How to build excellence in cardiac care: Nurses On the Ward round (NOW)

By

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KEYWORDS

Cardiac nursing; Cardiology; Culture; Delays; Excellence; Effective decision making; Multimethod; Directed acyclic graph; Nursing surveillance; Quality patient care; Re-engineer; Situational awareness; Thematic analysis; Ward round

LIST OF ABBREVIATIONS

ACORN	Australian College of Perioperative Nurses
ACS	acute coronary syndrome
AF	atrial fibrillation
ARR	arrhythmia
ATS	admissions transfer system
cath lab	catheterisation laboratory
CCU	cardiac care unit
COVID-19	Coronavirus Disease
DAG	directed acyclic graph
ECG	electrocardiogram
echo	echocardiogram
eMar	electronic medication administration record
EMR	electronic medical record
HFS	heart failure service
Hr/med	hours per medication
ICU	intensive care unit
IDC	indwelling urinary catheter
IQR	interquartile range
min	minute
MRI	magnetic resonance imaging
NHS	National Health Service (England)
NIMC	National Inpatient Medication Chart
NSTEMI	non-ST-elevation myocardial infarction
NSW	New South Wales
PI	primary investigator
PICO	population, intervention, comparator, outcome
RMO	resident medical officer

RN	registered nurse
rv	review
SA	South Australia
SALHN	Southern Adelaide Local Health Network
SD	Standard Deviation
SSA	site-specific application
STEMI	ST-elevation myocardial infarction
TDF	theoretical domains framework
W	withhold
WOW	workstation on wheels
WR	ward round

ABSTRACT

Background: There is limited literature investigating effective mechanisms for improving clinical team cohesion and effectiveness to achieve clinical excellence in cardiology.

Purpose: To re-engineer cardiac care unit (CCU) ward rounds to enhance the input and advocacy of cardiac-trained nurses to improve decision making and deliver patient-centred care. Then to measure whether any of these structural changes have impacted ward round culture and the timely delivery of patient care after 1 year has passed.

Methods: A multimethod approach was applied to both studies to measure primary and secondary endpoints as well as patient satisfaction. Staff were engaged with initial questionnaires and followed up with interviews to assess their attitudes and compliance with the ward round design. Research methods were:

Study 1: A prospective observational design, ensuring CCU nurse attendance at every ward round (i.e. arrhythmia, acute coronary syndrome and heart failure streams) in consecutive 2-week control and implementation periods, conducted over three 4-week cycles. The primary endpoint was timely administration of cardiac medications. Secondary endpoints were length of stay; time to procedure bookings; patient mobility; and education.

Study 2: An observational design measuring primary and secondary endpoints to determine sustainability of the initial ward round study, 1 year after the intervention.

Results: Study 1: 197 patients were recruited (control n=99, intervention n=98, with a total of 206 episodes of care (control n=101, intervention n=105). Median time to cardiac medication administration was significantly shorter in the intervention cycle (intervention: 0 hr/med [IQR 0–0.5] versus control: 0.2 hr/med [IQR 0–1.2]; p=0.012). Heart failure patients had the most significant improvements (intervention: 0 hr/med [IQR 0–0.03] versus control: 0.9 hr/med [IQR 0.3–1.6]; p<0.001). Secondary endpoints trended towards improvement in all ward rounds, but results did not reach statistical significance.

Study 2: Electronic Medical Records of 115 patients were reviewed 1 year after Study 1 was undertaken. There was no evidence of sustained improvement in the primary and secondary endpoints. For all streams combined, median time to cardiac medication administration was 0.11 hr/med (IQR 0–1.84) in the follow-up study versus 0 hr/med (IQR 0–0.5) during the

intervention. Improvements among heart failure patients were not maintained either (follow-up study: 0.09 hr/med [IQR 0–1.05] versus intervention: 0 hr/med [IQR 0–0.03]). A thematic analysis of interviews with six cardiac nurses and seven doctors showed that nurses want to be on the ward round, and that doctors want and value cardiac nurses' knowledge and expertise on and off the ward round. Six themes were identified; trusting and respectful relationships, teamwork, presence of expertise, and the expectations that doctors and nurses place upon themselves and each other. As well as the need to reduce workload barriers to optimise effective decision making on the ward round. Other subthemes such as; nurse surveillance, situational awareness, workplace culture and leadership helped to create a thematic map that includes a new nursing model. This study showed that a culture of trust and respect already exists between senior medical and nursing staff. Communication and workload issues are preventing their ability to function as a team. Therefore, the concept of cardiac nurse streaming, a new nursing model, has been suggested as a positive practice change that can ensure cardiac patients receive timely quality care all the time and contribute to building a centre of excellence.

Conclusion: Enabling CCU nurses to regularly attend ward rounds and contribute to effective decision making reduced medication delays, with clinically valuable improvements in secondary endpoints observed. Improvements were not maintained 1 year later, and CCU nurses still struggled to attend ward rounds. Further research into implementable, scalable and sustainable interventions, such as cardiac nurse streaming, is essential to drive clinical excellence. Nurses belong on the ward round.

LIST OF ACHIEVEMENTS

Publications

1. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. (2023). Patients need us NOW (Nurses On the Ward round): Investigating the impact on patient outcomes when cardiac nurses attend the cardiac unit ward round; future implications. *European Journal of Cardiovascular Nursing*. Publication for submission late 2024.

Presentations

1. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. (2022, August 8–10). *Re-engineering the cardiology ward round to improve efficiency in care* [Oral presentation]. Australasian Cardiovascular Health and Rehabilitation Association (ACRA) Annual Scientific Meeting, Gold Coast, Queensland, Australia.

2. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. (2022, October 28). *Re-engineering the cardiology ward round to improve efficiency in care* [Poster presentation]. South Australian Health and Medical Research Institute (SAHMRI) Cardiovascular Showcase, Adelaide, SA, Australia.

3. Lymn, A. (2022, November 16). *Re-engineering the cardiology ward round to improve efficiency in care: A nurse in the room* [3 Minute Thesis (3MT) competition, oral presentation]. South Australian Health and Medical Research Institute (SAHMRI) Research Showcase, Adelaide, SA, Australia.

4. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. (2023, March 31–April 1). *Re-engineering the cardiology ward round to improve efficiency in care* [Poster presentation]. Australasian Cardiovascular Nursing College Symposium, Sydney, NSW, Australia.

5. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. *(2023, June 23–24). Re-engineering the cardiology ward round to improve efficiency in care* [Moderator, Poster prize session]. European Society of Cardiology: Association of Cardiovascular Nursing and Allied Health Professionals, Annual Scientific Meeting, Edinburgh, Scotland.

Awards

Presentations

1. Lymn, A., & Nuske, A. (2022, October 9). **3 Minute Thesis (3MT) finalist:** *Tips for success, interview, and presentation* [Oral presentation]. 3 Minute Thesis (3MT), Flinders University, Adelaide, SA, Australia.

2. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. (2022, August 11–14). **Finalist in new investigator poster prize session:** *Re-engineering the cardiology ward round to improve efficiency in care* [Poster presentation], Cardiac Society of Australia and New Zealand (CSANZ) Annual Scientific Meeting, Gold Coast, Queensland, Australia.

3. Lymn, A. (2022, August 26). **3 Minute Thesis (3MT) semi-final competition, winner:** *Re-engineering the cardiology ward round to improve efficiency in care: A nurse in the room* [Oral presentation]. 3 Minute Thesis (3MT), College of Nursing and Health Sciences, Flinders University, Adelaide, SA, Australia.

4. Lymn, A. (2022, September 9). **3 Minute Thesis (3MT) final competition, finalist:** *Re-engineering the cardiology ward round to improve efficiency in care: A nurse in the room* [Oral presentation]. 3 Minute Thesis (3MT), Flinders University, Adelaide, SA, Australia.

Conference grant applications

1. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. *Re-engineering the cardiology ward round to improve efficiency in care*, **Successful Overseas Travel Grant Application**, Value $3830.00, Flinders University, Adelaide, SA, Australia, 23–24 June 2023.

2. Lymn, A., Clark, R., Lambrakis, K., & Chew, D. *Re-engineering the cardiology ward round to improve efficiency in care*, **Successful Conference Registration Grant Application**, Value $535.00, European Society of Cardiology: Association of Cardiovascular Nursing and Allied Health Professionals, Edinburgh, Scotland, 23–24 June 2023.

Refer to Appendix 1 for more details regarding further thesis activities over the last 3.5 years

DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any university; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Anita Lymn

Signed

Date 14/11/2024

ACKNOWLEDGMENTS

Following 30 years of cardiac nursing, I saw many of my colleagues retiring early or leaving the cardiac care unit to find a less stressful environment to work in. I did not want my future knowledge, experience and cardiac nursing skills to eventually disappear into the retirement bubble without leaving some of myself behind for others to follow. That is my utmost respect and admiration for the cardiac nurses I have worked with over the years and the number of times I have observed how much work they do to improve patient outcomes. Over the years, I have watched cardiac nurses teaching doctors, nurses and patients, as well as delivering a culture of teamwork so that the best possible nursing care is provided to our patients, whilst nurturing our nursing and medical staff through their clinical placements in our cardiac unit.

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To my family, I am grateful for your patience and support. My mother showed me how to work hard and believed that I could always achieve anything I wanted in life. Her love surrounded me until she passed a year after I commenced my PhD. Thank you, Mum. My husband, Evan, and two daughters, Monique and Claire, continue to surround me with the love and support I need to complete this thesis. I promise, the house will be clean and tidy one day and I will return to cooking those gourmet meals. As to the washing and ironing, Evan truly does a better job than I. Thank you my darling husband and my beautiful girls.

Finally, I want to express appreciation for the new skills and confidence I have achieved throughout this process. This clinical PhD has provided the opportunity to step back and reflect on evidence-based practice, leadership skills, workplace culture and delivering excellence in healthcare. I have improved my ability to analyse situations, then communicate and collaborate with my peers and hospital leaders. I now communicate and meet with divisional and executive leaders, putting forward my ideas and the plight of cardiac nurses as they try to deliver optimal care to our cardiac patients. So, with this thesis, and the future publications that will come from this work, others will see the value of cardiac nurses and how much they contribute to improving the care and outcome of cardiac patients when given the opportunity to do so. Nurses are the key to creating excellence.

Thank you.

CHAPTER 1. INTRODUCTION

A patient admitted to hospital will have contact with a nurse 24 hours a day. The nurse is continually assessing their patient and adapting care in response to changes in the patient's condition and their individual social, emotional, spiritual and physical requirements (Halverson & Scott Tilley, 2022). Nurses accumulate independent clinical knowledge about their individual patients as they interact with them. As a nurse gains more clinical expertise, they are able to make more effective clinical decisions that will prevent or adapt to a patient's clinical deterioration (Benner, 1984). Doctors, however, mostly see and speak to a patient once or twice a day to assess the patient's condition, and make clinical decisions and patient treatment plans without a nurse's input. Doctors rely on nurses updating them on changes in the patient's condition and patient needs so that the doctor can prescribe optimal individual patient treatment plans. Therefore, when doctors and nurses, particularly qualified, advanced and experienced nurses, work in an environment that optimises a culture of communication and collaboration between these two healthcare teams they can improve quality patient care delivery (Arzani et al., 2016; Lockhart-Wood, 2000). Also the role of nurses is growing globally as they expand their scope of practice applying their expert skills to advocate, assess and interact with the patient and the multi-disciplinary health care team, (Chapple et al, 2018 Farwaz, 2021, Beks et al, 2023). Research has shown that the delivery of expert nursing care does improve patient outcomes and it is cardiovascular nurses that are leading the way in both clinical, leadership and research positions, especially in Australia, (Hendriks, 2022, Ferguson et al, 2020). Nurses, from those at the bedside to those with senior expertise, need to be empowered and provided with more opportunities to make clinical patient care decisions that influence the patient's care journey, (Birks et al, 2019). The ward round is the perfect situation for this to occur. This thesis will explore the benefits of having nurses on the ward round, both for the delivery of efficient patient care and for their influence on patient involvement and teamwork culture that will contribute to creating a centre of excellence.

Nurses are recognised as the backbone of the healthcare system, but little is known about the true extent of nurses' input into clinical decision making within the ward round team. Nurses attempt to keep patients and medical staff informed of changes in the patients' condition throughout their shift and, therefore, influence treatment plans and thus the patient's healthcare journey (Krairiksh, 2000). The primary investigator in the research for this thesis, a cardiac-trained nurse

with over 30 years of experience, is taking the opportunity to investigate how nurses influence the behaviour of the Cardiac Care Unit (CCU) healthcare teams to create a culture of excellence. Each member of the cardiac, medical healthcare teams, as well as the patient, is influenced by a nurse's presence on the ward round, and all are working towards the delivery of timely and quality patient care. Unlike previous research, this study will use some alternative qualitative and quantitative findings to understand how nurses affect timely delivery of patient care, as well as the ward culture required to maintain quality patient care.

Where possible, patients should be actively involved in making decisions about their care. Nurses play a crucial role in ensuring patients have realistic expectations of ward rounds and receive and understand all the relevant information about their care. Ward rounds are a crucial aspect of acute care, but nurses' involvement varies (Manias & Street, 2001; Weber et al., 2007). Despite this variation in nurses' responsibilities on ward rounds, nurses have a vital role to play, particularly in patient advocacy for clinical care, and should make it a priority to be core active participants (Desai et al., 2011). Unfortunately the primary investigator observes a lack of nurses participating in the three major cardiac team ward rounds that occur Monday to Friday within a 20 bed Cardiac Care Unit.

This thesis presents cardiac nurses as fundamental members of the multidisciplinary cardiac ward round team. Cardiac nurses are trained and highly skilled in delivering quality patient care for the acute cardiac patient requiring expert nursing in the CCU, (Ferguson et al., 2020). Currently, medical and nursing teams are working in silos, creating problems with misaligned clinical decisions causing delays in the delivery of patient care. This is because nurses cannot attend the full CCU ward round, reducing their opportunities to advocate for patients and communicate and collaborate with the medical ward round team. These cardiac nurses are busy following other hospital priorities such as patient flow and delivering direct patient care. This is workflow is reflected in many other ward round observations around Australia and the world, (Garling, 2008, Zwarenstein et al, 2013, Clay-Willians et al 2019, Aiken et al, 2017). In this CCU, the organisation did not provide the environment for nurse participation on the three cardiac ward rounds. This challenge mirrors findings from German healthcare institutions where Foth et al, (2015), highlights that nurses are frequently unable to collaborate effectively with physicians due to conflicting demands on their time. The organisation was not prioritising face to face conversations between doctors and nurses. Therefore, this thesis proposes implementing cardiac nurse

streaming, nurses belonging to each cardiology ward round team, as an option to improve the timely delivery of quality patient care.

This multidisciplinary approach implies that improved doctor and nurse collaboration and communication will lead to better teamwork, and a culture that promotes trusting, respectful and professional relationships where staff feel they belong to a team and can contribute to patient care decisions (Steward, 2023). However, the current organisational workplace culture in this study does not necessarily foster nurse empowerment or the freedom to contribute ideas and knowledge to innovate or make clinical decisions, even though CCU nurses have been highly trained in acute cardiac nursing. This is because they were prevented from contributing to clinical decision making on the ward round. Many CCU nurses were resigning at the time as activity levels were high and bed demands were stretched. See appendices 21 to 23 showing changes to bed demands and nursing staff levels, that led to a stressful working environment. This is discussed in more depth in Chapter 5.

Reese et al, (2021) reminds us to be mindful about providing job satisfaction for nurses and recognising the efforts they make to provide quality patient care as well as including them in the decision making process. This is reinforced by Baek et al's,(2020) workforce analysis highlighting not only the importance of nursing ratio's but also collegial relationships between nurses and doctors. Therefore, restructuring the ward round, to include nurses, is potentially a way to foster an environment where cardiac nurses can work to their full scope of practice.

Because ward rounds are complex, the ward round intervention in this PhD focused on team culture by addressing communication and collaboration barriers between doctors, nurses and patients. We did not evaluate the lack of organisational support nor include the benefits of organisational change theory in this thesis. Instead, we measured the timely delivery of key clinical activities to ascertain the effectiveness of decision making during and outside of the ward round. Fewer delays in the administration of cardiac medication was considered a marker for an improved culture where doctors and nurses participate in joint effective decision making. A ward round culture that supports cohesive teamwork also enabled patient inclusion so that other key clinical activities, such as fasting, length of bed rest and delivery of patient education, improved.

The ultimate goal of this research was to create a component of a centre of excellence by translating the research into daily practice where nurses were always present on all three of the CCU ward rounds. We wanted to create a ward round intervention that provided more face to

face interactions between doctors, nurses and patients and see if this affected decision making, so incorporated a directed acyclic graph and behaviour change theory into our conceptual framework.

Following the initial ward round study described above, we went on to measure ward round structures and key clinical activities 1 year beyond the initial study. This follow-up study aimed to discover how well we had translated this research into practice to maintain a ward round team where doctors and nurses, together with the patient, continued to make effective decisions that provided consistent quality patient care. In this case, quality was measured not only in timeliness of care delivery, but also in patient and staff feedback. Improvement in the quality of patient care and teamwork was considered an indicator that the CCU was providing excellent patient care.

In summary, our objectives were based on the development of an intervention for ward rounds that enhances interactions among doctors, nurses and patients, and to measure the timely delivery of patient care, by ensuring nurse ward round attendance. We also wanted to know if timely delivery of patient care can be sustained one year later when it was still unlikely that nurses could attend the ward round. We aimed to assess whether these direct interactions influences decision-making processes and improves overall patient inclusion and care and to identify mechanisms that support a sustained culture of excellence. This thesis will therefore present the initial ward round study and the 1-year follow-up data explaining the mechanisms that were effective and the challenges we faced in building a centre of excellence.

1.1. The CCU ward round

The daily ward round is an opportunity for the team of doctors and nurses to communicate and collaborate about patient care (Verhaegh et al., 2017). However, over the years, the lack of hospital management support for nurses attending the ward round, the workload, staffing and structural complexities in the CCU have eroded the ability for cardiac doctors and nurses to attend the ward round together, a common thread in many other hospitals (Cohn, 2013). This project provided the opportunity to examine the influence of current ward round structures on direct patient care and clinical decision making. Restructuring the ward round offers a quality improvement strategy for teamwork between CCU doctors and nurses, which in turn may improve patient care and has leadership opportunities that could empower doctors and nurses to make good clinical decisions and improve communication and collaboration. Availability of cardiac-trained nurses to attend the ward round should have a positive effect on patient care as these

specialised nurses are given the opportunity to drive the quality improvement process (Currey et al., 2019; McHugh et al., 2013). Therefore, this study implemented changes to the CCU ward round aimed at improving the culture of teamwork between cardiac doctors and nurses and, ultimately, improving the delivery of patient care (Desai et al., 2011).

1.2. The problem to be addressed in this study

Cardiac streaming is a strategic project, introduced in 2014, that focused on teamwork and improving patient outcomes for cardiac patients in Flinders Medical Centre. An alternative to the acuity-based model of cardiology unit allocation, cardiac streaming divides cardiac patients into three condition-based cardiology subcategories: acute coronary syndrome (ACS), arrhythmia (ARR) and the heart failure service (HFS). Medical staff work with a consistent group of patient presentations, which, at the time, resulted in "productivity gains", "reduced length of stay and provided short term outcomes" (Chew, Horsfall, et al., 2016). However, this was a medical model that was not adopted and supported by the hospital nursing department. This meant that nurses were not included in the cardiac stream ward rounds, a culture shift for the senior cardiac nurse coordinators. It was also more difficult for the one nurse coordinator to attend all three cardiac stream ward rounds. Although in the early years of cardiac streaming there was an attempt to stagger each stream and have the nurse unit manager attend the shortest stream round, intermittent nursing attendance at ward rounds is not an ideal way of promoting a cohesive team.

