recovery where they do not require acute care but are either not yet suitable for rehabilitation services or are waiting for a bed, so while they wait for an appropriate service, they remain on the acute ward they were initially admitted to.

> *"I think it's like a real transition point for some people where they're not quite rehabable yet, but they're no longer needing an acute service. They kind of sit in that little zone of "where are we going to put you?", so they just end up staying at the ward that they were admitted to."*

Senior registered nurse

Similar issues were described regarding the transport element of the discharge process. Waikato hospital treats patients from a large geographical area, and since many patients are transferred to Waikato hospital acutely, they often do not have a convenient means of returning home – in this case, the hospital staff must organise transport for the patient. This quote demonstrates how lack of transport resources delay discharge.

> *"Transport is a big issue. Now, whether that be an ambulance, car, helicopter or plane, we use all of those on a daily basis, and you know, 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

One region that was commented on consistently was Thames Hospital transfers. Thames hospital is one of Te Whatu Ora Waikato's peripheral hospitals which services the coromandel. Concerns were raised by participants about the number of patients transferred from Thames acutely who, after assessment, do not require tertiary care, and are discharged the following day. This was described a major cause of discharge delay as patients often do not have a means of returning home.

> *"A lot of patients come over from Thames in the afternoon here to be assessed, and then they're seen, and they're discharged, then you've got to get them back to Thames. And I think that's just terrible that we bring here in the first place. Because we did do a little bit of a study on it and of the patients that come over 80% don't have surgery and are discharged within 24 hours. It's just crazy but they just want that surgical consult… So, bringing those patients over, then trying to get them home, that is a real problem. Because often they come over in the middle of the night or you know, late in the afternoon, and then they're stuck here because they've got no way of getting back."*
>
> Senior operational manager

In summary, the theme 'Preparation, clearance, home' covered the process in which a patient is prepared for discharge, is cleared for discharge, and is transported home, as well as the strengths and challenges of these practices and processes. Participants commented on every stage of the discharge process beginning with preparation, where they noted the importance of discharge planning and needs identification. Participants affirmed that discharge planning must begin on admission and considered daily, and also must involve the input from the patient and their whānau As in the first theme, participants noted that high workload is a barrier to staff engaging in discharge planning in this way, and that tools such as EDDs are poorly utilised and thus ineffective. The process of being cleared for discharge was described as being wholistic with involvement from MDT where needed. Finally the patients transition home was covered, with both post-acute care and transport details discussed.

5.3.3 Theme 3 – improving discharge

The final theme that emerged within the qualitative data concerned the ways in which discharge could be improved. Within the interviews, participants reflected on ways in which the existing discharge process could be optimised, and on new ideas that could improve the discharge process if they were introduced. The third theme of 'improving discharge' were composed of two categories; optimising discharge, and investing in discharge. These categories were informed by eight codes; resources (26 codes), time to treatment (8 codes), discharge delay causes (12 codes), nurse led discharge (15 codes), criteria based discharge (10 codes), clinical nurse specialist role (six codes), nurse practitioner role (six codes), and transit lounge (44 codes).

Discharge related communication was described as generally positive in intention and nature, but with areas of inefficiency that contributed to discharge delay. One area of inefficiency discussed by participants was documentation by the treating team. Participants expressed concern about the clarity of documentation and plans across the health care team. The plans written up by the treating team on the morning round were described as too vague for an on-call house officer to follow. This was frequently attributed to discharge delay, as a patient who was for discharge in the evening pending blood tests etc. will not be discharged by the evening house officer if they do not feel confident enough to discharge the patient based on an unclear plan. Both nurses and doctors recognised that if a plan is not sufficiently clear, an out of hours house officer cannot safely or confidently discharge a patient.

> *"Sometimes we are just so reliant on scribbled notes that we can't read. And if I can't read them, then maybe the doctor who's on after hours can't read it and says "oh I'm not really confident that they said they could go.""*
>
> Charge nurse manager

> *"And I think if you're if you're leaving clear plan 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 safter thing is to say she's saying"*
>
> Surgical fellow

The house officer articulated this situation clearly, emphasising that most house surgeons will not feel confident to complete a discharge out of hours, unless the plan for discharge is explicitly confirmed.

> *"Because the on-call house officer will have no idea about the patient. Unless it is clearly documented, "White cells normal, CRP down trending", but even then, a house officer, especially general surgical ones are usually first year, won't feel great about discharging a patient, just because of lack of experience and confidence. How can we change that? I don't know. When the house officer is rounding with the registrars at three o'clock in the afternoon those bloods are back, we're happy to discharge them, and then that team can discharge them. Or at least hand over that this patient can go home."*
>
> House officer

The senior hospital manager felt that this challenge could be avoided if the primary team wrote clear and legible plans with an out of hours house officer in mind.

> *"I think sometimes if it was all done in the morning and done properly, and if there's a really good plan, then it could facilitate discharges more in the afternoon, and particularly on a Friday. If they did a really good clear weekend plan. That, you know, we aim for the patient to go home on Sunday, if they're pain free on Saturday and mobilizing, eating and drinking, then our plan is for them to go home on Sunday. That would give the house surgeon confidence to make that decision. But often that's not clearly documented".*
>
> Senior operational manager

Regarding discharge planning communication between nurses, one nurse felt that a discharge planning tool could be helpful to streamline nursing communication, but another felt that discharge checklists add work without adding value.

> *"I think maybe if we went to an electronic based system and you kind of like finish your shift with a tick box as to what you've done for that shift and next person just sees it as an overall, like have you provided education, and you tick yes/no and write a comment about what education you've given that patient so that the oncoming nurse can continue where you've left off."*
>
> Senior registered nurse

> *"I think it does just add another form. And how much do you actually put on that form because one discharge might be quite simple, but another one might have masses of stuff on it. If people are looking at simple discharges and there's too much on the form people get quite slack filling things in."*
>
> Associate charge nurse

This mirrors the findings of the literature review, where the benefits and challenges of discharge planning tools were discussed. While a discharge checklist or tool may be useful in some contexts for some patients, if it is applied to patients who do not require such intensive planning, inefficiency is increased rather than decreased (Gonçalves-Bradley et al., 2016; Mabire et al., 2015).

Participants also highlighted the timing of surgical diagnostics and treatments as an area that could be optimised. Some services within surgery are unavailable, or decreased to an on-call service, out of hours. Although, as discussed in the literature review, this is appropriate to some degree, participants expressed that some service reduction is a false economy. The purpose of this study is to focus on discharge delay in the period after the patient is medically clear. However, this delay to the pre-medical clearance portion of the patient journey is important to acknowledge, because the two time periods are so intimately linked. Additionally, the timing of access to diagnostics may delay discharge due to the timing mismatch between diagnostic report availability and the morning ward round. 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. However, if a patient only attends an ultrasound on Monday morning, despite the scan being requested on Saturday, the timing of the medical review and then diagnostic information being available is unsynchronised and discharge is delayed.

> *"Theatre for people who really should be sorted and then get out of here…someone's on the board for like 48 hours, whereas they should be able to get home the same day of the operation, and then it's just this false economy that we're paying more for hospital beds, we don't really have hospital beds because we don't have enough theatre space. And scans can be similar, especially over the weekend, lack of ultrasounds. No diagnosis over the weekend means we can't move anything forward. The argument often that we get from radiology is it doesn't change anything over the weekend. But it might delay things…and I think a diagnosis is actually important."*
>
> Surgical fellow

> *"The scanning is a big thing because how many patients do we get that come in on a Friday and have to wait two days to get an ultrasound whereas they probably didn't need to be here for all that. That is a huge delay on discharges, and then results not being available once the scans done which then is another few hours."*
>
> Senior registered nurse

The same desynchrony applies to blood tests. Many surgical patients' discharge readiness is dependent on the improvement of specific blood results. Often, patients are seen on the morning ward round and are told they are cleared for discharge pending satisfactory blood results. This is especially the case in the surgical assessment unit involved in this study, as patients are often admitted overnight for observation, and if their blood tests have not worsened, they can be discharged the following morning. Blood tests, however, are usually taken by the phlebotomist after the morning ward round, with laboratory results only available for review later in the day. If the treating team were able to see the mornings blood test results at the same time as they reviewed the patient, in many cases a discharge decision could be made on the ward round. The house officer described this problem as it relates to discharge delay.

> *"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 11 o'clock midday, and sometimes never come back till two o'clock. And not necessarily everyone needs bloods early in the morning, but I think, especially our surgical patients, that the bloods kind of determine the plan for that day."*
>
> House officer

He further stated that the practice of drawing early morning blood tests, often referred to as "0600 bloods", from patients who were likely to discharge improves discharge.

> *"If we're thinking of discharging a patient, the nurse can sometimes set the bloods at six in the morning so they're ready at eight o'clock, nine o'clock, so we're not waiting around for bloods. So that's one little thing that's done."*
>
> *"…some patients that are kind of ready to go home. They definitely (could) have 0600 Bloods, which will make them much quicker to discharge."*
>
> House officer

Other participants agreed but observed that the benefit of early morning bloods tests is dependent on staffing resources as nurses must be available to draw the bloods, and house officers must be available to complete the paperwork.