Since cardiac streaming was first implemented, the CCU workload has increased and we are now met with increasing demands on hospital beds, putting extra pressure on nurses' and doctors' ability to make effective decisions (Zavala et al., 2018).Refer to Appendix 21 to 24 to see bed demands, staffing ratios and admission and discharge activity levels. As well as this, CCU nursing staff attrition rates have increased, reducing the number of senior cardiac nurses available to supervise junior and non-cardiac-trained nurses each shift. This is because many experienced cardiac nurses chose to retire early or seek alternative employment outside of CCU and or the hospital at this time. It became increasingly difficult to recruit cardiac-trained nurses to replace those that have left. This issue is reflected in various studies around Australia and globally, (Aiken et al , 2017, Conroy et al, 2017, McHugh et al, 2021). To attract and retain high-calibre staff we need to address quality improvement and work on promoting the cardiology department's reputation as a centre of excellence (Elrod & Fortenberry, 2017).

Currently, there is only one CCU cardiac nurse co-ordinator available for the ward round. Because each of the three cardiac streams perform their own individual ward rounds for their allocated patients, it is not possible for a cardiac nurse to attend all three streaming ward rounds when they occur simultaneously. Each cardiac stream is allocated a group of senior and junior doctors. They all have a cardiologist, a registrar and a resident medical officer (RMO). An intern is also allocated to the ACS and HFS streams. The stream cardiologist changes every week and does not always see all the CCU patients. See appendix 23. The registrars and junior doctors catch up seeing all the patients throughout the day and swap their stream every 4 weeks. Dealing with 11 doctors coming and going in CCU Monday to Friday, who regularly change their streams, may contribute to communication and decision-making deficiencies including nurses being unable to participate in bedside decision making, reduced nursing and medical collaboration, missing information, lack of patient involvement in their treatment plan, and delayed and batched decisions. The compliance figures in chapter 4, section 4.6.1 highlight a shift towards ad hoc behaviour later in the patients' admission. During the 12-week intervention period, adherence to ward round procedures was measured. It was observed that both doctors and nurses were not fully adhering to the intervention and were reverting to previous practices as mentioned above.

Therefore, this thesis proposes the eventual introduction of a multidisciplinary model of cardiac streaming in which each stream team includes a senior cardiac nurse with the clinical expertise, knowledge and skill to contribute to effective decision making. This will be called cardiac nurse streaming.

1.3. Current practice for ward rounds in the cardiology ward

1.3.1. Decision making

The origins of this thesis lie in the desire to improve the delivery of timely, quality patient care in the CCU through better teamwork between CCU doctors and nurses. The process of making clinical decisions in acute care involves multiple factors, including rapid assessment of patient conditions, integration of complex information, and balancing various treatment options. Research discussed by Berg & Bittner,(2019) and Collet et al, (2021) highlights how both the accuracy and timeliness of these decisions directly affect the quality of patient care. Timely and accurate decision-making is crucial in acute care settings. Delays or errors in decisions can lead to worsened patient outcomes. Ensuring that clinical decisions are both precise and prompt is essential for high-quality care delivery such as door to needle times for ST elevation myocardial infarction, and

stroke therapy (Collet et al, 2021 & Donaghy et al, 2019). However, not all patient care is an emergency but day to day treatment plan decisions need to be made during the patient's stay in hospital. It was The Royal College of Physicians that developed ward round guidelines aimed at improving decision-making processes and ensuring timely patient care (Royal College of Physicians, 2021a, 2021b). These guidelines have been adopted by NHS hospitals to standardize practices, enhance communication, and streamline the decision-making process.

This researcher perceived deficiencies in medical and nursing decision making were contributing to patient care delays through her observation of the ward round. The research nurse, raised concerns about medical decision making included having to wake CCU patients up at midnight to administer catch-up doses of cardiac medications with her supervisors. Patients were also observed by the research nurse to be fasting for procedures that sometimes were not even booked, or the booking was made late in the day and the patient was cancelled and rebooked for the following day. The research nurse also observed that junior and non-cardiac trained nurses were assigned to patient care in CCU prompting delayed nursing decisions which affected patients who were not allowed to mobilise, were provided unnecessary oxygen therapy that was not reviewed and ceased, and patients that did not seem to be given their cardiac rehabilitation and discharge education. Further to that, the research nurse saw that Junior doctors and nurses were waiting for ward round decisions to guide patient care, but ward round decisions did not provide all the answers. Senior and patient care nurses were not seen to be participating in the bedside cardiac stream discussions. Many of the ward round studies discussed some of these same concerns in their clinical areas, (Ahmad et al, 2015, Mattinson & Cheeseman, 2018).

1.3.2. Mortality rates

An internal report showed an increase in CCU patient deterioration, with at least three instances resulting in separate clinical reviews (Flinders Medical Centre Cardiology, Department of Medicine, Critical Care and Cardiac Services, 2019–2020). Another internal report revealed an increase in mortality for patients presenting to hospital with acute myocardial infarction (AMI) (Flinders Medical Centre Cardiology, Department of Medicine, Critical Care and Cardiac Services, 2020). These confidential quality and safety reports have been made accessible to the researcher but they are not printable in this thesis. This was a concerning measure of how the CCU delivers quality patient care, and is reflected by many other international cardiology departments who face concerns about mortality rates as a measure of quality. Modern inpatient techniques, such as emergency percutaneous coronary intervention, prognostic medications and cardiac-trained

nurses, have saved many lives; however, the efficient use of and access to these resources, as well as out-of-hours patient deterioration, seems to be impacting AMI mortality (Bajraktari et al., 2008; Januszek et al., 2021; Lee et al., 2021; McHugh et al., 2021). Cardiogenic shock mortality rates remain high despite modern techniques such as mechanical circulatory support for those cardiac patients that present already haemodynamically compromised, or those cardiac patients who are at risk of deteriorating into a shock state (Ouweneel et al., 2019). Therefore, CCU doctors and nurses need to address the perceived lack of team-based care in response to the declining cardiac patient's haemodynamic status. A variety of reasons as to why the CCU culture is failing our patients will be explored, including staffing levels, workload, leadership, and collaboration and communication within the team.

1.3.3. Communication and Collaboration

The unpredictable CCU ward round start times and lack of cardiologist or registrar attendance on full ward rounds created inconsistencies with communication and collaboration. This impacted the time required to gather relevant patient information, left the ward round incomplete, and inhibited cardiac nurses contributing to patient advocacy and collaborative clinical decision making, not only at the bedside but throughout the 24-hour period. There was persistent uncertainty about individual patient treatment plans among the patients and clinicians, and clinical decisions remained unsolved. The impetus for research in this area is not isolated to this CCU. Many other institutions have the same issues, due to workload, bed and clinical demands (Walton et al., 2019a).

1.3.4. Addressing ward round structures

Re-engineering the CCU ward round to include a cardiac nurse was the potential solution that we chose to explore in this project. Nurses are an important part of the ward round team because they advocate for patients and influence quality of care (Lees, 2013; Pucher & Aggarwal, 2015; Pucher et al., 2014). Patients may not be able to converse with the healthcare team, ask questions and gain an understanding of their treatment plan. It is the nurse advocate that supports the patient voice, which will influence effective clinical decisions (Redley et al., 2019; Weber, 2007). That is why this research will investigate the benefits of cardiac nurses attending CCU ward rounds.

The challenge was to implement a ward round intervention that would facilitate a culture of effective decision making throughout the 24-hour period, thus reducing delays in delivering quality

patient care. However, finding the mechanism or structure to use in this endeavour and implementing the new structure could have affected the workplace culture. The goal was to maintain a strong culture of trust and respect between doctors and cardiac nurses, and sustain effective team-based communication where all members have the opportunity and are free to express their opinions and participate in decision making. Finding the correct intervention and structural changes to perpetuate the desired outcome was the challenge.

1.3.5. What does re-engineering mean?

Changes to ward round practice will be required to bring doctors and nurses together on and off the ward round. **Re-engineering** the ward round means restructuring the ward round by introducing nurse attendance on all three ward rounds, and specifying ward round behaviour, document tools and communication processes both on and off the ward round. Originating in business, the term re-engineering refers to a process that affects workflows and organisational structure to improve service delivery, so that quality is improved and time and cost are reduced (Khodambashi, 2013). The Cambridge Dictionary states the definition of re-engineering as "to change and improve the way a company works, the way a job is done" (Cambridge dictionary, n.d.). Re-engineering the ward round will mean a change in practice so that doctors and nurses are placed in situations where they must communicate both in the patient's presence and away from the patient, starting with the morning ward round and finishing before the daytime medical team goes home. This will challenge the current culture and staff behaviour as they try to comply with the new workflow.

1.4. Excellence in healthcare

Healthcare institutions around the world strive for the delivery of quality healthcare, so that they can claim that their institution is a centre of excellence (Elrod and Fortenberry, 2017). This means that patients are expected to receive the highest quality evidence-based medical and nursing care available. Brochures for these institutions convince the reader how important the physical and mental wellbeing of their staff and patients is to the institution and how the highly trained staff are capable of delivering the most up-to-date treatment, in an innovative environment. These institutions want a reputation that attracts not only patients and funding but also the highly trained staff who want to work in a supportive environment with a leadership group that supports a positive workplace culture (Reichert & Furlong, 2014; Sugerman, 2013).

Studying workplace culture and how that affects the delivery of patient care has highlighted just how important teamwork is to the provision of safe and effective healthcare. Current literature states the importance of having good leadership and workplace culture in place; however, there is little instruction or evidence on the mechanism required to achieve this (Anglade, 2014; DiCuccio, 2018). The literature encourages the next researcher to do more about this subject, but it is hard to find a measurable action that can be applied to further research studies and used to build excellence (Reisi et al., 2019).

This PhD will build on the first steps to address the above issues and begin the journey to creating a centre of excellence by reviewing the importance of maintaining quality and excellence in healthcare and how nursing leadership can influence team culture. Insight into how the nursing team interacts with the ward round, particularly how innovative practices have occurred over the years, will then provide insight into how the CCU ward round can promote quality and excellent patient care. First will be an explanation of the clinical setting and the elements that influence effective decision making.

1.5. History of ward rounds

Ward rounds are an integral part of modern medicine. They are an opportunity for the medical team to teach doctors and bring the head nurse to visit each patient and update treatment plans. As discussed previously, nurses play an integral role in representing the patient voice and can contribute holistic advice to the clinical discussion with the medical staff. Kurhila et al. (2020) illustrates an example of a ward round that includes nurses and doctors at the patient bedside. See Figure 1.1. However, it is not only their physical presence that is important but the interaction of team members, and the decisions that eventuate and actions that arise from this process (Kurhila et al., 2020). The ward round is then an avenue for the delivery of quality patient care provided in a timely, efficient manner. The challenge resides in motivating doctors and nurses to continue participating with redesign of the ward round and sustaining the practice change (Perversi et al., 2018).

Figure 1.1: "The medical team around the patient's bed: the consultant at the left of the bed, the nurse on the right, the ward sister further away, the registrar by the computer" (Kurhila et al., 2020, p. 1712)

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Historically, ward rounds were designed for medical staff to congregate around the patient bedside and teach. See Figures 1.2 and 1.3. The ward round provides an avenue to assess, diagnose and formulate patient treatment plans (Crosby, 2004; O'Hare, 2008; Perversi et al., 2018). In modern times, ward rounds include a multidisciplinary approach so that all healthcare workers have an input into decision making about how patients are treated during their hospitalisation and the ongoing care required at home. Contemporary ward rounds ensure patients feel included in their care and get to make decisions about their treatment plans (Rajasoorya, 2016). See Figures 1.4 and 1.5.

Figure 1.2: Photograph taken in 1910 (Walsh, 2018)

Figure 1.3:Doctors Ward rounds, don't suppose these have changed much over the years? (Artwork, Pinterest, Flickr.com accessed: 2021)

Figure 1.4: Fixing the broken medical ward round is in everyone's interest (Baddeley, 2017)

Figure 1.5: Ward rounds: "Doctor and nurse talking to a patient during ward rounds. The doctor is looking at the patient's notes. Other patients' files are in a trolley." (Cole, 2021)

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Although an interdisciplinary or even a multidisciplinary ward round is encouraged as best practice by the Royal College of Physicians (2012, 2021), a variety of ward round structures and methods exist to accommodate complex healthcare requirements within international hospital systems. No single ward round structure or method is a “one size fits all”. Each clinical area has the opportunity to adapt a variety of ward round innovations (Walton et al., 2019b).

Defining the ward round is a challenge in the modern world. A variety of innovations have impacted the structure of ward rounds. These include:

- The healthcare team members that lead and attend ward rounds
- Use of ward round communication tools, for example, checklists and proformas
- Time and space for planning and delivering clinical decisions
- Shared decision making with the patient
- Selective review of patients at different stages of clinical care
- Post-ward round follow-up communication and processes.

The ward round still remains a platform for a face-to-face meeting between clinicians and the patient to plan and deliver safe, quality patient care. However, as patient care becomes more complex and the pressures on healthcare resources rise, ward round methods are continually adapting to maintain the level of care. As a result, inconsistent ward round methods can confuse team members’ expectations of their role (Fielding et al., 2013; Gurses & Xiao, 2006; O'Leary et al., 2012; Walton et al., 2016).

1.6. Role of ward round team members

1.6.1. Doctor

A traditional hierarchy exists within healthcare. Medical staff, particularly the consultant, often take the lead as they are making diagnostic and therapeutic clinical decisions for the patient (Walton et al., 2016). Both senior and junior doctors attend the ward round. Someone needs to inform the team about the patient, speak to the patient, examine the patient, write the orders, and document treatment plans. This is often undertaken by the team of doctors. There is a still a strong emphasis on teaching at the bedside as junior doctors have to learn to make clinical decisions and what is expected of them during the ward round (Baathe et al., 2016; Banfield et al., 2018; Curtis et al., 2014). The ward round is the place for sharing information between members of the ward round team. The clinical assessment needs to be confirmed so that the treatment plan can be formulated and shared among the patient care team and the patient.

1.6.2. Nurse

Nurses often feel that their advocacy role does not extend to clinical decisions (Walton et al., 2019a). Lees (2013) disagrees and feels that the nurse's action of advocacy informs better clinical decisions, and they actually lead the direction of the treatment plan. The nurse then enacts the treatment plan, and delegates and coordinates patient care and discharge planning. Nurses do not exist to purely follow medical orders but can think critically and holistically about the patient care journey (Lees, 2013). A positive team culture and stronger interdisciplinary ward round teams can be achieved when nurses and doctors share the management of the patient's treatment plan. Nurses who share the ward round leadership with the consultant provide more support, guidance and structure to the members of the healthcare team, to enable better patient care delivery (Lees, 2013; Pannick et al., 2016).

Cole (2014) points out that nurses are there to help patients make individual and informed decisions about their healthcare. To comply with current standards of practice, the nurse must defend the patient's rights and ability to act autonomously. Although both "advocacy" and "scope of practice" are poorly defined terms, Cole et al. (2014) and Birks et al. (2016) agree that they must be considered in the context of clinical practice. Nurses need the freedom to adapt to the clinical environment and workload to deliver quality patient care (Birks et al., 2016; Cole et al., 2014), which includes having opportunities to interact with the ward round team and be involved in formulating individual patient treatment plans.

1.6.3. Pharmacist

The presence of pharmacists on the ward round is also valued as they guide prescribing decisions. Patient medication regimens become safer and more beneficial when a pharmacist is consulted by the ward round team at the bedside. Pharmacists are included in the multidisciplinary team (Triggle, 2012) and counted as the allied health team member in some studies (Bullock et al., 2019; Mulvogue et al., 2017; Veggeland & Dyb, 2008).

1.6.4. Allied health

Allied health team members including physiotherapists, dieticians, speech therapists, social workers and occupational therapists are included in the concept of multidisciplinary ward rounds. The presence of allied health team members on the ward round is relied upon for complex patient needs. Patients enjoy speaking to the entire team at the one time, and allied health staff benefit from direct communication with doctors and nurses at the bedside. This team collaboration and

patient participation facilitates discharge planning goals; however, it is often the case that allied health team members do not feel they can make decisions on the ward round. To them it is the medical staff who make those decisions (Walton et al., 2019b).

1.7. Patient-centred care and patient inclusion: where to from here?

Figure 1.5 above shows a discussion between the patient and ward round team. To comply with the National Safety and Quality Health Service (NSQHS) "Partnering with consumers" standard (Australian Commission on Safety and Quality in Health Care [ACSQHC], 2020), patients need to be involved with their own treatment plans, so that they get to make the decision whether to accept or reject a health professional's advice. Due to healthcare workload and time constraints in our hospitals, and the ward round team now being more focused on the patient's needs, teaching opportunities at the bedside have become limited, and formal teaching is offered at another time and space (Perversi et al., 2018; Redley et al., 2019; Walton et al., 2019a, 2019b).

Modern ward round models now vary across the many different types of institutions throughout the world. Research has focused on clinician behaviour, decision making and members of the ward round team, and looked at various tools to improve the quality of ward round delivery. Each study encourages more research on this subject (Banfield et al., 2018; Crossfield & Pitt, 2012; Fernandes & Eneje, 2017; Gilliland et al., 2018; Kyte et al., 2020). As healthcare becomes more complex and resources are limited, it seems appropriate to introduce a best practice standard for ward rounds conducted in Australia. The British Royal College of Physicians (RCP), in collaboration with the Royal College of Nursing (RCN), have already set this standard for the National Health Service (NHS) (RCP & RCN, 2012, 2021b). This presents an opportunity to adapt these guidelines and other research into our CCU ward round practice.

1.7.1. The patient perspective

If we are seeking to improve the quality of patient care we need to know how our patients think and feel about their care. Have we asked the patient what matters to them? O'Hara et al. (2018) performed a study in the UK on patient safety reports by getting patients to express concerns regarding their care. They found that healthcare institutions do not routinely seek patients' perceptions about their care, especially in regard to safety reporting guidelines. These guidelines are mostly used as a clinician reporting tool, and, therefore, are not being used to optimise delivery of patient care. In their study, 65% of patient-reported safety incidents were not even classified as an unsafe event. These incidents included concerns about "physical comfort", "fear",

"uncertainty" and "delays" (O'Hara et al., 2018, p. 680). Ignoring these concerns fails to capture patient experiences and address this element of quality in patient care delivery. Can we go so far as to say we are making our patients suffer because we do not provide enough opportunities for them to express their needs and concerns?

Upadhyai et al. (2020) inform us of the value of understanding the patient viewpoint when gathering all the information we need to properly assess our patients. However, as shown in the O'Hara et al. (2018) patient safety incidence study, 65% of patient reports, including concerns regarding physical comfort, fear, uncertainty, and delays in procedures and care delivery, would not be captured in usual patient safety audits. This is because most safety audits are collected by case note review and rely on staff to report safety concerns. O'Hara's randomised study asked the patients directly about their concerns. The most common reports were about communication issues. This patient feedback enabled "ward staff to engage in service improvement" (O'Hara et al., 2018, pp. 677–680; Upadhyai et al., 2020). If we are to build excellence then, surely, we must ensure the whole patient voice is available to the healthcare team.

1.7.2. Nurse surveillance and assessment skills

As mentioned earlier, less experienced cardiac-trained and more junior untrained nursing staff may provide direct patient care to acute cardiac patients. The assessment skills of these nurses may not be as developed and they often rely on the only early warning system available to them: the rapid assessment deterioration and response (RADAR) observation charts, used nationwide. These charts guide the response to vital signs numbers that trigger an alert to escalate a patient's care to a senior nurse, doctor or ICU review to detect and prevent patient deterioration. This process relies on a predicted protocol response escalating care immediately rather than nurses using surveillance skills to assess the patient and provide treatment prior to or at the same time as escalating to a senior nurse, doctor or ICU review (Burns et al., 2018, Aiken et al. 2017). When constrained by such policies, nursing staff are losing their critical thinking skills and encouragement to make effective decisions.

In addition, if a patient's vital signs are within normal limits and the patient's emotional and physical distress can be hidden from the nurse, nurses may not recognise patient suffering (Ziemska et al., 2013). Therefore, measuring the patient's quality of life and anxiety and depression scores could provide more insight into our patient's needs.