> *"Depends on the patient load. I think if we had like 10 patients and I saw 0600 bloods and they were all great, obviously they can go home, it would then depend on the house surgeon to be able to detach themselves away to actually do the discharge."*
>
> Junior Registrar

> *"Because if we could do all of that discharged bloods between five and six o'clock in the morning day of discharge, they were ready for the team rounds I mean that'd be very ideal, but again it's a matter of the numbers on the floor."*
>
> Associate charge nurse manager

The process of house officers completing discharge paperwork was described by several participants as inefficient. The discharge summary needs to be typed by the house officer, drawing information from a combination of written notes, including the assessment/admission note, operation notes, and daily ward round notes, as well as digital records and results. Participants described this method of compiling a discharge summary as extremely time consuming, and felt that by improving this process, discharge delay could be avoided.

> *"there's some generic paperwork that could be established. So all that would be required would be for your house officer to perhaps, you know, just fill in the blanks. I think that would be really helpful."*
>
> Executive nursing manager

> *"In Wellington DHB, they have a process where the admission is actually computer typed into the clinical workstation. And what that means for us is that we just literally copy the admission or the presentation, paste it into our discharge summary, write the progress and like 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 the plan. I don't see why we can't implement admission note that is typed on the computer. And that will make it a lot quicker for the discharge summaries."*
>
> House officer

The concept of nurse led discharge and criteria-based discharge was also discussed as one way to avoid the discharge delayed caused by wating for paperwork.

> *"Perhaps have nurse led discharge, or criteria-based discharge. Because for a lot of the routine stuff, I think, what are we doing, why are we always going back to relying on our doctors to do the discharge? If we had a very clear criteria-based algorithm then that would, that could actually serve us very well"*
>
> *"I think it's a great solution…and particularly for the acute pathway as well. Because, you know, there's some real basic stuff you guys do"*
>
> Executive nursing manager

Both registrars described nurse led discharge as appropriate for certain patients.

> *"And I think something that needs to be utilized is nurse led discharges. I did them quite a lot as a house surgeon. When I was on paediatric surgery, I would just do the discharge summary print it off, put it in the notes and just say nurse led discharge."*
>
> Junior Registrar

> *"I think it's really good. I think, especially for those people that for some social issue that had to say another 24 hours, can't get a ride, but they've been medically cleared. The house surgeon can do all the paperwork the day before and they can have a nurse led discharge the following day. Even ones like abscesses where you've done it in theatre, you've got a clear plan in the theatre note, like discharge when comfortable, kind of like a day stay type thing, that's all suitable for nurse led discharge."*
>
> Surgical fellow

Criteria-based discharge was also described as appropriate for some patients

> *"Because the variety of patients we get, it's so variable. But I think things like lap choles and lap appendixes… there could definitely be a protocol for that. It's just a matter of finding a protocol and getting people on board"*
>
> Junior Registrar

All participants who discussed CBD/NLD described it as, in principle, a robust idea. However, several participants had concerns regarding its implementation and did not feel that CBD/NLD would be able to function well within existing workplace policy and structures. Participants stated that the main barrier to successful CBD/NLD was the completion of discharge paperwork. Although a patient may meet discharge criteria as assessed by the RN, the process if not made more efficient unless the discharge paperwork can be completed shortly after the discharge criteria is met – which is not significantly different to the existing discharge process.

> *"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, unless they did it the day before and they didn't like doing that. It didn't really facilitate the discharge."*
>
> *"We used to do it for post tonsillectomy. But again, the doctors will always come at eight o'clock in the morning, check the tonsils and go "Yeah, you can go home" so it didn't actually make (discharge) any earlier."*
>
> Senior operational manager

Previous models of CBD trialled within Waikato DHB have required a patient to be identified as suitable for CBD by the surgeon completing their operation. In the case the discharge paperwork must be completed before the patient returns to the ward, so that once the patient meets the criteria for discharge, they can leave immediately with all the appropriate paperwork. Although this is current practice for elective day surgery cases, for acute care, participants stated that this component of the CBD process was untenable.

> *"Ah you know, that will never, that hardly gets done. That's the problem. The problem is also, the person who does the operation, the patients won't always be under their team, its actually just the acute team that's in theatre and they usually just send (the patient) back to the ward and the primary team can do (the discharge)."*
>
> Junior Registrar

The senior registrar also reflected that, although CBD may work well from an efficiency perspective, this efficiency may be at the cost of patient experience.

> *"I think from is from a hospital and medical point of view it's fine. I think from a patient experience point of view that's where it would fall because I think a patient probably wants to see the doctor who operated on them…I think that is a little bit of a gap and the patient says, "so I've had this operation, now sure, I'm doing fine, but I kind of just want to talk to the surgeon who did the operation." I think that is probably one area when it falls a bit flat."*
>
> Surgical fellow

Many participants suggested that although interventions such as CBD/NLD have potential, the most prominent need to address is staff resource. Since such a great degree of discharge delay is attributed to staff not having time to complete the tasks necessary to facilitate discharge, participants suggested introducing staff resource specifically dedicated to discharge. Participants suggested that a nurse practitioner or clinical nurse specialist role would improve the acute surgical unit as it would introduce a semi-static staff member whose role would focus on admissions and discharges, rather than surgery.

> *"[Auckland DHB] had a nurse practitioner and (they) admitted and discharged but didn't operate. She would facilitate all the discharges, she would organize all the diagnostics, all of the bloods, check the bloods, and then she would discharge patients and it would save a lot of that time because, you know how often the doctors are in theatre or you can get hold of a doctor for whatever reason. The nurse practitioner she was a prescriber, so you could probably do it with a nurse with prescribing rights, they*

would do the discharge letter, and the prescription and be able to discharge patients. I do think it could be model that would be good within surgery to facilitate some discharges."

Senior operational manager

"One of my findings when I did some read my research, was that some ASUs in Australasia, do have a CNS or a nurse practitioner, and then it's her role to help facilitate discharge and be able to discharge some those patients in a nurse led role"

Charge nurse manager

The senior surgical manager explained that one advantage of a Nurse Practitioner within an acute surgical unit is that they are hired for that role and do not rotate, allowing them build robust relationships amongst staff members and facilitate effective treatment pathways.

"With healthcare being a limited resource…that nurse practitioner group is a really valuable resource and would be really beneficial. And one of the benefits of the nurse specialist or nurse practitioner within surgery was that they got they weren't rotating all the time. So she will have those relationships with the surgeons and the nurses and be able to facilitate more action, get stuff done, which really helped"

Senior operational manager

She went on to explain the potential scope for a Nurse Practitioner within the entire speciality of general surgery and the wholistic and far reaching benefit of the role.

"I'd like to implement a nurse practitioner for general surgery, who 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… I think up here would be a really good place to start. Particularly, you know, the abscesses that you get here and then you're waiting for doctors to come after theatre and I+D them in the afternoon. Now if you had someone that could do that, then discharge them that would be really good."

"And it wouldn't just be for here, if you look at general surgery, for example, there's ward four, two, twelve. So there's a lot of work….If all of the teams could link on to that one person that does all the discharge stuff, I think that would help."

Senior operational manager

The role of a discharge coordinator was also discussed, however participants pointed out that where this has been implemented, it is often at the loss of an RN from the floor, which increases the patient load per RN.

> *"Its quite interesting because they've taken nurses off the floors, and the nurses on the floor have got more patients. And yeah, a discharge coordinator is coordinating the discharges, but they don't necessarily know the patients as well when they're so busy."*
>
> Associate charge nurse manager

A discharge coordinator may improve some of the nursing related delays to discharge, such as coordinating rest home transfers, but does not address the delays related to completing discharge paperwork. In relation to this bottle neck, one nurse felt that house officers having a dedicated hour to work on discharges would improve the prioritisation of discharge and decrease discharge delay.

> *"I just wonder from like a house officer perspective, if they were allocated an hour every day to start discharge summaries and so that they're always just like continuously building on a discharge summary as opposed to having to write everything right then and there on day of discharge."*
>
> Associate charge nurse manager

If the discharge bottle neck related to completing discharge paperwork cannot be amended, patient flow can still be improved by moving discharging patients from the acute ward environment to another area while they wait for discharge paperwork. The transit lounge exists for this purpose. Although a transit lounge does exist within Waikato DHB, participants described it as not being well utilised.

> *"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. And, if you look at the hospital about you know, only about 10% of our discharge patients go through transit lounge…40 - 50 % (is the goal)"*
>
> Executive nursing director

The deputy chief nurse described several barriers to the effective utilisation of transit lounge.

> *"When I've called around the ward saying, "your patient can go to transit", it's maybe two or three hours before the patient actually gets there. So, it may be because the attendants are busy, or it may be that the doctors want to do the discharge letter before the patient goes down, or the medications haven't come up to the ward to go down …actually all those things could be done in transit."*

> *"I think it needs medical engagement. I think that's a big issue. I think doctors, particularly the junior doctors, you know, if they've got 10 dischargers and in different areas, then, you know, they've got them going down to transit some there some on the wards, it's quite difficult for them to manage. So, whilst it has its positives with it, there's also some disadvantages."*
>
> Executive nursing director

Participants broadly agreed that patients who have all their discharge requirements completed and are simply waiting for transport should discharge via transit lounge. However, there was disagreement between participants around whether patients who had not yet been completely cleared for discharge should be sent to transit lounge in anticipation. The participants involved in management stated that sending patient who are for discharge pending their final blood tests was appropriate, as most patients will proceed to discharge, and the small proportion whose blood tests are not acceptable for discharge could be brought back into the ward environment.

> *"If the doctor has said in the morning that patient is for discharge then…if you're waiting for bloods or whatever, then you can wait down in the transit lounge… and if you had to bring patients back, you could put them into the (acute surgical) unit for a few hours"*
>
> Senior operational manager

> *"It's a real shame. Because, for the odd one that's going to have to go back to the ward, actually, there's a bigger win here. But I think you know, particularly junior doctors are really risk averse"*
>
> Executive nursing manager

The other participants however stated that discharging patient to transit lounge before final blood tests have returned has risk from a patient experience perspective. The nurses interviewed described a situation in which the patient's bloods had deteriorated, and she, therefore, had to be readmitted to the ward

> *"We tried, before we sent her to the discharge lounge, to contact the house officer with no success so then I just made the decision to send her down. the house officer finally came up and was like "where is this patient, they've got to come back in, their bloods are worse than they were." So it all kind of escalated to the fact that this lady who was sitting in transit, thankfully was still there and to come back to us for further investigation. And family were very upset because they had travelled to collect her and she really wanted to go home."*
>
> Senior registered nurse

The doctors interviewed agreed that patients should not be sent to transit lounge until their blood tests have been cleared.

> *"Don't send them to transit pending bloods, because if the bloods go off, they have to bring them back to the ward."*
>
> Junior Registrar

> *"If you sent one of those patients to transit lounge, then it's just a waiting game, the house officer has to check with the registrar that they're happy with those bloods at 6pm at night, and then transit lounge is closing so what do they do with the patient?*
>
> House officer

The house officer discussed how writing a discharge summary in transit lounge can be a challenge. If, in the process of writing the summary, it is found that something hasn't been done, it is difficult to return the patient to the ward for further care.

> *"Doing discharges in transit lounge… They're just a pain, and not because we have to walk down to the other side of the hospital. It's just that they're just not equipped for us to sit down and look through the notes and if something comes up, it's very hard to do a u-turn from transit back up. So for example, if we're not happy with some Bloods, or we're not happy with a follow up plan, it's really hard for us to hold the patient because transit is literally just a sit down get up and go kind of place. Getting investigations in transit is just, you know, we want an ECG, we want some bloods. Getting that sort of stuff, the nursing care is not there. The ratio isn't there compared to wards"*
>
> House officer

The physical distance to transit lounge was also addressed by participants. Some felt that the time it takes for the house officer to walk down to transit lounge meant that discharge paperwork is delayed even further

> *"I think also location in the hospital makes a huge difference. If you go to transit lounge, you're not going to get discharged earlier than later, because it's such a treck to get there."*

> *"I hated it when I was on cardiothoracic because the charge nurse would do it without letting us know. And we had to take ICU notes down there to do the discharge summary and then they would also shove patients in medi-hotel so I was going between medi-hotel, transit lounge and M14"*
>
> Junior Registrar

The registrars suggested that sending a cohort of patients to transit lounge would make the trip more worthwhile for the house officers, or that having a discharge specific house officer located in transit lounge would improve the efficiency of the system.

> *"Someone who gets into transit lounge, while its good for beds, you do five minutes walking down there, then you have to walk back to the ward for something else. And that used to be frustrating. I didn't mind if everyone was transferred there because then you could just sit there and do everything."*
>
> Surgical fellow

> *"It would be good if there was a transit lounge house officer. And there was someone assigned to do discharge summaries there. Doesn't matter what specialty you are as long as the plan is clearly outlined."*
>
> Junior registrar

Within this final theme, 'Improving discharge', participants reflected on ways in which the existing discharge process could be optimised, and on new ideas that could improve the discharge process. Participants discussed improving documentation clarity, and the pros and cons of introducing a discharge tool to improve discharge related communication. The timing of diagnostic test availability was discussed, as well as the process of completing discharge paperwork. The concepts of nurse led discharge and criteria based discharge were both discussed as alternatives to the existing discharge process, while adding a discharge focused clinician was considered as an adjuvant to the existing system. A House officer, Discharge coordinator, Nurse Practitioner or CNS were all considered by participants as appropriate. However, the importance of adding staff resource rather than moving a clinician from another area was emphasised. Finally, transit lounge was discussed as a means of reducing discharge delay from wards if the actual discharge process cannot be expedited, with the areas strengths and weakness discussed.

5.4 Qualitative findings summary

In summary, the qualitative data reveals participants thoughts and observations related to the discharge process, specifically regarding discharge delay. 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 first theme, 'it takes a village to discharge a patient' explored the varied staff roles involved in patient discharge, the dynamics that exist within these roles, and each person's perception of their own involvement in discharge a well as the involvement of other roles. The second theme 'Preparation, clearance, home' covered the process in which a patient is prepared for discharge, is cleared for discharge, and is transported home, as well as the strengths and challenges of these practices and processes. Within the final theme, 'Improving discharge', participants reflected on ways in which the existing discharge process could be optimised, and on new ideas that could improve the discharge process. Together, these findings provide insight into the many different factors influencing discharge delay, and solutions that may reduce it.

Part 2: **Quantitative** findings

5.6 The sample

A total of 40 patients were audited during the two week period and of these, a total of 32 were female and eight were male. The sample were mostly NZ European (n=26) with the next largest group, Māori (n=9), and five reporting as of another nationality. Of the patients who were discharged, a total of 25 patients were discharged during the morning shift (0700-1445), 15 during the afternoon shift (1445-2300), and none during the night shift (2300-0700). A summary of these data is represented in table 2.

Table 2: Phase two sample demographics

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

5.7 Factors

Through the audit process a range of factors were identified that participants felt were responsible for contributing to discharge delay. Factors derived from the qualitative data were listed on the audit form and were able to be selected by the nurses completing the audit if they applied to their patient. On completion of the audit, the frequency of the factors occurrence was calculated to determine the prevalence of the various factors. These factors and their occurrence rates are outlined in table 3.

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)

Of these 21 factors, the factor that occurred most frequently was 'waiting for paperwork' with 22 instances recorded, meaning that 55 percent of the audit population experienced delay due to this factor. This was followed by 'waiting for transport' with 17 instances recorded, and 40 percent of patients experiencing delay due to this factor. The remaining 19 factors were recorded between one and four times across the audit population. Several factors were included in the audit form as potential causes of delay, but were never attributed as causing delay. These factors were 'waiting for post-acute bed', 'communication issue', 'waiting for OPAL/DSL', 'RN concern about discharge' and all of the waiting for MDT factors; physiotherapy, occupational therapy, social work, and dietician. During the audit, none of these factors were recorded as contributing to discharge delay.

Of the 40 patients audited, three patients had no delaying factors recorded, 22 had one factor recorded, 10 patients had two recorded, three patients had three recorded, and two had four factors recorded. The largest overlap of factors appeared to be 'waiting for paperwork' and 'waiting for transport' as, of the 17 patients who were recorded as delayed due to waiting for transport, five (29%) of these patients were also recorded as delayed due to waiting for paperwork.

5.8 Non-productive time

The quantitative data highlights the significant amount of non-productive admission time occurring on the sampled ward. Discharge delay time is non-productive because the patient is not receiving any care that requires them to remain in hospital, and is merely waiting to leave the acute environment. Time is a limited resource. Ensuring this time resource is used efficiently is imperative to a well-functioning health system, as the amount of time patients spend on a ward directly impacts the number of patients that can be treated on that ward. To maintain patient flow and ensure patients who require acute care can access it in a timely manner, non-productive ward time must be minimised.

Across the 40 patients sampled there was a total of 10,185 minutes of delay recorded, with a mean delay per patient of 225 minutes (3.75 hours, or almost 8% of the total stay). Each of the 17 surgical beds on the ward has the maximum potential of 8,760 hours per year. The 17 beds (using an 85% capacity model) can accommodate a total of 2,637 patients using a mean length of stay of two days. If each patient has a mean 3.75 hours of delay as seen in the audit, removing this delay would generate 9,889 hours (412 days) in total over the year, potentially allowing for a further 200 patients to be admitted to the ward over the year.