1.8. Quality and excellence

The term “excellence” in healthcare is ambiguous. Its use is often driven by an individual organisation’s strategic direction and success in attaining quality control awards through accreditation processes. Institutions and organisations use the label – a centre of excellence – to improve their reputation and attract staff, patients and funding. Hospitals make every effort to excel in their healthcare delivery. Providing the best possible care to patients encourages more referrals to the institution and attracts highly qualified staff. At the same time, giving healthcare workers a high job satisfaction reduces staff sick leave and attrition rates. Health departments demand the delivery of quality patient care as long as healthcare costs fall within the government’s budget.

Doctors, nurses, allied health and ancillary staff members want to provide good quality patient care outcomes but have to work within their allocated budget and resources. Hospitals and healthcare institutions, therefore, prioritise the allocation of funds to focus on individual quality programs. The success of these specific programs helps the institution improve their reputation as a quality healthcare provider. Credentialing processes, and objective examination and approval of these quality programs can allow a hospital or institution to claim itself as a centre of excellence. The question is, does having these quality programs in place translate to practice and reflect the outcomes the organisation desires (Elrod & Fortenberry, 2017; Stone et al., 2019, p. 118)?

For an organisation to claim to be a centre of excellence, most of them must adhere to the core accreditation standards as per the Australian NSQHS Standards. Three standards – Comprehensive care, Partnering with consumers, and Communication for safety – all address the importance of collaboration, communication and engagement within a teamwork culture that embraces a multidisciplinary approach and, especially, patient participation. Although the ward round is not specifically mentioned, the NSQHS standards suggest using structured multidisciplinary communication processes, such as checklists, handover and patient bedside meetings, to optimise patient care quality and efficiency (ACSQHC, 2020). The standards cite the Tang et al. (2013) argument that quality patient care requires nurses and doctors to collaborate, not only to improve teamwork culture but to also recognise nursing’s role in making clinical decisions.

The hospital in which this PhD study was conducted gained accreditation status in 2019 and 2023, when assessed by the Australian Council on Healthcare Standards to be compliant with all NSQHS standards, but does that mean patients receive excellent clinical care? In this CCU, a reduced

cardiac-trained nurse skill mix, episodes of patient clinical deterioration and concerns by CCU clinicians have resulted in discussions in quality review forums such as the clinical review committee, mortality meetings and nursing executive meetings. This demonstrates that the accreditation process and quality improvement activity is a perpetual program that may or may not necessarily adapt to the day-to-day quest for supplying safe and high-quality care (Leggat & Balding, 2018).

A reputation as a centre of excellence for this CCU may be achieved when timely care is being delivered to patients, while fostering a team culture where mutual trust and respect exists between the CCU doctors and nurses, all of the time. However, staffing levels, workload and current ward round practices have been eroding the current workplace culture. This means that achieving a level of excellence for this CCU will require rebuilding the structures that shape the three CCU ward rounds.

An alternative quality improvement program that influences a hospital's status as a centre of excellence is the Magnet Recognition program®.

1.8.1. Magnet hospitals

The Magnet program is run by the American Nurses Credentialing Center and thus focuses on the nursing workforce as the drivers of quality. "Organizations must meet the eligibility requirements stipulated by the Magnet Recognition Program in order to achieve Magnet status" (Márquez-Hernández et al., 2020, p. 28). Hospitals throughout the world use the Magnet hospital approval status to boost their standing to attract patients and highly educated staff, and to reduce costs.

Three Australian hospitals have attained Magnet hospital status (Centre for Clinical Effectiveness, 2019; Stone et al., 2019). They are:

1. Sir Charles Gairdner Hospital, Perth, Western Australia
2. St Vincent's Private Hospital, Sydney, New South Wales
3. Princess Alexandra Hospital, Brisbane, Queensland.

Márquez-Hernández et al. (2020) completed a systematic review of Magnet hospitals worldwide. They studied outcomes related to nursing, patients and the organisation. They found that Magnet hospitals are more successful in providing "better nursing work environments and are associated with better outcomes for nurses, patients, and organizations" compared to non-Magnet hospitals

(Márquez-Hernández et al., 2020, p. 38). However, a small portion of hospitals did succeed in attaining some of these outcomes without having Magnet status.

“Magnet hospitals are supposed to have open communication between nurses and other members of the health care team, and an appropriate personnel mix to attain the best patient outcomes and staff work environment” (Centre for Clinical Effectiveness, 2019, p. 1). It is the workplace culture, nurtured by the organisation’s leaders, that will influence how its workers will interact with each other (Moss et al., 2017). Although there is no direct reference to the ward round in the Magnet program, the program highlights the important contribution nurses can make to quality patient care, not only in clinical care but also in nursing research (Pintz et al., 2018). Thus, research into inclusion of nurses in the ward round team may prove beneficial to patient outcomes.

1.8.2. Nurses can lead excellence in quality patient care

The Princess Alexandra Hospital has demonstrated the success of its Magnet hospital program, recognising that an increased nursing attrition rate reflected by a failing culture could be turned around by empowering nurses to make decisions and be accountable for their decisions, and by trusting and allowing them to innovate, while recognising and supporting their contribution to the hospital (Moss et al., 2017). The hospital also invested in their nursing leadership to “sustain and strengthen” their “culture” (Moss et al., 2017, p. 118). Improved patient outcomes demonstrate that nurses are the drivers of quality improvement. “Hallmarks of successful organizations include flat organizational structure with accessible and informed managers, decentralized decision making, and the empowerment of frontline workers to make decisions” (McHugh et al., 2013, p. 382).

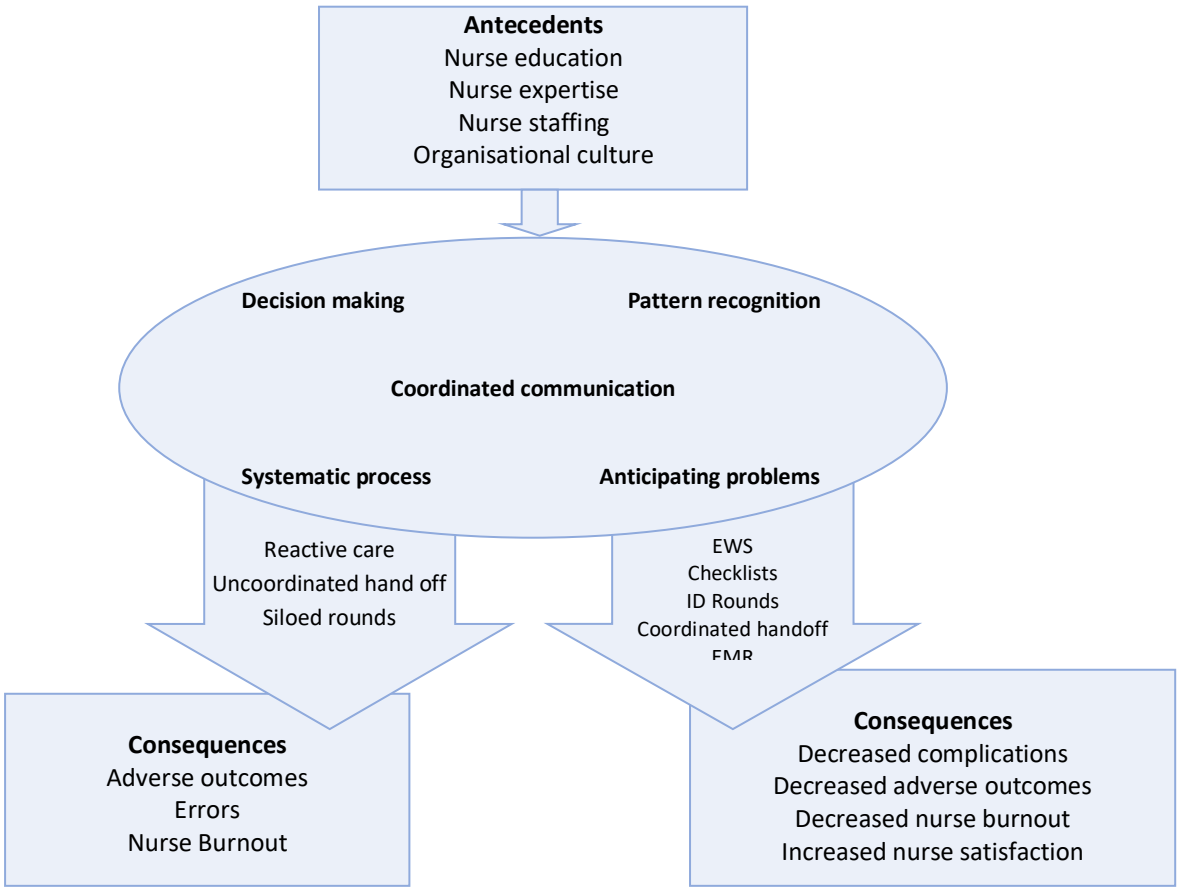
1.9. Nursing surveillance

The lack of experienced, trained cardiac nurse participation in cardiology teams at the patient bedside and away from it means there is an inadequate contribution towards holistic care of the cardiac patient. This results in missed communication opportunities and thus gaps in patient care knowledge among cardiac doctors and nurses. Aiken’s, (2017) study which examined the effects of inadequate nursing skill mix across various European hospitals, concluded that the presence of less experienced and qualified nurses can lead to higher mortality rates and exacerbate nursing shortages. Therefore, this thesis will try and convince the cardiology department and the hospital

executive to ensure a cardiac-trained, experienced nurse belongs to each of the three cardiac streams.

A framework that supports cardiac nurses' contribution to excellence is "nursing surveillance". Developed by Halverson and Scott Tilley (2022), this framework appreciates the nuances that can be recognised by experienced nurses to assess their patients and protect patients from adverse events; however, to facilitate patient safety, the organisation's culture is also essential to support staffing levels and education, and to value nurses' expertise (Halverson & Scott Tilley, 2022). See Figure 1.6. This framework was developed from Benner's original work in the 1980s on the nurse's clinical journey from "novice to expert", which was further established by Tanner (2006) when early detection of the deteriorating patient started to be discussed. It was acknowledged that nurses with a variety of experiences and length of time in the profession develop more knowledge, skills and confidence in their ability to assess and advocate for their patient (Dresser, 2012; Dresser, 2019; Tanner, 2006). This is why this thesis wants to emphasise the importance of cardiac-trained senior nurses attending ward rounds. Advocacy and nursing surveillance skills of cardiac trained senior nurses are more finely tuned, then they were before they were cardiac trained. They have the confidence to speak up and thus contribute to efficient decision making and the provision of timely patient care, particularly with more than 5 years of cardiac nursing experience.

Figure 1.6: Nursing surveillance (Halverson & Scott Tilley, 2022)



EWS: early warning system; ID rounds: interdisciplinary rounds; EMR: electronic medical records,
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Nursing surveillance is a complex concept. The framework above displays the five attributes of nursing surveillance that should be in place to prevent reactive care and promote proactive care:

1. Systematic process: Consistent two-way communication where nurses can discuss, query and understand the information about the patient.
2. Pattern recognition: For example, noticing trends in patient signs and symptoms and being able to accurately analyse them.
3. Anticipating problems: Having the knowledge to be able to predict and deal with problems as they arise to either prevent deterioration or escalate concerns.
4. Coordinated communication: Enabling situational awareness so that the nurse feels comfortable and articulate when communicating with the healthcare team and vice versa.
5. Decision making: Interpreting the information that is available and is actively sought after so that action can be taken according to clinical judgement.

Patient care in the CCU may improve if these processes are in place, and our cardiac nurses have the trust from nursing mangers and leaders to provide proactive care, therefore promoting excellence in patient care.

1.10. Leadership

1.10.1. Nurses can lead from the bedside

Leaders are responsible for harnessing new ideas and supporting the research and quality improvement processes required to implement them. Fostering a culture that embraces ideas and acts on them makes staff feel valued. Nurses utilise leadership skills when they make decisions about patient care in their day-to-day work, whether they supply direct patient care, support patient care or coordinate the ward (Dryer, 2018). Nurses gain leadership skills and opportunities, training and feedback through their curriculum and career journey in regard to patient care (Bender et al., 2019; Middleton, 2013), whereas training in medicine focuses on clinical abilities rather than leadership skills (Lerman & Jameson, 2018). Nurses can therefore lead and collaborate with medical staff to influence patient care, especially if the entire healthcare team values their opinion and vice versa.

1.10.2. Teamwork

As part of the internal quality programs, the CCU/hospital in which this PhD research was done runs clinical review meetings to report on significant clinical patient care events. The cardiology clinical review meeting discussed concerns about the CCU team culture. Recent incidences related to the management of CCU deteriorating patients demonstrated that team members lacked trust in each other's clinical judgement. CCU doctors and nurses, and thus this author, have been informed of these concerns and asked to find a way of improving their team culture. The CCU ward round is an opportunity to address this issue. Other CCUs suffer similar clinical issues and have created ward round innovations to address quality patient care, successfully reducing length of stay and CCU bed demands (Currey et al., 2019; Javaid et al., 2017; Ramkumar et al., 2017). Unfortunately, throughout the healthcare system, the impetus to improve quality care comes from critical incidences such as those seen in our CCU (Haigh & Ormandy, 2011). One CCU study on teamwork culture found that the delivery of quality patient care is affected by individuals displaying both negative and positive behaviours towards each other. This is due to communication and collaborative factors. It is important that further investigations and emphasis

on teamwork culture promote more positive relationships, with the institution taking responsibility to promote better teamwork culture (Goulart et al., 2016).

Clinical leaders that support the healthcare team can motivate staff to perform better and have more resilience so they can maintain empathy towards their patients and their families. Furthermore, providing positive feedback and showing respect is at the heart of a positive workplace culture (Badu et al., 2020). Engaging senior clinicians, both nursing and medical, to invest in the CCU ward round team is critical for improving team culture. Allowing doctors and nurses at all levels to present their opinions and be involved in clinical decisions will provide the collaboration and confidence they need to learn and apply current best practice to patient care. A more cohesive team will help to improve patient care (Desai et al., 2011; Thornberg, 2014; Watson, 2016).

1.11. Thesis outline

1.11.1. Purpose

The purpose of this research is to create excellence in cardiology by re-engineering the CCU ward rounds through enhanced cardiac-trained nurse input and advocacy to improve decision making and deliver patient-centred care.

1.11.2. Aim

The intent of the re-engineered ward round is to enhance the clinical decision-making and communication environment in the CCU. Including cardiac nurses on the ward round seeks to assist cardiac doctors and nurses in making evidence-based clinical decisions to deliver a patient treatment plan that is specifically understood and accepted by the patient and all members of the cardiac streaming team so that patient care is delivered sooner.

1.11.3. Objectives

The first five specific objectives represented by study one of this thesis are to:

Objective 1

Evaluate team culture and effective decision making after re-engineering the cardiology ward round (introducing changes to traditional ward round practice and workflow), by measuring effective decisions through patient care delays, particularly delays in administration of cardiac medication, and through patient and staff surveys.

Objective 2

Understand whether nurse advocacy and senior support can contribute to efficient clinical decisions by comparing ward rounds with and without cardiac nurse presence, by measuring cardiac medication administration delays and delivery of key clinical patient care activities.

Objective 3

Determine whether the re-engineered ward round enhances the clinical decision-making and communication environment to deliver more timely quality patient care, by measuring cardiac medication administration delays and delivery of key clinical patient care activities.

Objective 4

Develop an intervention that assists cardiac doctors and nurses in making evidence-based clinical decisions by providing more opportunity for staff interaction and successful situational awareness to reduce patient care delays in and out of hours; the primary outcome, delays in the administration of cardiac medications, will indicate the impact of this intervention on team culture.

Objective 5

Provide a mechanism that ensures patient treatment plans are specifically understood and accepted by the patient and all members of the cardiac streaming team, so that patient care is delivered sooner; staff and patients will be surveyed to measure their understanding about treatment plans.

The sixth and final objective, represented by the second study is to:

Objective 6

Evaluate 1 year after the project to see whether a culture change has been sustained, by comparing primary and secondary endpoints at the two time points, as well as through staff interviews.

1.11.4. Hypothesis H_1

Structured improvements in ward round planning, attendance and communication between key ward round stakeholders during and after ward round, especially nurses, will support the clinical decision-making process so that patients receive prompt evidence-based care, leading to reduced delays in medication administration and the delivery of high-quality patient care. This high-quality care delivery will remain 1 year later if these improvements and workplace culture changes are embedded into everyday practice.

1.11.5. Question and gap in knowledge: Do cardiac nurses belong on the ward round?

The thesis will develop this question through five chapters: an introduction, literature review, description of the study design, results review, and a discussion to explore the future implications of this research.

To further define each of the study questions to support the research strategy, this thesis uses the standard population, intervention, comparison, outcome (PICO) model (Kloda et al., 2020). See Table 1.1.

In this study, the PICO model highlights the cardiac doctors and nurses and the patients as the population. The intervention focused on the ward round, where decisions were made about the treatment plan. A re-engineered or newly designed ward round was then compared with the usual ward round during the first study. The desired outcome was to hopefully supply patient treatment sooner, measured in primary and secondary outcomes. These outcomes were measured during the first study and then, for the follow-up study, measured again 1 year from the new ward round implementation date.

Table 1-1: Population, intervention, comparison, outcome (PICO) for thesis studies

P (Population)	I (Intervention)	C (Comparator)	O (Outcome)
All cardiac patients admitted to the cardiac care unit (CCU), belonging to one of the cardiac streams: acute coronary syndrome (ACS); arrhythmia (ARR); or heart failure service (HFS)	Require treatment Decisions made on the ward round	Control: Business as usual Intervention: Re-engineered ward round	Receive patient care sooner Receive high-quality patient care
All doctors allocated to one of the cardiac streams: ACS, ARR, HFS	Need to make decisions about the patient treatment plan on the ward round Need to make informative decisions requiring nursing input and patient inclusion	Control: Business as usual Intervention: Re-engineered ward round	Patient choices are considered Decisions regarding key clinical activities are made sooner Structural changes to ward round measured 1 year later
All cardiac nurses working in CCU and coordinating the early or late shift that need to interact with the cardiac streams: ACS, ARR, HFS	Need to advocate for the patient and be involved in decision making regarding the treatment plan when it is made on the ward round	Control: Business as usual Intervention: Re-engineered ward round	Patients are included in decision making regarding their treatment plan Decisions regarding key clinical activities are made sooner Structural changes to ward round measured 1 year later

Using this PICO model, the research questions for the new ward round design study (Study 1) and the follow-up study (Study 2) can then become:

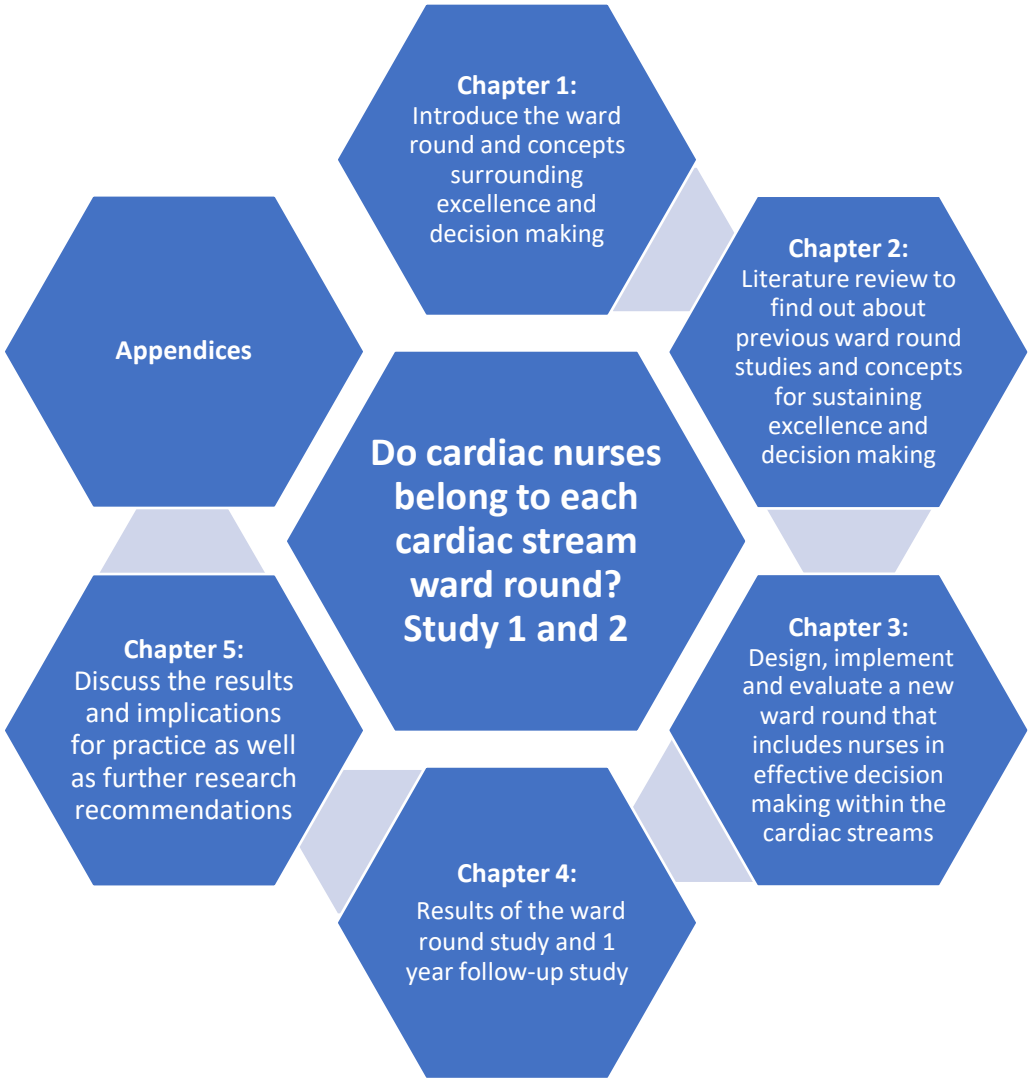
Study 1: Does a re-engineered ward round that includes cardiac nurses provide quality patient care sooner?