5.9 Quantitative findings summary

In summary, the quantitative data highlighted useful demographic data information about the patient cohort, and revealed the range and frequency of factors that delayed discharge for this population. Of the recorded factors, waiting for paperwork and waiting for transport occurred most frequently. Across the population significant

delay was recorded at an average of 3.75 hours per patient. This demonstrated the meaningful gains that could be made if this unproductive time was removed.

Chapter VI: Discussion

> *"He aha te mea nui o te ao? He tangata he tangata he tangata (What is the most important thing in the world? It is people!)"*
>
> Whakatauki

6.1 Introduction

A mixed methods study allows for research questions to be approached from multiple vectors. Qualitative and quantitative methods answer questions in different ways, resulting in a nuanced understanding of the topic being studied. The process of data triangulation amalgamates the information derived from the qualitative and quantitative data, bringing the two together to produce a synergistic analysis of the research questions. This chapter will be organised by first answering the three research questions through the data triangulation process, followed by a discussion on the relevance and implications of the answers to these questions.

Part 1: Research questions

6.2 What are the features that cause discharge delay in an acute surgical assessment unit?

Discharge delay is a complicated phenomenon, and although it is well established as an issue, its causes are not well understood. Understanding the factors that contribute to discharge delay is imperative to addressing the issue effectively. This research explored the features that cause discharge delay within an acute surgical unit. The study results revealed that the most significant cause of discharge delay is delay in the completion of discharge paperwork, followed by transport related delays. Other factors were also implicated in the study as causes for delay, these 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.

The qualitative data collection in this study ultimately focused on participants observation of the cause of discharge delay, and what they thought may reduce this delay. By discussing both the cause of delay and its potential solutions, the perceived cause of delay was able to be observed from two positions, allowing for a comprehensive understanding of the participants thoughts. Through the general inductive process, clear themes emerged across the participants. The cause of discharge delay most consistently addressed within the qualitative data was delays related to the process of completing discharge paperwork. Transport and post-acute care related delays, communication, discharge planning, and multi-disciplinary team input were also discussed by participants and emerged as themes within the qualitative data. Across these themes, workload/acuity and staffing deficits were frequently implicated as secondary causes, with participants noting that a system or process may be robust in theory, but become a cause of discharge delay when acuity increases or staffing decreases outside the parameters the system can tolerate. It is vital to note

this nuance; many causes of discharge delay demonstrated in this study only causes discharge delay when acuity and staffing challenges are also present.

The quantitative data gathered from the survey established the frequency of various delay factors occurring for each patient, providing a numeric answer to the research question. The most frequently occurring factor was 'waiting for paperwork' (55%) followed by 'waiting for transport' (40%). A total of 11 other factors were recorded as contributing to discharge delay, however these factors made up a comparatively small proportion of the recorded instances, and were only recorded as occurring between one and four times within the data. Eight further factors were included in the audit based on the themes derived from the qualitative data analysis, but were not recorded as contributing to delay during the audit.

Although a vast body of literature exists on discharge delay broadly, limited literature exists on the causes of discharge delay after the point of medical clearance. Of the studies that did provide relevant conclusions to the research questions, discharge delay was attributed to a range of factors including social work or therapy requirements (Bai et al., 2019; Hendy et al., 2012), age and co-morbidity (Bai et al., 2019), administrative or organisational issues (Ou et al., 2009; Victor et al., 2000), and post-acute care delay (Cai et al., 2020; Ou et al., 2009; Roberts et al., 2018). These factors are comparable to the factors established in this study, with the exception of patient intrinsic factors such as age and co-morbidity. Although intrinsic patient factors were discussed within the qualitative data, the cause of delay in these instances was attributed to the factors related to patient needs arising from their demographics. For example, age was not considered a delaying factor in itself, however, older patients may require post-acute care or multi-disciplinary team input which may delay discharge. In these instances the extrinsic factor was recorded as the cause of discharge delay as it is not older age that delays discharge but the potential needs arising from older age.

The concept of high-acuity environments exacerbating discharge delay was also supported by the literature (Berry Jaeker & Tucker, 2017; Kuluski et al., 2017), echoing the thought expressed in the qualitative data that under a heavy workload, staff have limited time to facilitate a discharge home.

This information can be triangulated to conclude that the main factor that cause discharge delay is paperwork delays, followed by post-acute care and transport requirements. Other factors are also implicated, including organisational factors such as communication, discharge planning, and multi-disciplinary team input. Having established the causes, it is equally as important to establish their effect.

6.3 What is the impact of discharge delays in an acute surgical unit

It is widely understood that discharge delay has negative effects on both patients and health organisations. This research explored the impact of discharge delay in an acute surgical unit, aiming to understand the nature and extent of these negative effects. The study demonstrated that discharge delay with the acute surgical unit is extensive, with a total of 10,185 minutes (169 hours and 45 minutes) of discharge delay recorded over the two-week audit period. This extensive delay was shown to impact both the patient, and the hospital organisation through poor patient flow and loss of potential bed days.

Within the qualitative data, participants described the impact of discharge delay as they perceived it. The theme of patient experience emerged within the data, with participants expressing that when discharge is delayed the patient is let down as they are prevented from returning home, or to a more appropriate care-environment. The impact of discharge delay was also described as cumulative, as when discharge is delayed across an organisation, the overall workload is increased, often resulting in a decrease in the quality of care that is provided. The impact of discharge delay on the hospital organisation was also discussed, with the theme of impaired patient flow consistently emerging. If existing patients are not being discharged, new patients cannot be admitted, meaning both acute and elective patients are prevented from accessing appropriate care in a timely manner. The impact of discharge delay permeates throughout the entire organisation effecting emergency department numbers, theatre schedules, and critical care admissions.

The quantitative data corroborates these findings, demonstrating the impact of discharge delay on patient throughput on the ward. During the two week period 10,185 minutes of delay time was recorded across the 40 patients, equating to a mean

delay of 225 minutes, or 3.75 hours, per patient. Extrapolating these data across a year (with 17 surgical beds and a potential 8,760 bed hours per year) it was demonstrated that if this delay could be prevented, a further 412 days of admission time could be gained, and a potential 200 additional patients admitted to the ward.

Limited literature exists on the quantitative impact of discharge delay. Although several studies have measured the amount of delay occurring across the entire patient journey, few measured the amount of discharge delay that occurred past the point of medical clearance. Two studies included in the literature review utilised a similar study model to this study, by calculating discharge delay based on the amount of time the patient remained in hospital after all medical needs had been met (Cai et al., 2020), or following the determination of medical discharge readiness (Roberts et al., 2018). Of these two studies Cai et al recorded a mean delay of 1.5 days, while Roberts et al recorded a mean delay of 4.8 days. These results demonstrate a markedly longer mean delay time compared to the 3.75 hours seen within this study. Many studies record delay in bed days, rather than in hours, so this is likely responsible for the major difference in times. The populations studied also likely impacted the results, as the patient groups studied by Cai et al., and Roberts et al., trauma patients and neurology patients respectively, typically have more complex discharge needs and more frequently require specialised post-acute care. In comparison, the population of this study was patients admitted to an acute surgical unit where patient are usually discharged quickly, with few discharge needs, and less requirement for post-acute care. Furthermore, these two studies focused on unnecessary bed days spent on the ward recording 15 percent (Cai et al., 2020) and 39 percent (Roberts et al., 2018) of patients as experiencing delay, while this study recorded any amount of time remaining on the ward past the point of medical clearance as discharge delay. This resulted 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. When only significant delay is considered, a delay of greater than 12 hours, this study's results are more comparable, with 7.5 percent of patients experiencing significant discharge delay and a mean delay of 18.2 hours. This is likely a more apt comparison as it is likely that Cai et al. and Roberts et al. did not record time spent post medical clearance less than

12 hours as discharge delay. A comparison of the amount of significant discharge occurring across the studies is summarised in table 4.

Table 4: Significant and mean delay compared to previous studies

Author	% population experiencing significant discharge delay (>12hours)	Mean delay
Cai et al	15%	1.5 days
Roberts et al	39%	4.8 days
The current study	7.5%	18.2 hours (1 day)*

*notes: Given the overnight stay, total time was rounded to one day, or 24 hours.

The literature surrounding the qualitative effects of discharge delay corroborate this study's findings. The effects of discharge delay within the literature were described as bed blocking, overcrowding, and increased acuity and increased operational costs (Affleck et al., 2013; Forero et al., 2011; A. Micallef et al., 2020), higher complication rates (Bai et al., 2019; Covinsky et al., 2003; Covinsky et al., 2011; Rosman et al., 2015) negative patient experience (Everall et al., 2019; Rojas-García et al., 2018) and decreased quality of care (Kuluski et al., 2017). The data demonstrates the impact of discharge delay on both the patient and the organisation. There is serious impetus to solve the problem of discharge delay, however the question remains, how can these delays be best minimised?

6.4 How can discharge delays be minimised in an acute surgical unit?

Discharge delay is a significant issue in acute care. This study explored the potential ways in which systems, protocols, and resources could be improved on or introduced to reduce the amount of discharge delay occurring within the acute surgical unit, and across the acute inpatient setting. Within the qualitative data participants suggested a range of ideas to reduce discharge delay. Interventions related to discharge anticipation included discharge planning, patient and whānau engagement, and the optimisation of the timing of diagnostic tests. Interventions related to medical clearance and the discharge process itself included improving communication and

communication tools, utilising criteria-based discharge or nurse-led discharge, and, most consistently, 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 such as a house officer, discharge coordinator, or a specialist nursing role. Interventions post medical clearance were also suggested such as streamlining transport resources, and optimising transit lounge. This suggests that, as well as addressing the major bottleneck of discharge paperwork and the secondary issue of an ineffective transit lounge, a cohesive, system wide approach to minimising discharge delay is required.

Methods to alleviate discharge delay has been extensively explored through international research over many decades, and was examined in chapter two of this thesis. Several studies have considered approaches directly aligned to those suggested by the participants in this study. These included interventions related to changes in information sharing, the introduction of tools and guidelines, practice changes, and infrastructure changes (Cadel et al., 2021). Successful interventions included introducing a weekend ward round (Almond et al.), establishing a discharge lounge (Hernandez et al., 2014), and discharge anticipation interventions such as prioritisation of diagnostic tests (Khalifa, 2017). Of particular relevance to this study are a series of studies on the function of acute surgical units (Hsee et al., 2012), one of which discusses the role of a nurse practitioner (Cox et al., 2010).

As well as specific examples of discharge interventions, broad discussion of discharge interventions is also present within the literature. Kreindler et al. describe flawed interventions, demonstrating that discharge interventions fail when they focus on too narrow a portion of the patient journey and lack a coherent system wide strategy (Kreindler, 2016). In order to be effective, discharge interventions in whatever form they take, should instead be structured, systematic and coordinated (Carrie Hk Yam et al., 2012).

Part 2: Theoretical contribution

Discharge delay is a system wide issue, its causes are varied and intersecting, and its effects are far reaching. As such, its solution requires a system wide approach that addressed these causes across the patient journey, and prioritises treating the issues causing the most delay. Measuring discharge delay as the time individual patients remain in acute care after their needs have been met places the patient at the centre of the issue, allowing the challenge to be viewed through a patient centred lens. To improve the discharge process' overall efficiency, discharge delay needs to be reduced for individual patients by ensuring that patients are admitted for the right amount of time appropriate to their specific needs. Focusing on 'small' gains per patient will improve patient experience while ultimately translating into significant gains across the organisation, resulting in improved use of resources and better access to these resources for the regional population.

6.5 Patient centred approach to discharge delay

Compared to similar studies, the population examined in this study experienced less discharge delay with an average of 18.2 hours of significant delay, and 3.75 hours of total delay. While only 17 percent of the population experienced significant delay, 100 percent of the population experienced some degree of delay, even if this delay was only an hour. While other studies have focused on significant delay and its effect on bed days, this study focused on hours and minutes, allowing the extent of discharge delay to be seen from a different perspective. From a systems or business perspective, 3.75 hours of mean discharge delay is an acceptable amount. However, when viewed from a patient centred perspective, 3.75 hours of delay is excessive and important to address. Discharge delay is not merely an issue of hospital efficiency but of patient outcomes and experience, therefore, when considering discharge delay the effect on the patient must be front of mind, and for patients any delay is bad delay. A patient centred lens will see the impact that hours of discharge delay has on the individual patient, and, respecting their time, seek to minimise it. All patients will experience some degree of discharge delay as it is nearly impossible for a patient to be cleared for discharge and leave the acute environment simultaneously. However, in order to optimise discharge, these two points of the patient journey must be brought as close together as possible.

The goal of optimising admission length is to ensure that each individual patient is in the acute environment for the right amount of time relative to their individual needs. Therefore, discharge delay should be measured not in average length of stay or in bed days, but in hours and minutes of unnecessary admission time for each individual. Focusing on the time an individual patient is medically clear, the time they leave the acute environment, and the hours and minutes in between these goalposts, results in a patient centred approach to discharge delay because it accounts for the varying needs of patients.

Although in this study, the mean amount of discharge delay was comparatively little, it was a consistent feature across the population. Patients are staying in the acute environment for a mean 3.75 hours longer than they individually require. Patients care about this amount of delay, and so should the hospital system. By pivoting from the classical system focused model of measuring excess bed days, to a patient centred model of measuring excess hours, the patient is prioritised and their time is respected. When systems begin to care about 'small' patient centred improvements such as these, larger improvements will be seen overtime. As demonstrated in this study, eliminating the few hours of discharge delay consistent across all admitted patients would, over a year, allow for approximately 200 more patients to be admitted to just one ward. In the context of a health care system under pressure, where staffing and resources are limited, it is imperative that the resources that are available are used as effectively as possible, and this means caring about comparatively small numbers such as the minutes and hours examined in this study.

6.6 The patient journey optimised for delay reduction

There are several points along the patient journey that should be optimised, as a system wide approach will produce the greatest reduction in discharge delay. A patient journey optimised for discharge is outlined in figure 3. The area circled in orange 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 effectively.

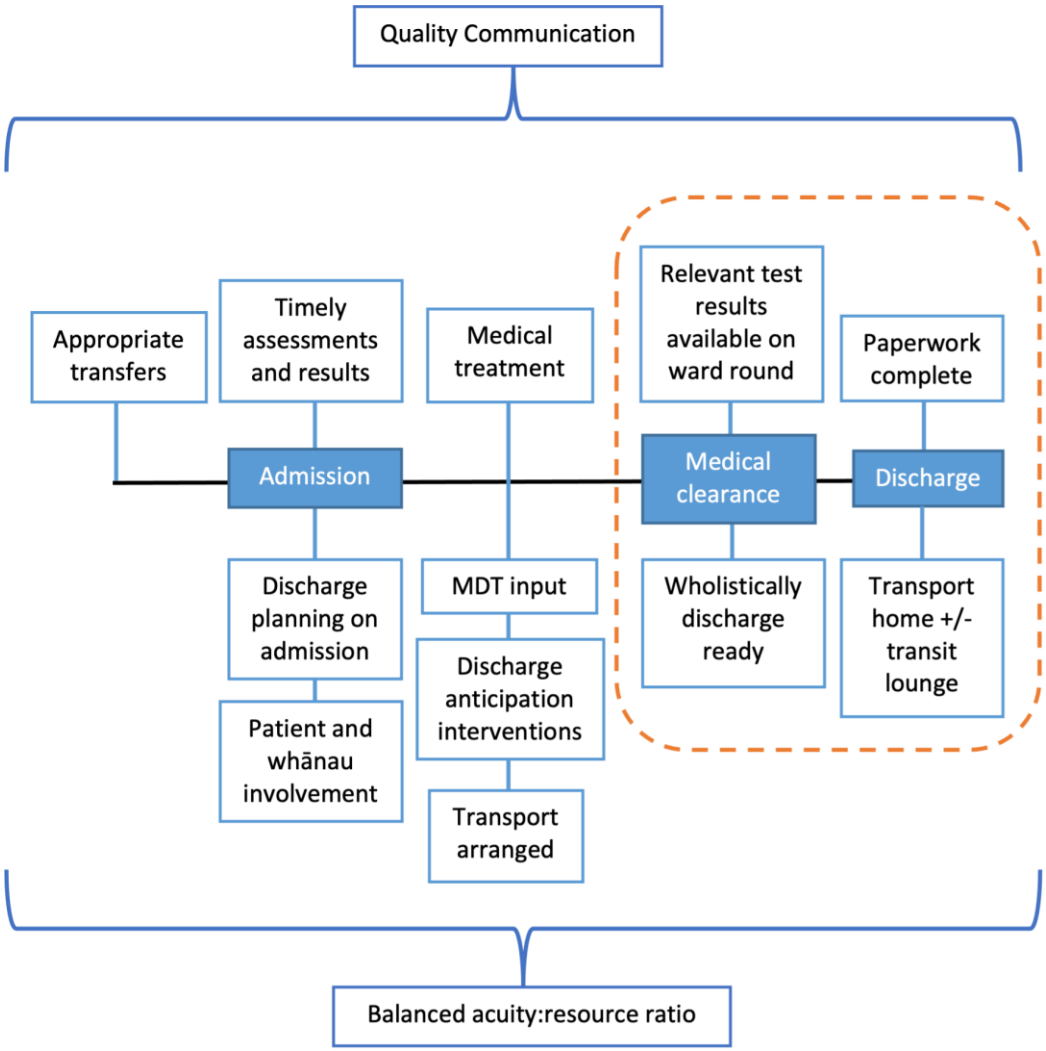

Figure 3: Optimal patient journey

Minimising discharge delay begins before admission by decreasing the amount of inappropriate patient transfers to the hospital. Patients are frequently transferred from outside of Waikato hospitals immediate domicile from primary and secondary hospitals for assessment. A high proportion of this cohort are discharged the following day without progressing to surgery or receiving care that could not have been provided within their domicile. This group are at high risk of discharge delay because once they are cleared for discharge, they must wait for either a family member or another service to transport them home. Refining the process and criteria for the transfer of patients for assessment, as well as increasing assessment and diagnostic

service capabilities at primary hospitals, would reduce the number of unnecessary transfers, and discharge delay would be prevented before it has occurred.