Study 2: Has the culture and practice change on the ward round to improve efficiency of care and patient-reported outcomes been sustained 1 year later?

1.12. Thesis outline

Figure 1.7 shows how the research problem will be addressed throughout all five chapters.

Figure 1.7: Thesis outline and structure



1.12.1. Chapter 1

Chapter 1 describes the clinical setting, and the history and significance of the ward round in the pursuit of excellence and provision of high-quality care to our CCU patients. The nurse's contribution to leadership, quality of care, patient inclusion and communication with the healthcare team is well supported in the literature; however, more research is required to demonstrate that structural changes to workflow can improve team culture and thus impact patient care. This study, therefore, aims to demonstrate whether nurse advocacy and senior support, via a re-engineered cardiology ward round, can influence team culture and thus contribute to efficient clinical decisions.

Further to that, the intent of the re-engineered ward round is to enhance the clinical decision-making and communication environment. The aim is to assist cardiac doctors and nurses in making evidence-based clinical decisions that deliver a patient treatment plan, which is specifically understood and accepted by the patient and all members of the cardiac streaming team, so that patient care is delivered sooner.

This study is about the importance of cardiac nurses attending the ward round, as well as finding which structural changes promote communication and collaboration between cardiac nurses and doctors during and following the ward round, and therefore improve workplace culture. The cardiac nurse is a valuable member of the ward round team, and their inclusion can influence a workplace culture of trust and respect between its members. These relationships can promote the delivery of quality care outside of the ward round and throughout the 24-hour period. The cardiac clinical nurse researcher is there not only to investigate workplace culture but to also provide leadership to the CCU team and help build and maintain a culture that can facilitate CCU's reputation as a centre of excellence.

The follow-up study will investigate how many of these ward round structural changes have or have not been implemented into everyday practice. The benefits and barriers will inform opportunities for further research.

1.12.2. Chapter 2

A comprehensive literature review of previous ward round studies is presented, with a conceptual framework for the study as well as the concepts that contribute to decision making and practice change.

1.12.3. Chapter 3

This chapter details the design and methods of the new ward round and how it is implemented, as well as the structural elements of the ward round and the opportunities for doctors and nurses to improve communication and collaboration.

The second study, conducted 1 year and beyond after the initial ward round study, will explore the sustainability of the project, using qualitative and quantitative methods.

This chapter will also contain the ethics and governance implications for this study. This includes data safety and security, confidentiality of participants, the type of consent required for each study, and ethics feedback and approval processes.

Following our initial ward round study, there was an opportunity for engagement with doctors, nurses, and the wider academic and professional community to discuss the study results. This engagement, through posters and presentations, was initially at the ward, department and hospital levels, and then progressed to the network, state and national levels. This provided a means of informing doctors, nurses and the wider community about the results of the ward round study and to discuss the benefits of including a cardiac-trained nurse on cardiac ward rounds. This engagement occurred over an 18-month period.

We wanted to determine whether any of our recommendations on changes in the ward round structure were applied to practice, as well as explore the possible benefits or barriers to nurses attending the ward round. Therefore, an ethics amendment was undertaken to include another observational study of the ward round along with staff interviews. The design and results of this follow-up part of the ward round study are found in Chapters 3 and 4.

1.12.4. Chapter 4

This chapter analyses and provides the results for the primary and secondary study outcomes, as well as the qualitative results from the patient survey (Study 1). There is also more evidence taken 1 year and beyond after the initial ward round study to reflect on practice and find out what doctors and nurses felt about effective decision making on the ward round, leading to a final thematic analysis.

1.12.5. Chapter 5

This chapter discusses the study results in context with the theoretical framework so that we can see the important take-home messages and what this may mean for practice and further research. This discussion will include the strengths and limitations of this study, recommendations for further research, implications for practice, and the conclusion.

1.13. Conceptual Framework

The theoretical framework underpinning this thesis will try to understand the causal factors for effective decision making and how interactions between doctors and nurses and patients affect the timely nature of these decision as well as the workplace culture. The behaviour change wheel and a directed acyclic graph will help determine what factors influence these things. This is explained in more detail in Chapter 2.

Chapter conclusion

This chapter shows that, in the pursuit of excellence, the delivery of quality patient care requires leadership so that staff are aided in their ability to maintain clinical standards. Uniting the CCU doctors and nurses may provide the impetus for better communication and create a more cohesive clinical relationship. Therefore, including nurses on the ward round as the mechanism to improve quality should not only affect teamwork but also how well we interact with our CCU patients. The workplace culture and reputation for excellence may then grow as teamwork and quality patient care continues to improve.

This chapter explored the definition and place of excellence within the healthcare environment. Leaders empower their workers to innovate and perform at their best to achieve quality outcomes. This affects workplace culture and how people work together to not only make decisions but deliver responsible patient care according to those decisions. As previously stated, the ward round combines all of these elements and is therefore the place where excellence can thrive.

The next chapter will describe a structured literature review to seek out information that will support the achievement of excellence in ward round practice and how nurse participation affects patient care.

CHAPTER 2. LITERATURE REVIEW

Chapter 2 presents the current literature on ward round studies and how nurses affect quality patient outcomes. A conceptual framework embedded in the behaviour of the ward round team and the elements that contribute to effective decisions will then provide the building blocks for the design of the ward round study.

2.1. Introduction

This chapter presents a structured literature review of published ward round studies that informed the design of this study, including the concepts that underpin the future success of this project. This thesis has a strong focus on effective decision making by nurses and how that influences the delivery of excellent and timely patient care. The impact of leadership on workplace culture also requires an understanding of human behaviour and how staff adapt to change. These concepts need to be understood to achieve success and sustainability with the new ward round intervention. Themes extracted from literature searches shaped this structured literature review.

2.1.1. The research question finds other themes

As discussed in the previous chapter, our research question is exploring the benefits of nurses attending the ward round. The six objectives focused on nurse advocacy, and the ability to capture the mechanism that enables effective decision-making, communication and collaboration between doctors, nurses and the patients as well as the outcome to quality and timely patient care delivery. Then to see if a culture change has occurred, promoting and sustaining better ward round behaviour into the future by re-measuring the data one year later.

Boolean phrases, written in detail for each proceeding section, were placed into an average of 5 databases and PRISMA flowcharts were created to first explore the literature for previous ward round studies and research about combined nurse-doctor decision making. This revealed a lack of consistency in ward rounds around the world and that cardiac medication administration delays along with other key clinical activities were quantitative variables, not yet explored in relation to ward round research. There were also findings promoting a workplace culture that supports decision-making processes within healthcare, (O'Leary et al, 2019, RCP & RCN, 2012, 2021a). The importance of creating a centre of excellence to promote quality patient care delivery and staff retention also became clearer, (Pucher & Aggarwal, 2015). Acknowledging this gap in quantitative and qualitative research we decided to broaden our themes to include the delivery of excellence

and acknowledging culture as an adjunct to decision-making created extra search terms for the literature review. Therefore, this literature review focused not only on the ward round and nurse participation but broadened the search to account for the following three themes that connect to the thesis objectives as follows:

Excellence

- Provide a mechanism that ensures patient treatment plans are specifically understood and accepted by the patient and all members of the cardiac streaming team, so that patient care is delivered sooner.
- Develop an intervention that assists cardiac doctors and nurses in making evidence-based clinical decisions, by providing more opportunity for staff interaction and successful situational awareness to reduce patient care delays in and out of hours.

Culture change

- Evaluate team culture and effective decision making after re-engineering the cardiology ward round, by measuring effective decisions through patient care delays, particularly delays in administration of cardiac medication.
- Evaluate 1 year after the project to see whether a culture change has been sustained, by comparing primary and secondary endpoints at the two time points, as well as through staff interviews.

Ward round design

- Understand whether nurse advocacy and senior support can contribute to efficient clinical decisions by comparing ward rounds with and without cardiac nurse presence, by measuring cardiac medication administration delays and delivery of key clinical patient care activities.
- Determine whether the re-engineered ward round enhances the clinical decision-making and communication environment to deliver more timely quality patient care, by measuring cardiac medication administration delays and delivery of key clinical patient care activities.

The review sought to determine how much evidence and research existed to support the benefits of cardiac nurses participating in cardiology ward rounds, and how nurse involvement with the medical team contributes to the delivery of timely, quality patient care in the pursuit of excellence. Current ward round research and quality improvement projects were examined to find the gap in knowledge, as well as to help formulate the design of the project (as described in the

next chapter). The knowledge gap relates to the effect that nurses have on the timely administration of cardiac medications and other clinical activities.

2.2. Building the structured literature review

Within the three themes of excellence, culture change and ward round design, further ideas were used to build this literature review and develop the search strategies. See Figure 2.1 for each element that evolved from the three themes, including the conceptual framework. These elements ultimately influenced the search strategies.

This literature review first explored excellence in healthcare, particularly what it means to be a cardiology department that seeks or claims to be a centre of excellence. Leadership and culture were major themes found in the excellence search as they influenced the delivery of quality patient care. We then focused on how nurse decision making influenced the delivery of quality patient care. Decision making was later discussed in more detail when exploring the concept of effective decision making through situational awareness and nursing surveillance.

The next step was a review of previous ward round research investigating the quantitative and qualitative ward round strategies that contribute to the timely delivery of patient care. This assisted the design of the ward round study. All searches looked at the last 10 years and excluded non-english published articles.

Ultimately the three themes of excellence, culture change and ward round design in this literature search were divided into four main search strategies:

1. **Excellence in healthcare:** See Appendix 2
    - Search 1; Excellence in healthcare and cardiovascular care
      Two Boolean phrases placed into 5 databases, 12 MeSH terms
    - Search 2; Excellence in hospitals
      One Boolean phrase placed into 5 databases
2. **Leadership and workplace culture:** See Appendix 4
    - Search 3; Culture and leadership
      Two Boolean phrases placed into 2 databases, 15 MeSH terms
3. **Nursing excellence:** See Appendix 6

- Search 4; Nursing Excellence

  One Boolean phrases placed into 3 databases, 4 MeSH terms

  Keywords placed into Endnote
- Three more themes extracted

  Nursing leadership, Nurses and decision making, Nursing surveillance

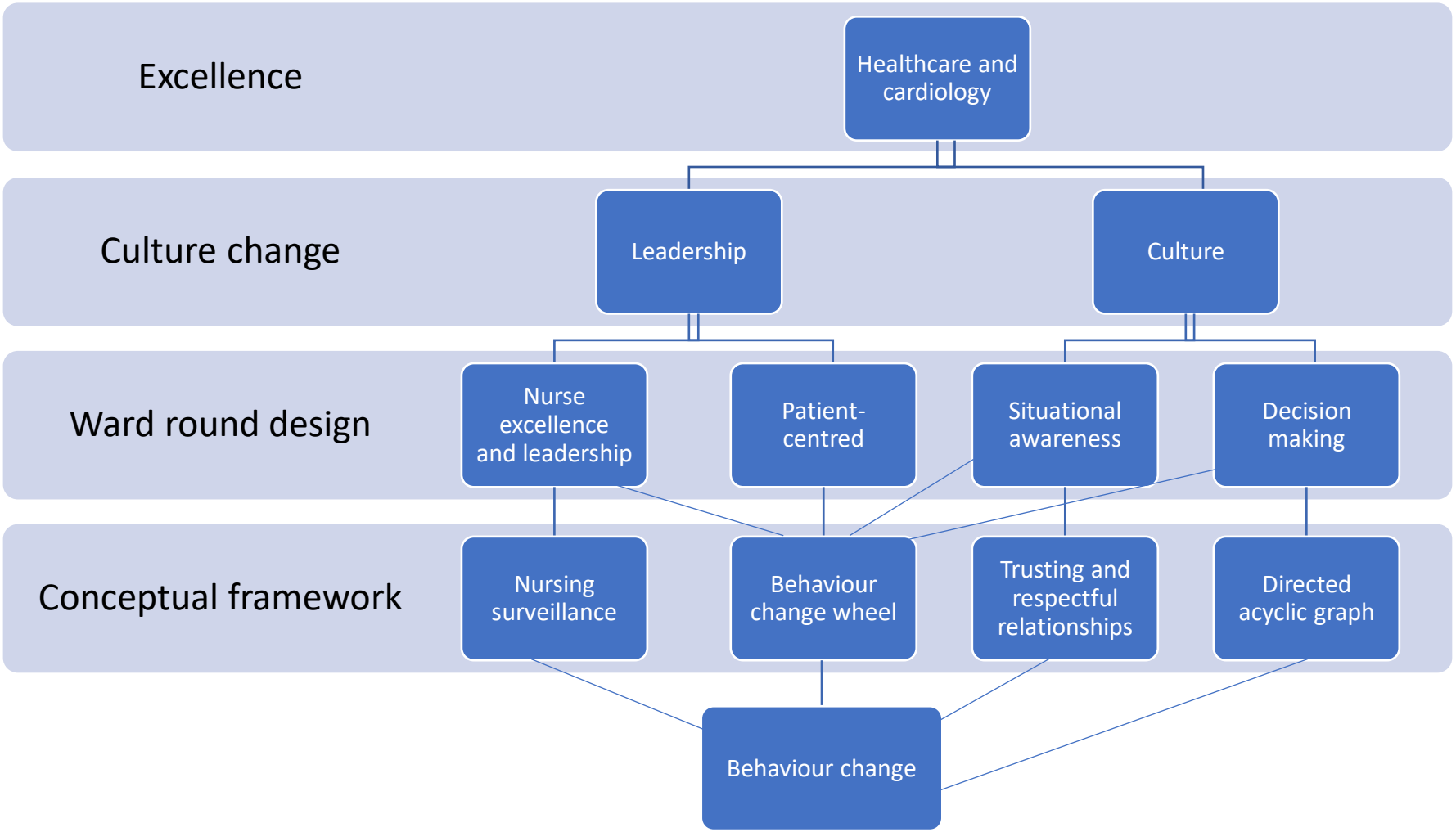
4. **Ward round study design concepts.** See Appendix 8
   - Ward round search;

     Initial Boolean phrase placed into 7 databases, then added with AND, three further phrases, 7 MeSH terms
   - Endnote article search;

     Four Boolean phrases and keywords
   - Extracted ward round studies then added keywords to Endnote to find cardiac ward round studies.
   - "ward round" search in google discovered 'NHS ward round guidelines'
   - Result; 29 ward round study articles

We also needed to understand how to motivate healthcare staff to change their behaviour so that they improve and sustain the delivery of quality patient care. At the end of this chapter, some concepts that underpinned the success of re-engineering the cardiology ward round will be discussed. The conceptual and theoretical framework of this thesis will be revealed at the end of the structured literature review.

Figure 2.1: Literature review structure



This model will be followed throughout this chapter, ending with the conceptual framework.

2.3. Excellence in healthcare

2.3.1. Structured literature search for building excellence in healthcare and cardiology

Chapter 1 defined excellence in healthcare; now we must search for the building blocks required to create excellence in healthcare. The first part of this literature review narrowed down the search further to what it takes to achieve excellence in cardiology. Databases used for the search were: Cumulative Index to Nursing and Allied Health Literature (CINAHL), ProQuest, MEDLINE-OVID and PubMed and SCOPUS, with Boolean phrases including:

- (TITLE: excellence) AND (healthcare)
- (TITLE: "centre of excellence") AND (healthcare AND hospital) AND (build OR create)
- Adding (cardiac or cardiovascular or cardiology or heart or "coronary care unit").

Only journal articles were included; 49 newspaper articles, duplicates, non-English articles and articles greater than 10 years old were excluded. See Appendix 2.

Although the search specified proof of excellent cardiac patient care, some of the retrieved articles also assisted with our understanding of nursing excellence, organisational culture, and the influence of leadership on the delivery of excellent cardiac and non-cardiac patient care. Therefore, these bonus articles are useful when discussing nursing excellence and assist with the underlying concepts of this thesis.

This was a manual library search using five databases. The PRISMA 2020 Statement guidelines and flow diagram were used to satisfy the systematic nature of this literature review (Page et al., 2021). The PRISMA reporting tool in Appendix 3 shows the searches and article screening, and how articles were sorted into relevant subjects for this literature review.

2.3.2. Findings

Excellence and its influence on patient outcomes are widely discussed in the healthcare sector. A total of over 500 articles were retrieved and then narrowed to 91 useful studies, reviews and articles on excellence in healthcare. Using the PRISMA flowchart these were reduced to 21 articles, with 10 identifiable studies pertaining to excellence in cardiovascular medicine and the cardiac patient. Incidentally, there were six articles revealing the importance of nurses' influence on excellence in patient care. Two other articles suggest leadership and the workplace culture also create a centre of excellence, often in collaboration with nursing excellence. These topics will be discussed later in this chapter; first we will focus on excellence in cardiology.

2.3.3. Cardiology excellence

An article by Manyazewal et al., although not specific to cardiology, provided a scoping review to "conceptualise centres of excellence based on global evidence" (Manyazewal et al., 2022, p. 1). The findings support the argument made in Chapter 1 that many institutions use the term "centre of excellence" as a label but do not use a framework that proves excellence has been achieved. Although many authors define their own framework, it seems each institution still has to build an individual level of excellence as there is no true comprehensive framework to follow. This scoping review suggests that now is the time that healthcare has a comprehensive model to follow so that the term centre of excellence is not a brand but an achievement from participating in an accredited process that gives them permission to use the term centre of excellence (Manyazewal et al., 2022).

Kouchoukos (2016) in his endeavour to become a "center of excellence" for cardiothoracic surgery argues the same concerns about the lack of definition and broad use of the term centre of excellence. He finds that centre of excellence is often used in specialties as a marketing term boasting infrastructure and services as the best available, but without the superior clinical evidence to support this tribute (Kouchoukos, 2016). Swaminath et al. (2015), however, backed up their accolade as a centre of excellence by creating their own model of excellence, and made their achievements transparent by creating a dashboard of key performance indicators aligned to their strategic objectives for their cardiovascular centre. Again, we hear the terms leadership, collaboration, education, and employee and patient satisfaction (Swaminath et al., 2015). So, providing excellent cardiac patient care is the same as most other healthcare specialities: we need to consider the patient voice and teamwork, particularly between doctors and nurses. This is determined by the organisational culture that provides resources, education and leadership support (Burnier et al., 2021).