Once patients have entered the hospital system, the admission time period holds many opportunities to reduce discharge delay. Investments made in this time period reduce discharge delay post medical clearance by anticipating discharge requirements and preparing the patient accordingly. The two main areas to address are the timing of initial assessments, and the time at which discharge planning is commenced. Through assessments, medical imaging, and blood tests, patients likely treatment pathway can be identified allowing for discharge planning to be aligned with their estimated discharge. However, the timing of access to these resources, particularly medical imaging, can be a cause of discharge delay when they are required for a patient to be medically cleared. For example, many patients present to the acute surgical unit with abdominal pain and require an ultrasound to determine if they require treatment or can be observed overnight and discharged the following morning. If one such patient presented on a Friday evening, they typically would not receive their ultrasound till Monday morning. If the ultrasound is clear, then the patient is discharged on Monday afternoon when, had they received the ultrasound closer to presentation, their discharge would have taken place significantly earlier. Although this does not directly affect post medical clearance discharge delay, for a proportion of patients it significantly delays the time that they are medically cleared, therefore, increasing diagnostic service availability is worth considering to reduce discharge delay.

Discharge planning, begun on admission and with engagement from patient and whānau, is likewise important to instigate sufficiently early in the admission process. Patient and whānau engagement is essential for ensuring that the patients' needs are understood, their support systems and resources known, and that discharge preparation is carried out in a culturally safe manner. Although discharge planning on admission is widely agreed on in theory, there are challenges to implementing it consistently in practice. Early discharge planning can be challenging to carry out effectively due the overall nursing workload, as the admission period of a patients hospital stay is typically the most demanding in terms of nursing tasks. This effect is especially prevalent when acuity is high and nursing resources are in deficit. The

nursing shift system further complicates discharge planning as, rather than one person continually coordinating discharge planning, the responsibility is handed over every eight hours with inevitable inefficiencies resulting from these repeated handovers. A discharge planning tool could potentially improve the timing of discharge planning being initiated and improve consistency across shifts, however, if the influences of high acuity and staffing deficits are not also addressed, a tool may simply add another form without adding any real value to the system. The root cause of late discharge planning initiation is acuity, staffing, and communication issues. Therefore, appropriate staffing levels, combined with robust handover processes and clear documentation are required to address this issue and reduce discharge delay.

When initial assessments and discharge planning are begun early in the admission time period, discharge requirements can begin to be organised before the patient is medically cleared for discharge. The myriad of assessments carried out on admission inform both the medical care required for a patient to be treated and cleared for discharge, and the wholistic needs that must be met in order for the patient to be safely discharged. Ideally, multi-disciplinary team referrals, discharge location, and transport should all be arranged as early into admission as possible so that once the patient is medically cleared, they are also wholistically ready for discharge. This is not always possible, as patient journeys are not always linear. However, for many admissions, this process is appropriate and should be applied wherever possible.

The medical clearance time period must be addressed as part of a system wide approach to minimising discharge delay. One key way of increasing efficiency within this time period is by optimising blood test result availability. Bloods are usually drawn by the phlebotomists around midday, after the ward round, with blood results available several hours following. This timing is suboptimal as for most surgical patients discharge is dependent on their blood test results. To resynchronise this timing, likely-to-discharge patients should be identified the previous evening, and if their discharge is in part going to be dependent on blood tests, bloods should be drawn at six o'clock in the morning, or the previous evening if appropriate, so that the results are immediately ready for the medical team to review in the morning. Having this information available on the morning ward round allows the team to make an

immediate discharge decision, rather than the patient being for discharge 'pending bloods', which then need to be drawn, their results reviewed and the decision made later in the day.

Once the patient has been declared fit for discharge, the necessary paperwork must be completed; here lies another key area to be improved. Currently, house officers are responsible for completing paperwork. This is usually completed following the ward round, after other higher priority tasks are complete, meaning discharge paperwork is often only begun later in the day, several hours after the patient has been medically cleared resulting in inevitable discharge delay. 'Paperwork' associated delays could be addressed more effectively by the introduction of a 'discharge-focused clinician', who's primary role is to discharge patients. This would result in the protected prioritisation of discharges, allowing discharge paperwork to be completed promptly, significantly reducing discharge delay.

Modifying the existing house officer role by having a different house officer allocated each day of the week to complete discharges for all the general surgical teams would be one way of accomplishing this. However, creating a discharge house officer role would require the reallocation of a surgical team's house officer to the role every day, which would potentially cause resource gaps in other areas. The clinical burden on surgical teams is already high, so merely transferring staff resources rather than adding another clinician may not improve the overall system. If the workload of the other general surgical teams is high, the discharge house officer may be allocated back to non-discharge tasks or be removed from the role and placed back onto a team, which although reasonable, continues the pattern of discharge being deprioritised.

A better solution may be the introduction of a discharge focused clinician in the form of a nurse practitioner. Appointing a nurse practitioner to the role increases available staff resource rather than merely reallocating them from other areas. It would also ensure that the roles core focus was on discharge, allowing it to be prioritised without competition from other clinical tasks. Furthermore, it would likely be a non-rotational role, allowing the clinician to build relationships within the general surgical speciality, and master the role inevitably increasing its effectiveness. Investment into a discharge

focused nurse practitioner for the general surgical specialty would be justifiable, as within the studied hospital there are four general surgical wards including the ASU. As well as improving discharge across these wards, a nurse practitioner would be of immense benefit to the ASU, as they would be able to support patient flow by completing admission assessments, initiating diagnostic tests, and completing minor procedures such as incision and drainages. Although most models utilise a nurse practitioner, a clinical nurse specialist with an extended scope of practice could also be effective. However, in order to improve the discharge bottleneck the clinician in this role must be able to complete discharges independently – if discharges still require signoff or input from a house officer, then delay will still occur. To be able to complete the discharge package independently, the discharge clinician must be able to complete the discharge prescription and thus must have relevant prescribing rights, which may be a potential barrier for a CNS. For this same reason, the deficit here cannot be filled by a discharge coordinator. Although discharge coordinators are invaluable for coordinating complex discharges such as to post-acute care and new rest home placements, this study has demonstrated that these complex discharges are not what is causing the most significant delay in discharge. Thus, a discharge coordinator does not address the true cause of delay, because the role does not include the scope to complete discharge paperwork and discharge patients autonomously.

In addition to the introduction of a discharge-focused clinician, the systems and policies surrounding discharge paperwork must be reviewed. There is much scope for improving the way in which discharge papers are completed, and the populations they are completed for, all of which would increase the efficiency of the process and reduce discharge delay. Currently, discharge paperwork is required for all patients on discharge, however, simple admissions could be given a prescription on the ward round and have the discharge summary completed in retrospect and posted or emailed to the patient. For appropriate patients, this would eliminate paperwork delay by removing the need for paperwork. This would move patients out of the acute environment quickly, however discharge paperwork would still need to be completed at some stage.

The process in which discharge paperwork is completed could also be improved. When patients are admitted to hospital, they are seen by a registrar who hand-writes an admission note containing their presenting complaint, background, the clinical impression, and the immediate plan. A discharge summary includes all the information written in the admission note, as well changes to the plan throughout the admission and the overall outcome of the admission. Because the admission note is handwritten, and the discharge is typed, house officers must manually enter the admission information into the computer programme rather than copying it directly across. If both documents were typed, information could be easily transferred between them which would save time and reduce delay.

Nurse led discharge or criteria-based discharge could also be introduced to support the discharge process. These systems typically involve the patient being cleared for discharge in principle with the paperwork pre-prepared, and then discharged from the ward when the patients nurse deems it appropriate or when specific criteria are met. Instituting a nurse-led or criteria-based system for patients who are likely to become discharge ready out of hours could be an effective was of optimising discharge for surgical patients. This would be especially effective on weekends and outside of work hours, however it again hinges on available staff resource to pre-prepare the discharge paperwork.

Underpinning all these interventions is the need to improve communication, particularly regarding the formatting and clarity of documentation. Improving the clarity and legibility of plans would decrease discharge delay particularly for the cohort of patients who become ready for discharge out-of-hours, as during this time their discharge is dependent on the out-of-hours house officer being able to confidently action the primary teams plan. If communication could be improved in this manner, when a patient become clinically dischargeable they could be safely discharged by the out-of-hours house officer, reducing delay for this population. Communication tools used between health professionals involved in discharge should also be considered. The current pager system used within the study hospital does not enable two way communication, leaving house officers, nurses, and management to communicate inefficiently through the pager process. If a messaging based system was introduced

which enabled rapid two way communication, discharge related conversations would be significantly more efficient, ultimately minimising discharge delay.