So far, the cardiac areas pursuing excellence in the literature are cardiac surgery, coronary artery disease and hypertension. Another quest is for excellence in arrhythmia management, particularly atrial fibrillation (AF). By engaging stakeholders, including health practitioners, patients and hospital administrators, one centre of excellence is attempting to create an "integrated, coordinated and patient-centred approach" for quality patient care and management of AF (Sandhu et al., 2022, p. 1039). A comprehensive survey discovered the unmet needs, which led to the American Heart Rhythm Society making certain recommendations to improve care. To implement an AF centre of excellence, the major focus was on patients' perceptions and needs,

the need for a multidisciplinary approach, and administrative support with improved integration and appropriate referral and patient tracking resources (Sandhu et al., 2022). Although many clinicians were surveyed, it is disappointing that nurses were only mentioned briefly, even though the lack of nursing staff was reported as a barrier to attaining a centre of excellence.

Further analysis of these articles shows the benefits to quality patient care delivery by advanced practice nurses and how their patient advocacy and knowledge brings the multidisciplinary team together to deliver comprehensive care to complex patients (Lauck et al., 2016; Thomas et al., 2021). Appendix 3 defines the contributions to excellence found in the 10 cardiac excellence articles. These articles include the following major building blocks for cardiac excellence:

1. Using quality rigorous cardiac guidelines
2. Organisational leadership that supports change processes, patient-centred care, improved collaboration and communication
3. Research and education that promotes evidence-based care and certification for advanced practice
4. Fostering of a nursing workforce that retains and uses expert nurses for leadership and advanced clinical patient care.

Two more subthemes were included in this literature review. They were nursing leadership and nursing excellence. Articles were extracted from the healthcare excellence search; however, a separate dedicated search for nursing excellence was conducted, which is discussed later in this chapter (Section 2.5).

2.4. Leadership and workplace culture

The excellence in healthcare search identified major concepts of leadership and culture. We then conducted a search that looked more closely at how the organisation, its leaders and the inherent workplace culture influenced doctors' and nurses' delivery of timely patient care.

2.4.1. Search strategy

See Appendix 4 for the search strategy and PRISMA flowchart for this topic. Two databases were used to find more information specific to workplace culture and leadership. The PRISMA flowchart i explains the extraction of records. 46 articles were extracted.

Boolean phrases

ProQuest and CINAHL were searched using Boolean phrases:

(leadership AND “workplace culture” AND “organisational culture”) AND (“healthcare and hospital”) AND (“nurs* or doctor”) NOT (“medical students” OR dentist OR “allied health”)

And

(leadership AND “workplace culture” AND “organisational culture”) OR (“healthcare and hospital”) OR (“nurs* or doctor”) NOT (“medical students” OR dentist OR “allied health”)

Both searches were filtered for articles in English, in journals only, and published in the last 10 years. Duplicates were then removed.

2.4.2. Findings

The use of AND and OR in the Boolean phrases had an opposite effect on search results in ProQuest and CINAHL (see PRISMA flowchart in Appendix 4). There were either too many articles to screen or too few. Eventually, ProQuest returned 169 articles, whereas even after reducing the number of major headings used in CINAHL, the search still returned more than 7000 articles. Therefore, the first 50 most closely matched to search terms articles, from the list, were scanned for each database. From these, 48 ProQuest articles and 24 CINAHL articles were manually chosen according to their titles in the database search results. Out of these 72 articles, 65 were screened for leadership and workplace culture, see Appendix 5. Ultimately 46 articles were eligible.

The main themes from the articles reviewed were:

- Nursing leadership
- Organisational culture
- Transformational leadership
- Behaviour change
- Patient safety and quality care.

2.4.3. Discussion

Nursing leadership

The literature supported previous discussions regarding the direct link between patient safety and nursing practice. Acknowledging that nurses lead this safety culture and empowering them to do so ensures a safe practice environment in healthcare facilities (Wang & Dewing, 2021). Also, nursing leaders that support the delivery of compassionate nursing care to the suffering patient can create a safe and caring workplace culture that can satisfy staff and patient wellbeing (Lown,

2021). An organisation that values nursing skills, knowledge and decision making and then empowers nurses to lead, not only from a managerial position but also from the bedside, will help improve patient outcomes and the delivery of excellent healthcare (Calzone et al., 2018). These findings are supported by articles showing that empowered, educated nurses deliver specialised, innovative and preventative care (Kvist et al., 2013; Landerfelt et al., 2020; Mendes & Fradique, 2014; Saleem et al., 2022; Simon et al., 2022). Nursing leadership will be further discussed in relation to nursing excellence in section 2.6

Organisational culture

The literature stated that healthcare organisations are responsible for supporting their leaders to create a culture where excellence can thrive. This means ensuring the detrimental effects of workplace bullying, hierarchical structures and poor safety reporting practices do not exist, while encouraging open, positive, trusting relationships between healthcare team members, including junior and senior staff; inspiring innovation; providing education; and valuing staff contribution to safety reporting and quality patient care (Ayisha Adeeba et al., 2022; Cartland et al., 2022; Dahinten et al., 2016; Erasmus et al., 2017).

Transformational leadership

The literature also specified transformational leadership as an important leadership characteristic that influences healthcare teams' delivery of quality patient care. Defined by Doody and Doody (2012) in relation to nursing leadership, transformational leadership is the modern method for positively influencing workforce performance. Nurses follow their leader as a positive role model. They feel motivated to achieve personal and organisational goals, are empowered to implement evidence-based improvements through education and feel supported as an individual (Doody & Doody, 2012). The organisation needs to support nurse managers by teaching them transformational leadership skills as this will improve staff engagement and performance, which will ultimately improve patient care (Dawes & Topp, 2022; Labrague & Obeidat, 2022; Turunen et al., 2018).

Behaviour change

Leading and inspiring nurses and other healthcare workers to deliver excellence implies changing behaviour and thus practice to achieve ongoing quality patient care. Agnew and Flin (2014) studied how the behaviour of leaders influenced patient safety outcomes, highlighting the importance of education in leadership skills (Agnew & Flin, 2014). Others stress the importance of the skills of nursing leaders in determining how well nurses align their values, behaviours and

commitment to the delivery of quality patient care (Akbiyik et al., 2020; Al-Hussami et al., 2018). If ward practices are unsafe and detrimental to patient care, then it is the leader who needs to change the culture so that nurses and doctors "speak up and address outdated behaviours" to ensure patients receive quality care (Martin et al., 2014, p. 7). Either way, the literature emphasises that both the leader and the workers need to align their behaviour with the organisational and ward vision of providing excellence in patient care.

Patient safety and quality care

Excellence in healthcare is the delivery of safe and quality care at the highest level. The literature did not reveal any set formulae that create excellence, but showed it is influenced by leadership, staff behaviour and culture within the organisation as a whole and at the local ward level. However, the organisation that engages with their managers and ward staff, opening up two-way communication channels and creating trusting relationships and collaboration, can address patient safety and quality care, and then find a system that will sustain this culture within the context of their individual establishment (Churruca et al., 2021; Wynne-Jones et al., 2020).

2.5. Nursing excellence

The literature emphasises that nurses drive quality and thus the pursuit of excellence (McHugh et al., 2013). Nurse leaders like Clavelle and Goodwin (2016) created nursing models to support excellence in nursing care. The fundamental aspects of leadership that drive a model for achieving a centre of nursing excellence are those that support nursing education, practice and research, while empowering nurses to participate in the pursuit of quality patient care initiatives (Clavelle & Goodwin, 2016). This model is quite complex and can be seen in Figure 2.2.

Figure 2.2: Centre of nursing excellence model

Source: Clavelle and Goodwin, 2016, p. 614

We further reviewed the literature relating specifically to nursing excellence, including articles returned by the excellence in healthcare searches.

2.5.1. Search strategy

Database Searches

The original literature search for excellence in healthcare and cardiology extracted 24 articles on nursing excellence. These articles highlight how nursing leadership affects the organisational culture and how that, in turn, influences nursing performance and the delivery of quality patient care. Themes isolated from this group of articles were nurse decision making, leadership and workplace culture.

Two further search strategies were used for nursing excellence:

1. Searches in three databases (ProQuest, SCOPUS, CINAHL)
2. Keyword searches in EndNote (reference management software, version 20; Clarivate).

Again, searches were filtered to articles published in academic journals within the last 10 years (see Appendix 6). CINAHL provided the option to remove paediatric subjects, so only reports

involving adults only were chosen. This seemed to significantly reduce the number of search responses. The PRISMA flowchart in Appendix 6 shows the stratified results.

EndNote

Results of all literature searches were captured and categorised into groups in an EndNote library. The EndNote library already had groups for Excellence, and Leadership and workplace culture. Therefore, a keyword search for "nursing excellence" was done in EndNote to discover relevant articles in these groups (see EndNote search strategy in Appendix 6).

Once the ward round search was completed (discussed at the end of this chapter), the entire excellence and ward round search results were re-visited using Boolean phrases and keywords within EndNote for both nursing excellence and nurse decision making. A total of 372 articles were extracted from the groups searched in the EndNote library (refer to the PRISMA flowchart for the EndNote search in Appendix 6). Appendix 7 shows how the articles were screened. This process supplied 11 more significant articles, relating to Magnet hospitals, support for nurses and other related nurse decision making articles, totalling 57 nursing excellence articles. Articles were chosen due to their reference to how well nurses lead both clinically and within management to ensure patients receive quality and safe care.

Boolean phrases

1. ProQuest, SCOPUS and CINAHL databases: Nursing excellence (TITLE) AND healthcare AND (create or build)
2. EndNote: In "Any field": nursing OR excellence OR quality improvement OR collaboration
3. EndNote: In "Any field": nursing OR decision making OR collaboration OR empowerment.

2.5.2. Findings

There is much to read about nursing excellence in the literature. A total of 372 articles were reduced to 117 for screening, and then further narrowed down to 57 articles showing that nursing excellence is reflected in nursing leadership, both at the clinical and organisational levels. When empowered to make patient care decisions, nurses are recognised for their leadership and clinical decision-making skills that contribute to quality patient care and safety. Therefore, the three main discussion points will be:

1. Nursing leadership
2. Nurses and decision making
3. Nursing surveillance.

2.5.3. Discussion

Teams can deliver excellence when they have leaders that help them to function collaboratively. Nurses need to be valued and allowed to perform at their best to elicit more care and advocacy for the patient. A caring profession can also maintain excellence when their nursing leaders set examples for the team to follow, as well as appreciating the care and advocacy nurses already provide. Leaders that trust and allow their nurses to make decisions set up an environment that will create nursing excellence (Cole et al., 2014; Hardy Tabet, 2022; Hickey, 2017; Hitchings et al., 2012; Semroc & Prescott, 2019).

2.6. Nursing excellence endnote results

2.6.1. Nursing leadership

The literature reveals that nursing leadership comes in many forms:

- Transformational leadership
- Servant leadership
- Academic leadership
- Authentic leadership
- Digital leadership.

Benefits to patient quality care have been shown to occur when nurses display these leadership skills (Boamah, 2022; Burkoski, 2019; Glasgow & Colbert, 2022; Labrague et al., 2021; Shirey et al., 2019; Simon et al., 2022).

Nursing leadership does not only occur at the managerial and executive levels. If nurse managers are taught leadership skills, they can motivate bedside nurses to be more accountable for and interactive with team goals. Bedside nurses who belong to a team and workplace culture that allows them to challenge and enquire about evidence-based practice become better innovators and decision makers. This ultimately equates to improvements in the delivery of quality patient care (Bergstedt, 2020; Lucas, 2019; Sharma et al., 2018).

Leadership excellence is not only beneficial to patient care but also to the wellbeing of individual nurses. A resilient nurse who works in an environment of acceptance, support, compassion and trust is more likely to feel autonomous with their decision making and have a growth mindset that perpetuates the team goals and culture of delivering quality patient care. This environment, set up by good nurse leaders, ensures recruitment and retention of nurses with the right attitude and

motivation to achieve excellence in nursing care. Recruiting for the correct attitude, rather than skills, allows management to provide the appropriate educational resources and mentoring program to improve their nurses' decision-making and surveillance skills, which are needed to deliver good quality patient care (Akbiyik et al., 2020; Lown, 2021; Pullen et al., 2021; Wang & Dewing, 2021; Wang et al., 2021). As discussed in the previous chapter, CCU is struggling to retain cardiac trained senior nursing staff. Appendices 21 to 24 show the activity and staffing levels and the impact upon ward round attendance that existed at the beginning of this study. If we do not have the expert nurses working in the unit, then we will not be able to provide quality patient care (Bees 2017, Bender 2019) . So the availability of cardiac trained CCU nurses and their involvement in effective decision making processes needs to be considered when designing the new ward round.

2.6.2. Nurses and decision making

The combined EndNote library search found that positive communication and collaboration with doctors and the patient facilitates shared decision making that benefits patient care (Krairiksh, 2000).

Clinical decision making is complex. Experienced and specialist nurses have the knowledge, critical thinking and communication abilities to make appropriate clinical decisions to provide individualised care plans according to each patient's unique needs (van den Heuvel et al., 2022; Zondag et al., 2022). But as Nibbelink (2017) explained in her thesis, not all nurses are equal in their experience and knowledge. Working in a busy acute care environment does not always provide adequate time to communicate effectively with nursing peers and doctors. However, a healthcare workplace culture that isolates nurses from the ward round team may result in less informed decisions being made. Valuing nurses' observations, opinions and insight about the patient's needs and wants not only informed the ward round treatment plan but also instigated changes to the treatment plan according to changes in the patient's clinical condition over the 24-hour period. (Beck et al., 2015; Halverson & Scott Tilley, 2022; Stanton et al., 2001; Tang et al., 2018). Empowering nurses to make effective decisions may therefore influence the delivery of quality patient care and was addressed in our ward round study.

2.6.3. Nursing surveillance

Finally, Halverson and Scott Tilley (2022) support the literature's stance on nurses driving excellence. Their article highlights the importance of recognising the nurse's contribution to

patient assessment and progress in their care. However, nurses need leadership and an organisational culture that enables them to perform at the peak of their scope with the autonomy and empowerment to make effective decisions. Halverson and Scott Tilley's framework for nursing surveillance (Figure 1.6) shows that nurses that have this support will be able to deliver proactive care instead of reactive care. Poor outcomes eventuate from reactive care so this must be avoided. The design of the ward round using Halverson and Scott Tilley's model contains the elements required to ensure nurses avoid burnout, reduce adverse outcomes and improve the satisfaction of the nursing workforce (Halverson & Scott Tilley, 2022).

2.6.4. Summary

There was a heavy focus on nurses driving safe and quality care in the excellence in healthcare, leadership and workplace culture and nursing excellence and leadership literature search. Only three medical cardiac research articles relating to excellence in healthcare were found. It is obvious that collaboration between doctors and nurses is imperative for providing quality holistic patient care. Creating a positive culture where excellence can thrive needs supportive leadership and a vision that doctors and nurses can follow, to ensure practice changes reflect positive outcomes for their individual patients.

The literature on excellence in healthcare, leadership, workplace culture and nursing excellence has been thoroughly reviewed in the preceding sections. The next part of this literature review will look at ward round strategies and structures that have been used in the past, along with the ward round practices that have led to success and failure in the delivery of timely patient care.

2.7. Ward round study design concepts

2.7.1. Introduction

This research endeavours to evaluate how the re-engineered CCU ward round affects performance of clinicians and the subsequent impact on patient care. Re-engineering is defined in the "business sense as looking at a better way to design a process or workflow in the organisation" (Khodambashi, 2013, p. 950). Structural changes to the ward round are required to ensure a nurse attends the ward round and the whole healthcare team and patient are up to date with the current treatment plan.

As noted in Chapter 1, communication within the CCU interdisciplinary team is failing when responding to patient care and deterioration. This is likely impacted by the lack of nurse

involvement in the daily weekday ward rounds of the three cardiac streams. Appendix 23 shows the mismatch of nurses available for the three cardiac streams before and after the intervention. That is the acute coronary syndrome, arrhythmia and heart failure streams. Compared to the three cardiac streams that are staffed with a team of 3 to 4 doctors, only one nurse is available to join the cardiac stream ward round before and after the intervention. This literature review and analysis of ward round studies will provide the information and quality suggestions for strategies that can be used to restructure the CCU ward round.

2.7.2. Keywords and search strategy

An initial search found journal articles that had information about the "ward round". Further Boolean phrases were included to find the relationship of ward rounds with doctor and nurse communication, decision making and patient outcomes (refer to Appendix 8). An attempt was made to narrow the search to cardiology ward rounds and time efficiency. MeSH terms were chosen to specify patient rounds, organisation, culture, efficiency and time factors. The five major databases searched were ProQuest, CINAHL, PubMed, OVID and SCOPUS. Google Scholar and Google helped find the British NHS ward round guidelines that the articles spoke about and some additional grey literature. Keywords were similar to the search terms except checklist, proforma and multidisciplinary became more obvious. See Appendix 8 for the search process, with the inclusion and exclusion criteria for specific hospital ward round relevance.

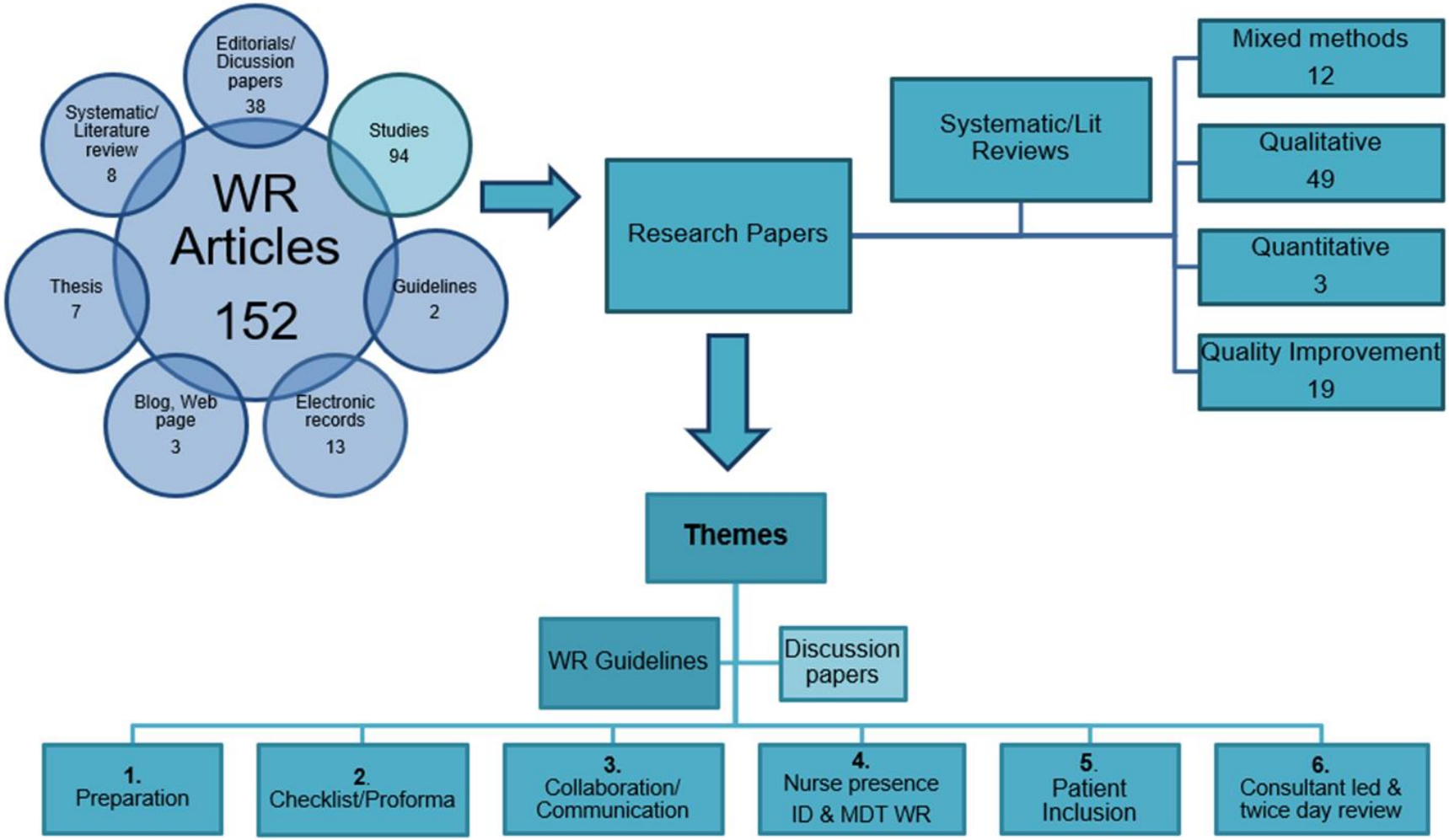
This search occurred during the design phase of the study and was completed in October 2021 prior to the ethics submission. Since then, a SCOPUS search alert for ("clinical decision making" AND "patient outcomes") AND (doctor and nurse) has produced 31 more articles.

2.7.3. Findings

Over 400 articles were returned in this extensive search; 152 articles were retained as they pertained to the ward round and/or interprofessional collaboration, quality and decision making. As shown in Figure 2.3, these articles were divided into seven categories:

- Guidelines
- Editorials and discussion papers
- Theses
- Systematic and/or literature reviews
- Studies
- Blogs or web pages.
- Electronic records

Figure 2.3: Ward round literature review organisational chart



ID = interdisciplinary; MDT = multidisciplinary; WR = ward round

However, among the 152 articles, only 29 ward round studies were found, with only four of those about a cardiology or intensive cardiac unit ward round: three cardiac-specific ward round studies and one cardiac and renal study (see Appendix 9 for the analysis of ward round studies).

It is important to note that the ward round interventions described in the literature provided a variety of quality improvement goals. However, this literature review showed that the extent to which the functional components are exercised in any given ward round to improve patient outcomes is not entirely clear.

It is rare to find rigorous randomised controlled trials regarding ward rounds. Most ward round projects use quality improvement and observational qualitative methodologies, and are performed by individual hospitals, wards and clinical services, using recommendations from the work done by the Royal College of Physicians (RCP &RCN, 2012, 2021b). The Royal College of Physicians recommendations will also be used in the design of the ward round study for this thesis. These guidelines show the positive results from 30 individual hospitals around Britain and Europe who have successfully implemented individual ward round guidelines into practice in the past (RCP & RCN, 2021a). Although a few studies show improvement in length of stay, there is a gap in the literature for the measurement of key clinical activities such as medication administration delays, procedure booking delays, fasting delays and patient education (Ahmad et al., 2015; Zwarenstein & Bryant, 2000).

Even though all 29 ward round studies we discovered had major findings, there were no definitive results to prove that each intervention would work if implemented in other hospitals. There was always the caveat that more research is required as these ideas and innovations need to be tested in individual hospital situations.

Reviewing over 100 articles and the included 29 ward round studies provided the major themes that will be used in the design of the re-structured CCU ward round. Six main themes were discovered from the analysis. These are:

1. Ward round preparation or pre-ward round data collection
2. Documentation tools: checklists and proformas
3. Collaboration and communication and post-ward round activities
4. Nurse presence/interdisciplinary/multidisciplinary ward round
5. Patient inclusion in decisions
6. Consultant-led ward rounds and returning for a second ward round each day.

Figure 2.3 shows how the themes and studies align. Appendix 10 presents a summary of findings within each theme from the variety of research and quality improvement ward round projects that many hospitals have undertaken.

To address these major themes, it is important to understand how ward round guidelines can be used to improve the current CCU ward round structure. The impact of the NHS guidelines upon British health delivery are discussed next, along with the relevance to Australian ward round practices.

Section 2.8 of this chapter will further explain the extraction of literature for the ward round design and the significance of the above themes taken from the literature.

2.7.4. Ward round guidelines

Many of the studies and discussion papers found in the literature refer to the two published ward round guidelines written by the Royal College of Physicians and the Royal College of Nursing, originally published for the NHS in 2012 and then revised as a report in 2021 (RCP & RCN, 2012, 2021b). Figure 2.3 includes the ward round guidelines as a major influence on the discovered themes of the search.

Many authors have used the NHS guidelines for further quality improvements and research in their own hospitals and institutions. In 2021, the two British colleges updated the document to recognise the current healthcare impacts of increasingly complex cases and COVID-19 (RCP & RCN, 2012, p. 299; 2021b). This work influences the study in this thesis because many of the recommendations can be adapted to the CCU ward round here in Australia.

Australia has also made recommendations on ward round structures similar to the 2012 NHS guidelines. A major incident in 2007 prompted the first Australian ward round recommendations to improve communication and teamwork amongst healthcare workers. The New South Wales (NSW) health department commissioned an inquiry into some harmful events that occurred at the Royal North Shore Hospital around 2007. Media reports and public outrage about a patient who had a miscarriage in the emergency department toilet prompted an investigation of hospital administrative and clinical culture. Commissioner Peter Garling published the inquiry report in 2008. The Garling report, as cited by Bradfield (2010), recommended the NSW health department address their culture issues by improving multidisciplinary teamwork and supervision of junior staff, and providing better ways of delivering the clinical handover. NSW hospitals were told to

conduct daily multidisciplinary ward rounds throughout the institution, not just in the ICU and CCUs. The report suggests employing checklists, consultant supervision, better communication, documentation and collaboration to improve quality in patient care (Bradfield, 2010; Garling, 2008). It is important for Australian hospitals to also continue efforts to monitor teamwork culture and methods of delivering the ward round to improve and maintain quality patient care.

Together, the Australian and British ward round guidelines encourage reforms to achieve best practice Some authors argue that governance, practicality and financial ability to enact these changes is sometimes lacking. In some ward round studies, system changes such as a new ward round design were locally driven without high-level leadership support (Bradfield, 2010; Pannick et al., 2016; RCP & RCN, 2021b).

Tables 2.1 and 2.2 show some of the measurements taken from ward round surveys and audits across the entire NHS, used to write the 2021 ward round guidelines.

Table 2-1: Number of patients per ward round

Percentage of specialties	Number of patients per round
55.5%	10–20
19.5%	<10
22.5%	20–30
2.5%	>30

RCP & RCN, 2021b

The greatest workload falls on 2.5% of ward rounds who can see more than 30 patients in 1 day. Most specialties see 10 to 20 patients per round (RCP & RCN, 2021a, p. 41).

Other surveys discussed in this document state that only 25% of ward rounds have the presence of a consultant during all weekdays, and half the consultants see their patients in up to four different wards. Nurses are frequently interrupted on the ward round more than the doctors, and the ward round itself is viewed by nurses as interrupting patient care (RCP & RCN, 2021a).

Table 2.2 shows the elements of the daily ward round and the role of the medical consultants in each of these. The consultants will mostly see the sickest patients and those for discharge rather than all patients. Communication with the consultant outside of the ward round is variable, but when consultants are on the ward round, they have a strong focus on education and reviewing medication charts.

Table 2-2: Communication and priorities of consultant rounds (RCP & RCN, 2021b, pp. 41–42)

Percentages	Board rounds or huddles	Ward round attendance	Teaching	Structured note taking
42% consultants	Yes			
21.9% consultants	Before and after ward round			
48% consultants	Only before ward round			
17.5% consultants	Only after ward round			
69.5% consultants	Debrief at the end of the ward round			
95.6% consultants		Only see sickest patients		
76.1% consultants		Discharges		
33% reported by nurses		No order to the ward round		
85% consultants self-perceived role			Active	
59.6% reported by physicians				Multidisciplinary record is in place
33.6% consultants				Use a checklist
1.7% physicians provide				Written summary provided to patients
88.3% consultants				Review drug chart

Further analysis of the ward round structures showed that communication and handover was done away from the bedside. A board round was undertaken by 42% of consultants. Only 42% of consultants participated in a handover process before seeing their patients; however, there was a stronger participation in discussions following the ward round. Teaching was viewed as a priority by 85% of consultants; however, it is the sickest patients and those being discharged who had priority for consultant review. Most consultants reviewed the drug chart. Almost 60% referred to a multidisciplinary document, although almost none of them wrote in the notes; and 33% of consultants referred to a checklist. Thirty-three percent of nurses voiced concerns about the lack of direction in ward rounds when physically seeing the patients (RCP & RCN, 2021a).

The NHS used this data to make recommendations to hospitals to improve the ward round processes in British hospitals. Most of their arguments were supported by qualitative studies that

provided expert doctor and nurse opinions about their workplace culture and the benefits of a re-structured ward round within the context of individual clinical units. To convince hospitals to adopt these recommendations, benefits to quality patient care arising from improved ward rounds needed to be more visible. For example, the summary of findings from the NHS Seven Days a Week Forum included not only patient satisfaction findings but also quantitative analysis of mortality rates, length of stay and readmission rates to bolster their argument for a 7-day consultant ward round service (NHS, 2013).

Analysing previous ward round studies, information and quality suggestions provided strategies for the restructure of the CCU ward round. It also demonstrated it was prudent to measure other patient outcomes and key clinical activities, such as time delays for medications, fasting and bed rest, which have not been measured in the literature.

2.8. Literature extraction for the ward round design

The following discussion highlights the important design elements that were extracted from the literature search and later used to create the intervention. The methods chapter of this thesis will explain the intervention design further. From the NHS guidelines and themes identified in the literature search, the following strategies within each theme were adapted to the CCU ward round as follows:

Ward round preparation or pre ward round data collection:

Improve handover and pre-ward round communication

Documentation tools: checklists and proformas:

Improve ward round documentation

Collaboration and communication and post-ward round activities:

Improve interdisciplinary teamwork inside and outside of the ward round; include a post-ward round debrief

Nurse presence/interdisciplinary/multidisciplinary ward round:

Ensure nurse attends the ward round

Patient inclusion in decisions:

Facilitate patient advocacy

Consultant-led ward rounds and returning for a second ward round each day

Improve senior support and leadership.

This descriptive literature review will analyse the above components that will improve patient safety and quality care ("Colleges Recommend Changes to Ward Round Arrangements," 2012). Evidence for the success of the NHS ward rounds was how local stakeholders adopted the strategies into their everyday practice throughout Britain (Soliman et al., 2013). Similarly, in this thesis, observing the CCU ward round practice 1 year following the initial study intervention showed which strategies the local stakeholders adopted.

2.8.1. Ward round preparation

As stated in the previous chapter, the current Australian communication clinical standard includes adequate handover practices (ACSQHC, 2020). This strategy enables doctors and nurses to discuss and update each other about patient care, away from the bedside. Citing Sorra et al.'s (2016) guide on patient safety culture, Angelopoulou and Panagopoulou (2019) state:

> "Non-clinical rounds are considered essential in establishing a patient safety culture, which requires staff to establish communication, mutual trust, and shared perceptions of quality, well-being, and safety" (Angelopoulou & Panagopoulou, 2019, p. 605).

> "Despite their identified importance for quality care and patient safety there is a lack of systematic framework for the development, implementation and evaluation of non-clinical rounds in hospital settings" (Angelopoulou & Panagopoulou, 2019, p. 605).

Improving ward round and handover practices provides the team with enough information to conduct the ward round, discuss treatment options with the patient and devise an up-to-date treatment plan. Priorities are better understood, especially for those patients who are the sickest or for discharge (Rai & Browning, 2020). Also, collecting the relevant patient information prior to the bedside review is more efficient and reduces delays in decision making that occur when more information is required for the patient's treatment plan. The electronic medical record (EMR) supports a better-informed ward round team and reduces the time taken to collect all the information (Fernandes & Eneje, 2017).

2.8.2. Improved ward round documentation: the checklist and proforma

Checklists are seen as a quality marker because they remind clinicians of all the required elements to include for safe patient care. Proof that checklists work as a safety and quality marker is seen in the World Health Organization's endorsement of compulsory surgical checklists for operating theatres as they lower patient post-operative complications and death (Blucher et al., 2014). According to Shetty et al. (2018), using checklists on the ward round acted as a reminder and

diminished omissions in patient care, thus benefiting patient safety (Shetty et al., 2018). A variety of British physicians started using checklists for the ward round from 2010 to improve patient safety standards. Many authors have observed the effect of ward round checklists in a variety of clinical settings, including one cardiology ward (Hale & McNab, 2015; Herring et al., 2011; Read et al., 2021). Although qualitative results profess checklists as a tool for safety and quality, because they improve documentation, these studies lack the rigour of scientific proof to convince clinicians that checklists change patient outcomes.

A ward round proforma incorporates the checklist into a specific ward round documentation template (Dewson et al., 2020). The proforma is a way of standardising the ward round notes, ensuring all important aspects of care have been addressed. Patient care is complex. CCU cardiac streaming divides patients into three cardiac diagnostic groups because they require different treatment goals and regimens (Chew, Horsfall, et al., 2016). The challenge is to create a "one size fits all" paper document that can be adapted to all the CCU cardiac streams. EMRs may be easier to adapt for each diagnostic group as they can have their own individual template (De Bie et al., 2021). Simplicity and precision assist the end user's ability to engage with the tool and cover all the important and necessary care requirements. Again, reducing omissions by improving the quality of documentation is said to improve patient safety (Krishnamohan et al., 2019; Shetty et al., 2018).

Dewson et al. (2020) highlight that the principal feature of good communication is quality documentation in the patient record. The record can be accessed 24 hours a day, thus enabling information transfer to enable effective clinical decisions. The proforma removes the variation in writing and provides a standard documentation method that makes it easier for others to understand the patient's treatment plan. Dewson et al. (2020) state that, in their study, the evidence of accurate completion of the clinical assessment sections of the document was significant; however, there were no benefits to patient outcomes such as venous thromboembolism (VTE) prophylaxis, escalation of care and antibiotic use. This quality improvement project convinced the colorectal department of their institution of a better way to document patient care, but clinicians were not convinced about the proforma's longevity (Dewson et al., 2020, p. 1).

It is the clinicians that are expected to engage with and use documentation tools such as checklists and proformas. There are conflicting arguments from the stakeholders who document the ward

round note about the benefits and pitfalls of these tools. Shetty et al.'s (2018) reference to checklists in surgical wards found that these constant reminder checklists irritate senior staff as they are time consuming and create task-orientated care that focuses on the paperwork rather than the patient (Shetty et al., 2018). In contrast, junior staff enjoy the reminders about clinical care when working in acute areas and patients perceive improved care with the use of checklists (Hale & McNab, 2015; Read et al., 2021). Gilliland et al. (2018) found that compliance improved over time, and felt that quality of care was improved when the document was completed. Documenting VTE risk assessment, clinical observations and antibiotic use were considered quality indicators that could impact patient outcomes; however, they were not directly measured (Gilliland et al., 2018). One therefore must consider whether ward round documentation compliance affects CCU patient outcomes.

Despite concerns about compliance, Krishnamohan, Maitra and Shetty (2019) went on to implement a daily six-item surgical ward round checklist and compare patient adverse events before and after use of the checklist. The six checklist items were prescribed VTE prophylaxis, review of antibiotics, fluid balance, blood tests, patient observations and drug chart. With use of the checklist, there was a notable drop in prescription errors, with no reported antibiotic, fluid balance and patient observation errors; VTE cases dropped slightly from 11 to 10 between January and August 2016, following the implementation of the checklist (Krishnamohan et al., 2019). The small numbers in this study did not provide a convincing argument to change practice, although, at the local level, it was suggested that the surgical unit strive to promote the tool for a longer time and assess outcomes from a larger cohort of participants. Conroy et al.'s (2015) "single-site, before–after prospective intervention" using an ICU checklist found it to be a good audit tool; however, more powerful evidence was required to convince other sites. They suggest a randomised stepped wedge cluster design might be a better research design. Comparing the use of their tool in multiple ICUs at other hospitals and randomising patients to control and intervention groups may "detect significant patient outcomes over time" (Conroy et al., 2015, p. 11).

According to the studies, ward round checklists may avoid patient care oversight and proformas may clarify documentation; however, evidence to support benefits to direct patient outcomes would improve the rigour of these studies (Wright, 2009). Qualitative anecdotes, audits and local satisfaction surveys serve to engage stakeholders in the process, but may not always convince the establishment to enforce permanent use of these tools.

The CCU in this thesis study did not use a ward round checklist or proforma prior to the intervention. Medical staff use the SOAP acronym to document patient assessment on the ward round. SOAP is a structured method, with the acronym standing for S:subjective data, O:objective data, A:assessment and P:plan (Dolan & Broadbent, 2016). "It is based on a problem-oriented medical record format" that helps doctors focus on patients' primary complaints and categorise other patient information (Abraham et al., 2016, p. 2). The SOAP acronym relies on individual interpretation and does not follow a diagnostic pathway; therefore, a cardiac-specific ward round proforma incorporating cardiac care reminders, such as cardiac rehabilitation and driving restrictions, could improve the quality of documentation and communication among the CCU doctors and nurses. A proforma was therefore entered into the study design.

2.8.3. Collaboration and communication

As mentioned earlier, a workplace culture that fosters trust and respect amongst its members will alleviate anxieties about contributing to patient care discussions. Unfortunately, the traditional healthcare environment supports a hierarchical decision-making process that prevents interaction between junior and senior doctors and nurses (Collin et al., 2015). In addition, it is not only the doctors and nurses who are a part of this process but also the patient, which is discussed further in Section 2.8.5.

Staff may not understand their roles and responsibilities when contributing to the ward round. Leaders of the organisation may have to clarify their expectations to support a better culture of interdisciplinary teamwork. Nurses are the drivers of quality that influence better communication between disciplines (Desai et al., 2011). According to a Cochrane review in 2000, there was limited rigorous research regarding collaboration between doctors and nurses that directly affects "both the quality and the efficiency of patient care" (Zwarenstein & Bryant, 2000, p. 3). Unfortunately, current literature continues to confirm these comments and team collaboration at the bedside is still considered a challenge today (Walton et al., 2019a).

In practice the ward round extends past the bedside meeting as decisions are updated throughout the day. The acute cardiac patients in CCU have complex needs and many of them required further clinical reviews. If the decisions and goals of care were not updated or communicated, medical and nursing staff did not make well-informed decisions. That is why the NHS has suggested a practice of multidisciplinary team gatherings should continue after the ward round is completed. This ultimately ensures the patient and family are updated on the patient's progress (RCP & RCN,

2021a, 2021b). Again, this was taken from qualitative analysis of NHS staff interviews. However, in one case study at the Wrightington Wigan and Leigh NHS Foundation Trust, 95% of "drug errors/omissions, medical and nursing staffing issues, [and] patient complaints/concerns" were resolved with post-ward round 30-minute safety meetings (RCP & RCN, 2021b, p. 17).

2.8.4. Nurse presence

Manias and Street (2001) highlight the historical evidence that ward rounds were dominated by doctor and patient interactions. They studied the contribution that nursing colleagues made to the critical care ward round, by exploring the culture of doctor–nurse collaboration. They found that nurses did not feel included in the discussions, especially when doctors would continue the patient review without waiting for the nurses to attend (Manias & Street, 2001). Nurses were intimidated and less empowered to speak up on a physician-led ward round (Bradfield, 2010; Manias & Street, 2001). There were also other barriers to nurses contributing to the ward round. Zamanzadeh et al. (2021) discovered in their own literature review that the main barriers could be grouped into four categories:

- Limited time and availability
- Lack of enthusiasm to contribute
- Poor interaction between members
- Organisation and management (Zamanzadeh et al., 2021).