Finally, the post medical clearance time period must be improved. A patient may be medically ready, have all their discharge paperwork completed and yet be unable to leave the ward because they do not have transport home. Ideally, patients should not remain admitted to the acute environment while they wait for this transport but should be accommodated in a more appropriate transit lounge service. For this purpose, the hospital in this study has an existing transit lounge service, however it could be better utilised. Not all patients are suitable for transit lounge for reasons such as cognition and mobility, however a significant proportion of the general surgical discharge cohort are. Increasing the proportion of patients who are discharged via transit lounge would significantly decrease the number of medically clear patients waiting in an acute environment to go home; the essence of reducing discharge delay.

6.7 Addressing the discharge delay bottleneck

This series of interventions across the patient journey address a series of factors causing discharge delay. Together they combine into an organisation wide approach to optimising the discharge process and have the potential to significantly reduce discharge delay. However, it is important to acknowledge that not all causes of discharge delay carry equal weight and effect, meaning some are more pressing to address than others. Discharge paperwork has been identified in this study as the most frequently occurring contributor to discharge delay, however its effect is greater than simply its occurrence rate because of its impact on the overall discharge journey. Within the discharge process, discharge paperwork is the final requirement for a patient to leave the acute environment, it is the last step in the 'discharge checklist', 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 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. Figure 4 illustrates the current discharge process timeline, while figure 5 illustrates the effect had on discharge timeframes when discharge is partially optimised without reducing the time taken to complete paperwork.

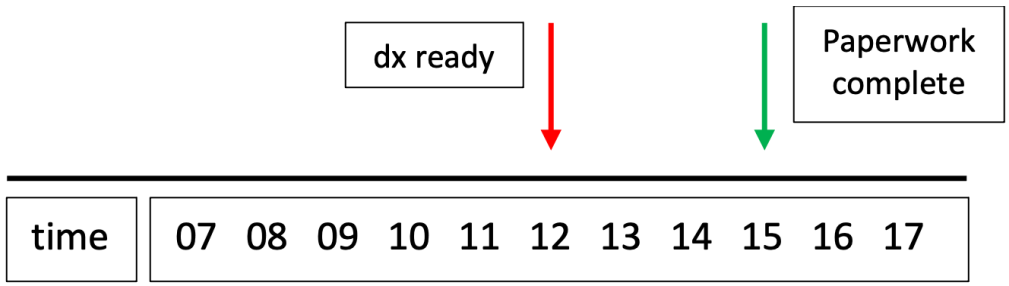

Figure 4: Current discharge timeline

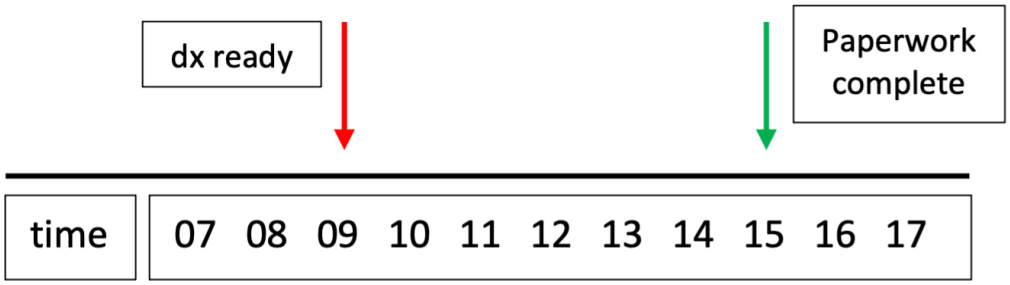

Figure 5: Partial discharge optimisation timeline

When discharge is partially optimised without reducing paperwork completion time, no net reduction in the time the patient can leave the acute environment is achieved, therefore discharge delay is not reduced. Any efficiency gained before the paperwork completion point is lost in the overall discharge time if the time of paperwork completion cannot also be brought forward. However, where the discharge paperwork bottle neck is addressed alongside other interventions, meaningful reduction in discharge delay is achieved. Figure 6 illustrates the effect on discharge timeframes when discharge is completely optimised and the discharge paperwork bottle neck is improved.

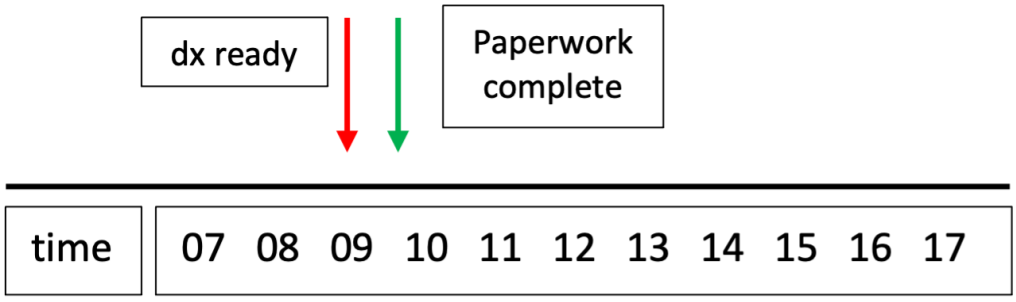

Figure 6: Complete discharge optimisation timeframe

This demonstrates the importance of addressing the discharge paperwork bottleneck as part of a comprehensive approach to reducing discharge delay.

There is no silver bullet to fixing discharge delay, rather an organisation wide focus on improving the discharge process is required. Focused improvements across the patient journey from transfer and admission, through medical clearance, to transportation home, including addressing the key bottleneck of discharge paperwork, have potential to prevent many hours of discharge delay, optimising patient flow, improving patient experience, and enhancing overall hospital function.

Part 3: Limitations, conclusions and implications

6.8 Internal limitations

The study design resulted in limitations in the precision of the quantitative data. The quantitative data was collected by Registered Nurses on the ward about their own discharging patients. Although information regarding how to collect the data and fill out the forms was widely circulated via email, verbally, on posters, and on the form itself, inevitably some inaccuracy in the recorded times is likely to have occurred. Additionally, this 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. For example, a patient's blood tests may be reviewed by a house officer with these results to their senior who then clears the patient for discharge. In this instance the house officer is aware that they have been cleared and that they must discharge the patient, however, the time of this conversation is seldom documented and therefore difficult to record in the data collection. It is possible that situations like this are responsible for the two patients who were recorded as only experiencing 10 minutes or less of discharge delay. It is unlikely, however, not impossible, that these patients were cleared for discharge and discharged within ten minutes. Rather, their recorded 'medically clear' times potentially reflect the time they were given the discharge paperwork and informed that they were medically clear, with their true medical clearance time unrecorded. The nature of the ward involved in the study meant that an audit was the most appropriate data collection option. However, if resources allowed, the researcher being present on the ward at all times 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 Registered Nurses were asked to tick any or all of the factors on the form that had

caused their patient discharge. This 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.

6.9 External limitations

This study took place during 2021 and 2022, during which Aotearoa was navigating the Covid-19 pandemic and its implications on the health system. This external factor changed the way the hospital this study took place in functioned, with resources and systems being slightly different to standard operations. These changes impacted the study primarily by changing the patient cohort present on the audited ward. Due to isolation requirements for patients with covid-19 and staffing deficits due to staff having covid-19, during the time of data collection, patients were frequently admitted to wards outside their speciality. Outlying patients in this way meant that although the audited ward was a general surgical short stay ward/acute surgical unit, patients were admitted to it from a range of surgical specialities, as well as some medical specialties. This meant that the quantitative data collected was less specific to general surgical short stay patients, as originally intended.

Covid-19 also exacerbated staffing deficits across all areas of health. This also likely impacted on the data, as delays were likely extended due to staff resourced being stretched.

6.10 Conclusions

Optimisation of patient discharge is essential as it impacts both the patient and the entire health system. Patients should be discharged as close to the time they are declared medically stable and safe to leave the inpatient environment as possible. A significant body of work exists which explores the many facets of optimised patient discharge, however there is little existing research on discharge delay from acute surgical units. This study sought to fill this 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, which over a two week time period, recorded a mean delay of 225 minutes, or 3.75 hours, per patient. For the audited patients, 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; a system wide focus on discharge across the entire patient journey with particular focus on the bottleneck of discharge paperwork.

6.11 Practice and Policy implications

To reduce discharge delay, a coordinated system wide approach is required with optimisation across the entire patient journey. Within this series of interventions, the most pressing is to decrease the amount of delay caused by discharge paperwork. Although the causes of discharge delay are many and varied, the most significant bottleneck responsible for delaying discharge is the completion of discharge paperwork. The problem of paperwork could be addressed most effectively by the introduction of a 'discharge-focused clinician', who's primary role is to discharge patients. This would result in the protected prioritisation of discharges, allowing discharge paperwork to be completed promptly, thus significantly reducing discharge delay. In addition to the introduction of a discharge-focused clinician, the systems and policies surrounding discharge paperwork must be reviewed. There is much scope for improving the way in which discharge papers are completed, and the populations they are completed for, all of which would increase the efficiency of the process and reduce discharge delay.