When senior nurses as leaders were empowered to speak up and include themselves in the bedside conversation with the patient, they not only provided a patient voice, but also facilitated junior doctors' capacity to "speak up" and communicate with senior medical staff (Kurhila, 2020). This is known as situational awareness (Beck et al., 2015). More than completing tasks, situational awareness can use the nurse's abilities and skills to help teach and support patients and junior doctors. This creates a better team culture, avoiding the traditional hierarchical behaviour, where everyone listens without question to consultants and senior staff (Johnson et al., 2017).

A multidisciplinary team of allied health professionals as well as pharmacists were recommended to attend the ward round as each member had a different perspective of patient care (Bullock et al., 2019; Walton et al., 2016). If situational awareness exists within the whole healthcare team, throughout the patient's episode of care, then adverse events can be reduced and higher quality care provided to the patient (Beck et al., 2015; Edbrooke-Childs et al., 2018).

Triggle's (2012) discussion agrees with the NHS recommendations to include nurses on the ward round. This is because nurses have a 24-hour insight into patient care and have valuable information about them and their families that is vital for the ward round when making clinical decisions (Triggle, 2012). The challenge is to allow all levels of hierarchy between CCU doctors and nurses to feel comfortable enough to articulate opinions and participate on the ward round, enabling a culture of teamwork that promotes effective and collaborative decisions and includes the CCU patient's involvement in the bedside discussion. Triggle (2012) considered the original NHS ward round guidelines which emphasised the importance that nurses should place on ward rounds, how ward rounds are structured within the ward, and that the organisation should support nurses attending the ward round (Triggle, 2012). Nurses can then take leadership within the team to promote better understanding of patients' needs. Again we must revisit CCU's plight in this study where there are a minimum of two cardiac trained nurses rostered to each shift. Staffing issues may impact the study if we cannot find three cardiac trained nurses to attend each of the three cardiac stream ward rounds.

2.8.5. Patient inclusion

Weber et al. (2007) looked more closely at doctor and nurse interactions and how this positively affects patient involvement (Weber et al., 2007). Patient interviews showed that patients feel nurses are more approachable and easier to understand than physicians. Swenne and Skytt (2014) agreed with these findings; however, theirs was only a small sample of 14 cardiology patients. Sometimes patients preferred to take a passive stance on ward rounds, whereas others were more active in making decisions about their treatment plan. Surveys found that even if the patient did not interact with the ward round team, they still wanted to be fully informed and involved in their own care. As mentioned previously, it is the nurse who could navigate the patient perspective and facilitate their contribution to the bedside meeting. This means the nurse has to provide further explanation to the patient after the ward round (Lees, 2013; Swenne & Skytt, 2014).

Clay-Williams et al. (2018) also confirmed Weber's findings. A structured ward round intervention in an Australian acute medical unit (AMU) revealed more trusting relationships and better patient advocacy during interdisciplinary ward rounds. This study used qualitative and quantitative measures to analyse the modified ward round intervention. The quantitative analysis of hospital outcomes rather than patient outcomes was viewed as a measure of quality. Using the new ward round model succeeded in reducing the overall cost of stay from A$5.67K to $4.64K ($p<0.001$).

There was also a significant reduction in the number of calls per month for patient review (mean of 63.1 to 31.5, p=0.004 in the AMU), but the patient length of stay remained stable (2.16 to 2.15 days, not statistically significant). Observed changes in power dynamics towards nurses during ward rounds were noted in this study. Nurses began regulating the workflow and increased their participation in ward round discussions as they became more confident in their relationship with the interdisciplinary team (Clay-Williams et al., 2018). Afterall, nurses do have a responsibility to advocate for the patient by asserting themselves within the team and ensuring they are heard (Peate, 2021).

In summary, these studies found that the ward round provides the structure of face-to-face communication, which promotes relationships and a cohesive culture of trust within the team. Most of the literature confirms that nursing staff presence in the interdisciplinary ward round team is compulsory for the delivery of quality patient care (Clay-Williams et al., 2018; Tang et al., 2018; Weber et al., 2009).

The challenge for this thesis project was rostering three cardiac-trained nurses, allied health professionals and pharmacists who can dedicate their time for each of the streams doing a morning ward round in CCU.

2.8.6. Consultant-led ward rounds

Senior medical and nursing decisions made on the ward round provide leadership and guidance for the interdisciplinary team (Moroney & Knowles, 2006; Walton et al., 2019a). This creates an atmosphere that provides education, values opinions from all members of the team as well as the patient, and promotes a positive, accepting culture that fosters quality, holistic patient care (Rajasoorya, 2016; Walton et al., 2016; Walton et al., 2020).

A key principle of the ward round report by the Royal College of Physicians (2021) is the importance of ward round leadership, especially for consultants to manage the bedside ward round and review patients within a 14-hour time frame (RCP & RCN, 2021b). The report emphasises the need for ongoing patient assessment outside of the ward round and the availability of senior clinical decision support that was not limited to the allocated ward round time (RCP & RCN, 2021b). According to the report, hospitals used this principle in a variety of ways. Some examples included:

1. Role reversal
2. Collaborative practices
3. Board rounds
4. Electronic tools (RCP & RCN, 2021a).

Evidence of success was limited in the 2021 ward round case study report; however, statements reporting improvement of "key elements on inpatient care" following structural changes, including consultant-led elements, did not show statistical data (RCP & RCN, 2021a, p. 3).

Twice-daily consultant round

Ahmad et al. (2015) reported significant cost savings over a 2-year period by ensuring consultant rounds for two general medical wards occurred at least once, if not twice, a day. These cost savings resulted from a reduction in unnecessary investigations and pharmacy costs. Length of stay was reduced by "almost half" and patient throughput increased by 70% (Ahmad et al., 2015, p. 1). Improved consultant attendance on the CCU ward round was considered beneficial to clinical decision making for the design of the CCU ward round study.

In a study conducted by Reddin et al. (2019), cardiology and urology patients in an Irish hospital were surveyed to measure communication and education provided on the ward round, particularly in relation to the patient–doctor relationship. Out of 98 cardiology and 78 urology patients, 30% of cardiology patients did not feel they completely understood their diagnosis, as opposed to 19% of urology patients. The cardiac patients had more complex diagnoses, which might have influenced the ability for patients to understand the ward round discussion. Interestingly, a ward nurse was part of the bedside team, but was only mentioned as present and nothing was stated about the nurse contributing to the ward round discussion. It was interesting that the urology team completed a second ward round at the end of the day. Patients felt they could better understand their treatment plan as the follow-up discussion enabled patients to "consolidate and question their diagnosis and treatment plan with their doctor" (Reddin et al., 2019, p. 1125).

2.9. New ward round study library alerts

This literature search was completed in October 2021 when the study protocol and design was finalised and ready for the ethics submission. An ongoing library alert was put in place to provide up-to-date research for this thesis, from which a total of 31 extra articles were made available. Most of them refer to physician or nurse decision making. Only one article contained findings from new cardiac ward round research.

This study, Li et al. (2022), evaluated a communication tool used by nurses on the integrated medical and nursing ward rounds for patients undergoing percutaneous coronary intervention in a Chinese hospital. This communication tool asked nurses to cover five main modes of communication – Acknowledge, Introduce, Duration, Explanation and Thanks (AIDET) – when speaking with the patient and during the ward round. Even though this was a small study, prognostic benefits were gained through improved communication processes between nurses and patients and between nurses and doctors, as well as improved patient self-care and relationships between nurses, patients and doctors (Li et al., 2022). This reinforces the importance of communication and collaboration between doctors and nurses and the contribution the nurse/patient relationship makes to patient advocacy.

2.10. Summary of literature search

In an attempt to build excellence, there were two major sections in this literature review: excellence, and the design of the ward round study. The excellence search analysed nursing's contribution to creating excellence by searching the following themes:

1. Leadership and workplace culture
2. Nursing excellence
3. Nurse decision making and surveillance.

One article that summarised the pursuit of excellence was written by Patricia A Hickey (2017). She discussed the factors that contributed to her receiving an excellence award for cardiovascular nursing. They were her "role models/mentors, the profession and its impact, teams and environments of excellence, and including the future" (Hickey, 2017, p. 721). She acknowledged the duty of leadership to create an environment in which there is investment in the nursing profession by providing education and support for nurses to design their own staffing models and work at the top of their scope of practice. This environment created by leadership provides a setting for compassionate and vested healthcare teams to work within a positive workplace

culture that supports team collaboration. Finally, excellence in healthcare is ensuring the patient is at the centre of decision making, as it is the continual success of patient care that determines an organisation's reputation as a centre of excellence (Hickey, 2017).

Little did we know that this literature review would yield few proven ward round strategies that make a significant difference to patient outcomes. The literature showed promising effects on workplace culture and patient satisfaction, but no scientifically proven methods that can be translated into worldwide ward round practice (Desai et al., 2011; Peate, 2021; Reddin et al., 2019). Therefore, the variety of ward round ideas found in the literature need to be tested in individual clinical contexts to see if they work.

With any newly designed ward round process, stakeholders will be required to work within the new process and comply with the new ways of working, e.g. starting at a certain time, all members attending the ward round and team huddles. This means changing practice (Engl et al., 2019; Singh, 2013). If the ward round intervention in this thesis study is proven to be successful, this practice change needs to be sustained. Therefore, changing and sustaining practice is a concept that needs to be explored further. The next part of this chapter will discuss the theoretical framework that is required to guide this research.

2.11. Conceptual or theoretical framework underpinning the thesis

Finally, an appropriate conceptual framework was chosen to explore behaviour change that accounts for compliance with the ward round design, and facilitates an understanding of how and why doctors and nurses behave on the ward round. It is hoped that this understanding will help to sustain the delivery of excellence in patient care.

Finding the conceptual framework?

Many concepts and theories, such as organisational change theory and the theoretical domains framework, were explored to determine the correct path for this study. A literature search discovered a lot about organisational and group development theory (see Appendix 11); however, the major concepts and framework for this thesis came from the desire to understand how teamwork and behaviour influences effective decision making. Therefore, the theoretical framework underpinning this thesis lies in understanding the causal factors for effective decision making and how behaviour change and situational awareness affects the workplace culture. This thesis does not mean to exclude the influence that organisational change theory has on this study,

but rather looks more closely at the power the organisation's leaders and how this influences staff behaviour.

Resistance to change is common and, in other studies, staff did not always comply with changes in workflow (Andrews et al., 2008, p. 306). As with patient resistance to health advice and lifestyle change, resistance to behaviour change occurs in health professionals when they are asked to adapt to policies, procedures and evidence-based innovations promoted by the organisation to maintain best practice and quality patient care principles (Bull et al., 2019; Michie et al., 2011). Therefore, compliance issues were to be expected in our ward round study.

Steinmo et al. (2015) explain the variety of behaviour change models and tools that can be combined to analyse behaviour change. These are:

1. The behaviour change wheel
2. Behaviour change taxonomy
3. Theoretical domains framework (Steinmo et al., 2015).

This study analysing professional behaviour showed the complex nature of implementing evidence-based sepsis care into practice. Understanding the mechanisms that drive behaviour change will improve successful intervention implementation (Steinmo et al., 2015). The behaviour change wheel captures these mechanisms.

The chosen concepts for this thesis

2.11.1. The behaviour change wheel

The three layers of the behaviour change wheel rely on the core components of capability, motivation and opportunity; each one can be targeted according to the intervention design. This thesis is considering aspects of workplace culture that is influenced by the environmental and social opportunity affecting how people think. The framework incorporates intervention functions and policy categories onto its outer layers to allow for the variety of objectives that could influence behaviour, especially in relation to public health. See Figure 2.4 (Michie et al., 2011).

Figure 2.4: The behaviour change wheel (Michie et al., 2011, p. 9)

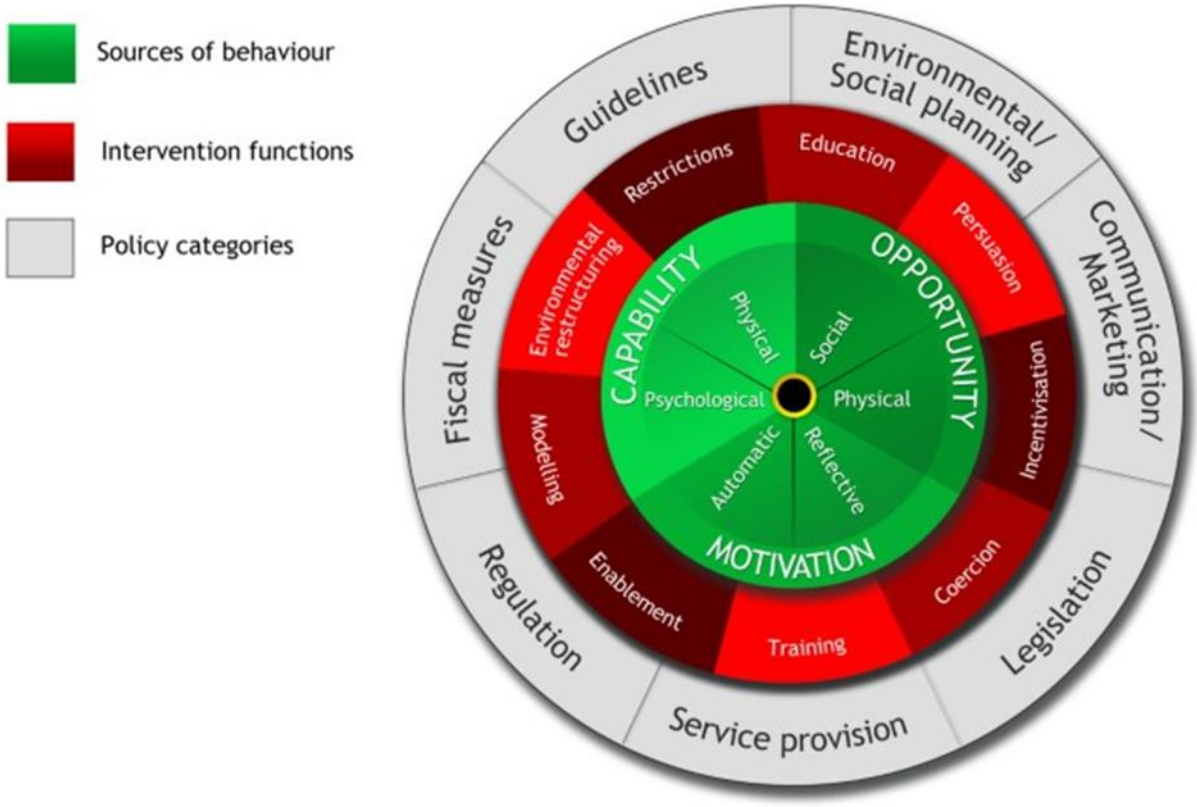


Figure used with Open Access permission

Kredo et al. (2018) examined the barriers presented to healthcare staff when implementing clinical practice guidelines, and found that although there was a high level of motivation amongst the clinical staff, they came across systemic barriers that affected appropriate use of the guidelines. Two particular barriers were the lack of training and the perceived lack of teamwork. These became enablers when leadership adequately attended to these two elements. Again, we note that the cultural environment found in the social and physical opportunity component of the wheel played an important part in teamwork and leadership being enablers for the use of clinical practice guidelines (Kredo et al., 2018).

Bonaconsa et al. (2021) recently published a new analysis of the ward round group dynamics in relation to antibiotic stewardship. They reinforced that a culture depending on hierarchy-dominated decision making, by consultants and registrars, prevents nurses or other healthcare team members, as well as the patient, from participating in the bedside discussion. They even showed that medication administration can be delayed by up to 24 hours due to the failure of doctors to communicate and collaborate effectively with nurses when writing new drug orders (Bonaconsa et al., 2021). This highlights the need to address culture through the behaviour of doctors, nurses and patients. The behaviour change wheel shows that focusing on the physical and social environment creates opportunity for staff. The organisation and team leaders need to consider staff education, persuasion, incentives and coercion, while acknowledging the external influences of how to legislate, market, communicate and plan for the intervention, to ensure the intervention's success. Leaders who allow team members to collaborate and communicate their ideas within a "dynamic environment" facilitate better decision making; this is known as situational awareness (Beck et al., 2015, p. 1402).

2.11.2. Situational awareness

Situational awareness is defined by Reader et al. (2011) as a person's contextual interpretation of the environment and understanding of the information in that moment that allows them to anticipate future consequences of the current circumstances (Reader et al., 2011). This leads to the ability to make decisions and take correct action in that situation (Beck et al., 2015). It is this aspect of team culture that permits members to participate and learn about clinical decision making. The study in this article encouraged all team members to have their say in ward rounds so that vital information was not missed. But all nurses did not necessarily speak up during the ward round or even feel their opinion was valued by the medical staff, especially the consultant. In a hierarchical culture, nurses have developed an indirect way of delivering important information and influencing doctors' clinical decisions so that patients receive safer care. Unfortunately, this hierarchical nature of ward round teams affects free speech between doctors and nurses. As discussed earlier, not only can patients feel intimidated by the ward round team, but the junior doctors and nurses can be reticent to join in the treatment plan discussion with senior doctors (Kurhila et al., 2020). It is likely that organisations prefer to encourage protocol- and policy-driven care; however, these protocols and policies may not suit the individual patient's needs or could put them at risk of harm. When a consultant is not advised of the whole patient story, they can make uninformed decisions. It is up to the nurse or doctors present during the ward round to alert

the consultant, thus turning the interaction from task management into a holistic situational awareness event. Therefore, as in the aviation industry where the pilot relies on his crew to indicate any “red flags”, the concept of situational awareness can be applied to the healthcare environment to improve effective decision making (Wickens, 2002). This is especially true for the more experienced nurse or doctor.

The experienced cardiac nurse or doctor can pick up cues and elicit the complete information required to inform clinical decision making. Some of these cues may not overtly show up in routine early warning systems. It is the empathetic and compassionate nurse or doctor who sees a patient grimacing or appearing upset, or detects a telling change of tone in their communication, and uses this to trigger further enquiry, inside and outside of the ward round. Using their heart and mind together gives nurses and doctors the intuition to sense not only physical patient suffering but also emotional distress. Unfortunately, in our busy, high acuity CCU, this skill was underdeveloped in the junior nurses who were delivering more bedside care than the experienced cardiac-trained nurses. This was a concern as the delivery of quality patient care was currently diminishing due to the high cardiac-trained nurse attrition rates (Currey et al., 2019; Halverson & Scott Tilley, 2022). When given the opportunity, it is nurses who advocate for their patients’ needs to the ward round team and can contribute necessary clinical and patient information omitted from the ward round discussion. This is situational awareness in practice. We hoped that embedding this culture in our environment would contribute to effective decision making.