Additionally, improving the utilisation of transit lounge will also reduce discharge delay. Optimally, all appropriate patients who are ready for discharge should be discharged via transit lounge rather than waiting in the acute care setting when they no

longer require acute care. Within this study, consensus was not reached on which patient groups are appropriate for transit lounge, with some arguing that only patients who have discharge paperwork complete should be sent to transit lounge, while others felt that paperwork could be completed while they wait in transit lounge. However, regardless of the parameters decided on, routinely sending all appropriate patients to transit lounge to wait for their transport, is a key means of reducing discharge delay.

6.12 Future research

This research has laid the foundation for further research into discharge delay. The acute surgical unit model is increasingly being introduced to hospitals. Further research into discharge delay within these units would be useful as efficient patient flow is one of the primary goals of an acute surgical unit. A comparison of studies across multiple centres would also be of benefit as it would assist in developing an optimal model that could be standardised across hospitals, especially in light of the recent unification and consolidation of New Zealand's hospitals under Te Whatu Ora. This research is of significant benefit to the acute surgical unit studied, however its findings and thus its recommendations may not be applicable to other patient groups. Extending the studied population to a broader cohort of patients, the entire surgical cluster for example, may provide a richer understanding of discharge delay which may be of more benefit for overall hospital policy. In addition to this, if some or all of the recommendations within this study were to be implemented, a post-intervention study would be beneficial to measure the impact of the intervention.

Finally, this research highlighted the gap in existing literature on the impact of health inequity on discharge, and on discharge delay. Further research into differences in experience and outcomes across different ethnicities and socioeconomic statuses could provide insight into how health inequity effects discharge, which is important to understand in order to develop appropriate and inclusive policy.

Appendices

Appendix 1: University of Waikato Ethics permission

The University of Waikato
Private Bag 3105
Gate 1, Knighton Road
Hamilton, New Zealand

Human Research Ethics Committee
Roger Moltzen
Telephone: +64021658119
Email:humanethics@waikato.ac.nz

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

27 May 2021

Jolene Jones
Te Huataki Waiora - School of Health
DHECS
By email: jovoogt123@gmail.com

Dear Jolene

HREC(Health)2021#31 : Keeping it short and sweet; an exploration into discharge delays amongst acute surgical admission patients

Thank you for your positive response to our feedback and your detailed amendments.

We are now pleased to provide formal approval for your project.

Please contact the committee by email (humanethics@waikato.ac.nz) if you wish to make changes to your project as it unfolds, quoting your application number with your future correspondence. Any minor changes or additions to the approved research activities can be handled outside the monthly application cycle.

We wish you all the best with your research.

Regards,

_____

Emeritus Professor Roger Moltzen MNZM
Chairperson
University of Waikato Human Research Ethics Committee

Appendix 2: Te Whatu Ora – Waikato Ethics permission

Te Puna Oranga Māori Research Review Committee

2 March 2022

Re: Māori Consultation for 'Keeping it short and sweet: an exploration into discharge delays amongst surgical admission patients'

Name of Applicant: Jolene Jones

Tēnā Koe Jolene,

Thank you for submitting the above research proposal to the Waikato DHB Te Puna Oranga Māori Research Review Committee for Māori consultation. The research application has been reviewed in order to support and prompt the researcher to think about how this research will improve health outcomes and eliminate inequity for Māori living within the Waikato DHB region.

1. The Committee acknowledges the researchers for collecting ethnicity data as part of a demographic background of the participant to improve data collection for Māori in order to improve Māori health outcomes and reduce inequity for Māori.

2. The Committee encourages the research team to actively recruit equal numbers of Māori and Non-Māori. Any Research that involves Māori participation would require sufficient face to face time for fully informed consent to occur. Inclusion of the whānau of the Māori participant should be encouraged to support the continued engagement of the Maori participant in the research process.

3. The Committee encourages all research that involves participation of individuals, especially Māori participants to fully inform them regarding the detail of tissue collection. One consent form for the current use of Tissue. One consent form for the future use of tissue (this should be clear to the participant).

4. Studies using retrospective data must respect Maori data as outlined in Te Mana Raraunga: ***5.1 Respect***. *The collection, use and interpretation of data shall uphold the dignity of Māori communities, groups and individuals. Data analysis that stigmatises or blames Māori can result in collective and individual harm and should be actively avoided.*

   Reference: Te Mana Raraunga: Principles of Māori Data Sovereignty. Brief #1 | October 2018. https://static1.squarespace.com/static/58e9b10f9de4bb8d1fb5ebbc/t/5bda208b4ae237cd89ee16e9/1541021836126/TMR+Ma%CC%84ori+Data+Sovereignty+Principles+Oct+2018.pdf (Accessed August 2019)

5. If cultural issues arise for the Māori participant during any research, they will inform the research team during the study that an issue has occurred. Cultural issues may not be obvious to the participant or the researcher prior to commencement of the research.

6. The Committee encourages the research team to continue to consult with Te Puna Oranga, Māori Health service at any time, should they have any further queries.

7. Feedback regarding this research is appreciated and can be shared back to the Kaunihera Kaumatua via Te Puna Oranga Māori Health Service

The Committee endorses this research proposal with the consideration of the above cultural recommendations where appropriate and requests the researcher to collect ethnicity data for all study participants seen at Waikato DHB for our own internal records.

Dr Nina Scott
Te Puna Oranga-Maori Health Service

Appendix 3: Audit form page one

Discharge delay audit

Jolene Voogt

Background and instructions

- This audit aims to gather information about the amount of discharge delay occurring on M18, as well as the causes of the delay.
- For this study, discharge delay is defined as the period of time between when the patient is cleared for discharge and the time that they physically leave the ward.
- By measuring these times and identifying the delaying factors that happened during this time period, hopefully the discharge process will be able to be improved!
- Please fill out this audit form by ticking the boxes that applied to your patient and adding any extra reasons for discharge delay that you observed.
- This needs to be completed for every patient that discharges.
- I know filling out forms is not the most fun, so please take a chocolate for every form you complete and enjoy the satisfaction that you are contributing to research and improving your workplace
- If you have any questions at all please either ask myself, Jane, Emma or Beth ☺

Thanks so much!!!

Appendix 4: Audit form page two

Patient name:		**Date:**	… / … / 2022
Time patients cleared for discharge: Instructions: *If the patient is cleared for discharge on the ward round, the ACNM on the round will fill this in, if no one was on the round, please just fill in the time noted on the ward round note. If the dx decision was made later in the shift, please note down the time the decision was made by the team and communicated to you.*			
Time off the ward, please note the time the patient physically left the ward: Instructions: *Note, if a patient is waiting in the ward lounge prior to discharge, please record the time the patient actually exits through the ward door. If they are going to be discharged from transit lounge, note the time the attendant leaves the ward with them* ☺			

Please tick the following boxes if any categories applied to your patient and caused their discharge to be delayed in the time after they were cleared for discharge. You may tick more than one box.

Administrative issues	Waiting for discharge paperwork (e.g. Prescription, summary, med cert etc.)		Waiting for care facility to accept transfer (e.g to ARC, supported accommodation, or other DHB)	
	Difficulties moving patient to transit lounge (e.g., waiting for attendant)		Waiting for post-acute bed (e.g. Con care, OPR, RnR)	
	Waiting for transport (e.g. family member to pick up, waiting for attendant to take to carpark etc.)		Communication issues (e.g. Unable to contact HO, unclear plan)	
	House officer availability (e.g. house officer at medical emergency, unavailable to write paperwork)		Other (please specify ……)	
Further clinical review:	Further medical review required, other than primary treating team (e.g. Cleared for discharge by Gen Surg but need input by ID or Cardiology etc. Please specify which team ……)		Review required by OPAL / DSL / START	
	Further nursing review / input (e.g. wound CNS, Diabetic CNS etc. Specify service ……)		Other (please specify ……)	
Allied health	Further PT input required (e.g. PT clearance, gait, concern over falls risk)		Further SW input required (e.g. accommodation needs, needs assessment)	
	Further dietitian input required (e.g. needs education, equipment)		Further OT input required (e.g. OT clearance, waiting for equipment)	
Concern	Pt concerns about discharge (e.g. patient Does not feel ready, dissatisfied with plan, wants to see team before discharge)		Family concerns about discharge (e.g. feels patient will not cope at home, dissatisfied with plan, wants more support):	
	Patient deterioration (e.g. bloods returned worse, pain increasing, had a fall)		RN concerns about discharge (e.g. RN expresses concern over patient condition)	
other				

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