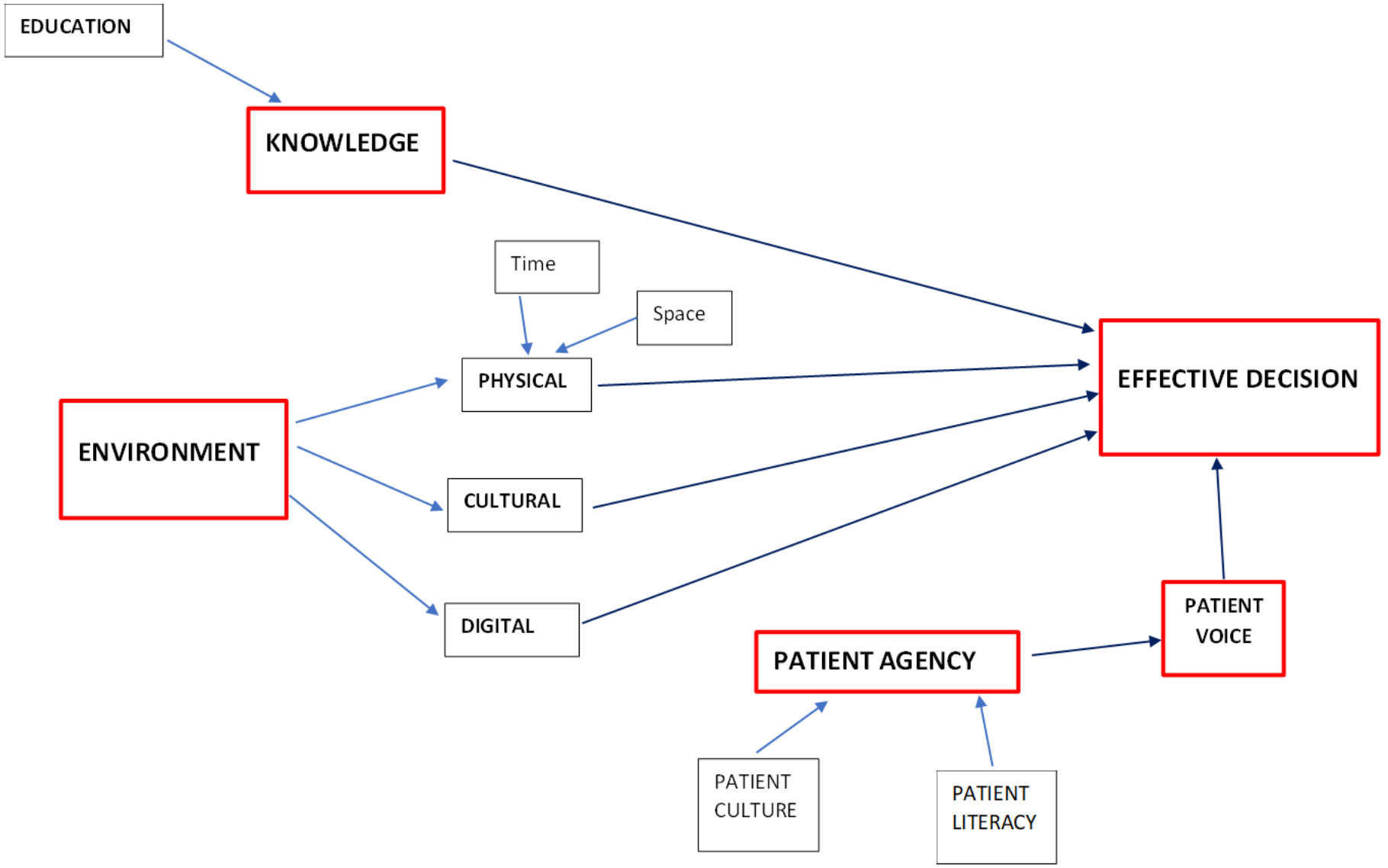
2.12. The effective decision

To apply all the above theoretical concepts, a visual representation of effective decision making on the CCU ward round was created in a "directed acyclic graph", as discussed in the next section.

2.12.1. Directed acyclic graph

Confidential departmental clinical review meetings in 2019 and 2020 regarding serious after-hour patient events and a decline in mortality of cardiac patients presenting with myocardial infarction prompted a need for our cardiology department to investigate the cause of these events (Fraser, 2016). While interdisciplinary ward rounds are well established as the "golden rule" for quality patient care, implementing them into daily ward round practice in CCU has been a struggle, as reflected by many ward round interventions from around the world (Coombs, 2003; Gurses & Xiao, 2006; Smith et al., 2019). The ward round focuses on clinical decisions; therefore, to understand how these decisions are delivered and what factors influence them, we wanted to find the "causal effect of an exposure on an outcome" (Hernan & Robins, 2006, pg 360). We designed a causal diagram to illustrate the likely variables that would influence an effective clinical decision on the CCU ward round. See Figure 2.5. This diagram is called a "directed acyclic graph", or DAG (Cañón-Montañez & Rodríguez-Acelas, 2019, Textor et al., 2016, pg 1887). Although the use of a DAG may be seen as a tool rather than a theory, DAGs are helpful in illustrating each confounder's one-way relationship and exposure to the outcome. The DAG can assist with the analysis and provide context to the question at hand (Pearce & Lawlor, 2016). The DAG that we created fed into the design and hypothesis of the ward round intervention.

Figure 2.5: Directed acyclic graph for an effective decision on the CCU ward round



2.12.2. How to apply the directed acyclic graph to guide the ward round

The group dynamics between CCU doctors and nurses and how they respond to each other determines how each discipline responds to patient care concerns. It is the culture and responsiveness to communication that determines patient safety (Gurses & Xiao, 2006). Teamwork in this interdisciplinary group is determined by the respect, trust and confidence of its members to not only speak up about the patient but also listen to each other. The ward round is a controlled, routine time and space that doctors and nurses meet, communicate and discuss patient care. This is an opportunity for interdisciplinary discussion, in front of the patient, where clinical decisions are produced (Coombs, 2003; Gurses & Xiao, 2006; O'Leary et al., 2019; Smith et al., 2019; Walton et al., 2019b; Weber et al., 2009). Coombes (2003) confirms this author's belief that it is the senior cardiac nurse that shows more confidence and can articulate patient needs better than a less experienced nurse who prefers to get on with the tasks at hand and avoid the ward round discussion (Coombs, 2003). This is because the senior nurses have a rapport with the cardiologists and registrars, whereas other nurses feel intimidated by them. This is exacerbated by a rotational medical and nursing roster (Zamanzadeh et al., 2021). For this reason, the DAG captured culture, teamwork and communication as elements of the ward round environment in the environment part of the DAG.

Another major component of the ward round required for an effective decision, as displayed by the DAG, is patient involvement. As an advocate for the patient, nurses present during the ward round facilitate the patient voice, which contributes not only to patient safety and quality care but ultimately helps the patient to be more involved with the ward round discussions and thus decisions about their care while in hospital (Boyal & Hewison, 2016; Coombs, 2003). Before this thesis study, CCU had up to three cardiology teams on ward round simultaneously, with only one cardiac nurse coordinator available to attend all three ward rounds. Patient care nurses were busy delivering care and facilitating patient flow. These nursing activities were prioritised above ward round attendance due to bed management and workload demands (Zamanzadeh et al., 2021). Unfortunately, nurses tend to underestimate the benefits of patient advocacy and the value of their contribution to ward round discussions (Walton et al., 2019a). Patients who cannot articulate their concerns appreciate nurses being on the ward round, as long as the nurse is a good communicator and conscious of individual patient needs (Larsson et al., 2011). Knowledge, experience and skill of the healthcare professional can break down barriers to communication.

Knowledge is the third major part of the DAG. This includes not only the level of education but also the amount of clinical experience each ward round member has. The CCU ward round usually had a cardiologist, registrar, RMO, intern and hopefully a cardiac nurse. However, both cardiac nurse and cardiologist attendance was intermittent on the CCU ward round. Promoting a culture that values the contribution of all ward round members, despite their training and level of expertise, was captured on the DAG to promote better team synergy (Braithwaite et al., 2017). Studies have shown that organisational support for the presence of a nurse on a consultant-led ward round improved patient mortality and safety (Desai et al., 2011). Besides the clinical conversations, the sharing of knowledge provides learning opportunities for the entire ward round team, whether it is the cardiologist learning from the nurse, or the cardiologist teaching the team. The DAG demonstrates that knowledge contributes to effective decisions. Therefore, a positive workplace culture that promotes the dissemination of knowledge and role models ward round behaviour will enhance doctor and nurse education and experience (Dewhurst, 2010).

2.12.3. How will the directed acyclic graph re-engineer the CCU ward round?

As illustrated in the DAG (Figure 2.5), the three causal factors that influence an effective decision are knowledge, the environment and the patient. These factors have a horizontal relationship with effective decisions. In applying the DAG to re-engineer the CCU ward round, it was intended that these causal factors would affect the ward round in the following ways:

1. **Knowledge**: Exposing the ward round to consistent staff (nurses do not rotate through CCU as often as the doctors and cardiologists are permanent members of the cardiology department) and enforcing post-ward round communication may improve patient involvement and highlight relevant clinical information that will lead to action, so that patients receive medical and nursing care sooner.
2. **Environment**: When senior clinicians, such as the cardiologist and senior cardiac nurse, are present on the ward rounds, they not only oversee less experienced staff, but will also teach them about medical and nursing care of the cardiac patient.

   Culture: Ultimately the cultural environment will be exposed to better teamwork, improving collaboration and communication between the doctors and nurses, helping them to make efficient clinical decisions both on and off the ward round.
3. **Patient agency and voice**: Patients' reluctance to speak up about their viewpoint or lack of understanding will be exposed to a nurse who can advocate for them.

As stated earlier, the ward round is complex and thus increases the complexity of our conceptual framework. So, in summary, this thesis uses more than one conceptual framework for understanding human behaviour and performance, so that we can find out how to manipulate the core components that influence an effective decision. That is why we have combined the behaviour change wheel, situational awareness and the DAG for an effective decision into our theoretical framework.

2.13. What is the gap in ward round knowledge?

This structured literature review explored how a new ward round can improve the efficient delivery of patient care. Although nurse presence was mentioned in many articles, a specific focus on the benefits of nurse presence on the ward round was not identified. Neither were quantitative measurement of patient outcomes, such as medication administration delays, fasting times, procedure booking times and other key clinical activities, found in the literature.

The literature has shown the complexities of the ward round. However, if nurses, especially those with specialised training such as cardiac nurses, are to be valued for the care they provide, further research is required to understand the impact that nurses have on the delivery of efficient patient care, especially if nurses are included in the ward round team. Therefore, in the context of the complex cardiology ward round, we also explored how ward round team dynamics influence workplace culture and thus workforce behaviour, and how this affects the timely delivery of patient care. We did not find a formula in the literature for improving the timely delivery of patient care.

2.14. Chapter summary

This structured literature review sought to find not only successful ward round models and strategies that could be adopted by our CCU, but evidence that would contribute to the creation of excellence. Therefore, this chapter has presented quite an extensive search and discussion about the concepts that need to be considered when embarking on such a project.

The literature was explored for ward round models and interventions from around the world and the impact they have on quality patient care. Although many studies successfully reduced length of stay and mortality rates, other patient outcome measures were not so clear. The NHS ward round guidelines have been promoting a variety of recommendations for a decade. Therefore, the elements recommended by those guidelines – consultant-led, nurse presence, patient inclusion, and improved documentation and communication processes – helped drive the design of this intervention. Knowledge gained in this extensive literature search was used to design an intervention suited to the CCU environment in an endeavour to make more efficient decisions and thus deliver better patient care.

Although evidence for a specific formula that creates or builds excellence did not exist, there is encouraging advice from a variety of mostly qualitative studies. The literature returned by the search strategies in relation to leadership, workplace culture, nursing excellence and decision making were helpful, for designing the intervention, as was the theoretical framework for supporting behavioural change. The gap in knowledge arising from a lack of empirical data measuring the impact of a nurse's involvement in the ward round process shaped the primary and secondary outcomes of this project (described in detail in the next chapter). We also still need to understand the relationships and workplace dynamics between doctors and nurses, and thus the behaviours that impact communication and collaboration between the professions.

A suitable conceptual framework provides a philosophical structure for this study. Exploring staff and team behaviour is paramount to successfully implementing new workflows, innovations and interventions. Focusing on workplace culture and how leaders influence group involvement in decision making may improve communication and collaboration amongst doctors and nurses. Lastly, it is important to acknowledge nursing surveillance – that is, the nurse's ability to collate complex patient data in a busy environment, process that data, and communicate and make an effective decision – that will benefit and include the individual patient, to ensure safe and quality

delivery of care. Therefore, a workplace culture that supports communication, collaboration and teamwork between nurses and doctors should exist alongside clinical practice.

It is the work on culture and the application to clinical practice in a sustainable manner that drove the work in this PhD. The ward round study in this thesis was designed to provide insight into and allowed for further development of strategies for maintaining a work group culture that supports quality care delivery, despite the frequent rotation of medical staff through CCU. The EMR system was not fully implemented at the time of this study but was implemented 3 months later. The CCU ward round was revisited after 1 year to see if the ward round study structures, such as situational awareness opportunities, remained in place, as well as to discover doctors' and nurses' perceptions about their decision making and ward round practices. Also, revisiting the primary and secondary endpoints 1 year later was an opportunity to find a marker for a culture that includes nurses and maximises communication and collaboration on the ward round.

The next chapter presents the detailed methods for the re-engineered ward round model, as well as a 1-year follow-up study to assess the sustainability of the new model.

CHAPTER 3. METHODS

3.1. Introduction

In the pursuit of excellence, we wanted to understand how nurses influence the culture and effectiveness of ward round decisions. We also wanted a reliable measure of patient care activities, the subjective experiences of the individual participants and how this all impacts the collective culture. By comparing these variables 1 year later, we will be able to more precisely identify the mechanism that drives a culture of excellence or determine if such a culture is lacking. Quantitative and qualitative techniques were used in a multimethod approach. This included observational research measuring length of stay, all-cause mortality and readmission rates, and surveys and interviews to understand the patient and healthcare worker perspectives (Baiocchi et al., 2014). Randomised controlled trial methods were not possible in this study as it would be unethical for patients to miss out on the ward round and the logistics did not allow for random use of the new ward round model. Also, we did not engage with stakeholders to assist in co-designing this study as it was our intention to implement the intervention with no prior knowledge to keep future control periods uncontaminated (Gordon, 2013; Rogers et al., 2020). Stakeholders were pre-warned at grand round and nursing meetings that the study was commencing on a certain date and instructions will be provided the Friday afternoon before the following Monday new ward round model will start.

Resident and intern rotations in the unit mean there is a major staff turnaround every 12 weeks, so to capture stable team dynamics, the intervention was implemented for one 12-week rotation. We applied a novel technique to switch the intervention “on and off” during intermittent control and intervention periods in three 4-week cycles and measured key clinical activities to deduce effective decision making. We did this to reduce contamination and keep control periods as clean as possible from the new ward round model. We also measured some alternative key clinical patient activities, such as patient education delivery, mobility and fasting status, deemed relevant to efficient and quality CCU cardiac patient care. (see Appendices 10 and 11) (Conroy et al., 2015; Ramkumar et al., 2017; RCP & RCN, 2021a; Zwarenstein & Bryant, 2000).

Patient and staff questionnaires were completed before, during and after the 12-week period, and data was also collected 1 year later to observe any sustainable effects from the intervention. The follow-up study also included staff interviews. Therefore, the whole research project took place in

two periods: the intervention period, where the ward round was re-engineered; and the 1-year follow-up period. A visual representation of the study can be seen in Appendix 12.

Methods will be explained showing the two studies separately:
Study 1: Ward round study –re-engineering the cardiology ward round
Study 2: Ward round follow-up study.

3.2. Purpose of this research

The purpose of this research was to demonstrate that cardiac nurses are an important part of the cardiac stream and are vital to clinical decision making and timely delivery of quality patient care. Structural changes before, during and after the ward round can improve doctor and nurse collaboration so that patients receive the right care at the right time in the right place, and patients understand and feel involved in their care. Ultimately an interventional ward round study can benefit relationships between team members to create a workplace culture that fosters positive outcomes for patient care.

The purpose of reviewing the CCU ward round 1 year after the study was to find out if any of the interventions and teamwork implemented during the initial study remained in place, to better understand the sustainability of the re-engineered ward round.

3.3. Aim

The intent of the re-engineered ward round was to enhance clinical decision making and the communication environment. The changes sought to assist cardiac doctors and nurses in making evidence-based clinical decisions that deliver a patient treatment plan specifically understood and accepted by the patient and all members of the cardiac stream team, so that patient care is delivered sooner.

The ultimate aim was to embed practice and culture change into daily ward round practice that will continue the delivery of efficient quality patient care every day.

3.4. The research question

As discussed in Chapter 1, the PICO model was used to formulate two questions:
Study 1: Does a re-engineered ward round that includes cardiac nurses provide quality patient care sooner?

Study 2: Has the culture and practice change on the ward round, to improve efficiency of care and patient reported outcomes been sustained 1 year later?

The literature search did not reveal any statistically significant mechanisms that build excellence in ward round teams or measurable outcomes that can inform markers for quality of care (RCP & RCN, 2021; Weingart et al., 2021). Therefore, in the pursuit of excellence, which acknowledges a culture that supports a cohesive team of doctors and nurses who listen to the patient and provide prompt quality patient care, Study 1 required a more in-depth question to account for the objectives outlined in Chapter 1. This question was:

> "Will the inclusion of a cardiac nurse with the following ward round innovations affect the workplace culture to improve the timely delivery of care and key clinical activities for CCU patients, especially cardiac medication administration?"

The innovations were:

- Cardiac nurse participation on every cardiac stream ward round
- More collaboration and communication opportunities between cardiac doctors and nurses
- More patient inclusion in decision making about their treatment and understanding of it
- Improved ward round documentation
- Improved cardiologist attendance at the bedside ward round
- Improved overnight treatment plan updates for patients.

The following assumptions about this research need to be addressed in the hypothesis prior to explaining the study designs in this chapter.

3.5. Hypothesis H_1

Excellence in healthcare is achieved when quality evidence-based patient care is delivered promptly. This occurs when doctors and nurses perform as a cohesive team and acknowledge the patient's input when formulating individual effective clinical decisions. Ongoing organisational and leadership support for this culture and ward round practice change will ensure quality, prompt evidence-based care is maintained every day. Therefore, the alternate hypothesis remains: *Structured improvements in ward round planning, attendance and communication between key ward round stakeholders during and after the ward round, especially nurses, will support the clinical decision-making process so that patients receive prompt evidence-based care, leading to reduced delays in medication administration and the delivery of high-quality patient care. This*

high-quality care delivery will remain 1 year later if these improvements and workplace culture changes are embedded into everyday practice.

STUDY 1: WARD ROUND STUDY – RE-ENGINEERING THE CARDIOLOGY WARD ROUND

This study was designed to improve effective decision making amongst cardiac doctors and nurses before, during and after the cardiology ward round so that patients benefit from more timely delivery of care.

3.6. Study design

This study was a non-randomised prospective cohort study using immediate historical controls implemented in three sampling periods to measure quantitative and qualitative data. The quantitative aspect investigated time delays and key clinical activities when delivering patient care, while patient and staff surveys collected qualitative information about the ward round process.

Further observational work was used to determine compliance with the intervention and ward round structures. The staff questionnaires introduced doctors and nurses to ward round concepts without intervention instructions, as an indirect engagement strategy. The patient questionnaires measured general patient satisfaction ratings and their feelings towards understanding and being included in their treatment plans. Quantitative methods measured the time it takes for key patient clinical activities to be achieved, as well as length of stay and readmission rates.

In this study, clinical decision-making abilities of doctors and nurses were monitored as they rotated through each cardiac stream over 12 weeks, as well as the nursing staff's ability to provide medications as prescribed, cardiac rehabilitation and discharge advice materials to the patient, and to deliver timely fundamental nursing care.

This study design was influenced by previously successful interventions documented in the literature such as:

1. Inclusion of nurses on the ward round
2. Patient involvement in decision making
3. Using a ward round proforma and checklist for better preparation and inclusion of relevant information
4. Implementing a communication process to improve nurse and doctor collaboration
5. Addressing education needs and clinical decision-making skills of healthcare professionals.

The design was also influenced by the clinical expertise that the clinical nurse researcher has developed attending CCU ward rounds over the past 30 years. This may be considered an element of bias in the study design.

3.7. Setting

3.7.1. The clinical setting

This research was conducted in a busy 20-bed CCU at a major tertiary metropolitan hospital in Adelaide, South Australia. The CCU admits acute high-risk cardiac patients requiring specialised care from cardiac-trained doctors and nurses. Sometimes this care is urgent and the diagnosis life-threatening. Patients are admitted from metropolitan, regional and rural areas around the state and do not always arrive through the emergency department. There are many referral access points to a CCU bed, including patients requiring elective cardiac procedures, with limited exit points. The most common access to a CCU bed is when a patient is discharged.

3.7.2. The existing workplace culture for decision making

The investigator is a clinical nurse delivering specialised nursing care to cardiac patients at high risk of dying or deteriorating. The CCU doctors and nurses work as teams to manage cardiac patients using best practice guidelines. Although staff are educated and trained to deliver quality care to CCU patients, concern about mortality rates and up to three clinical review meetings have raised concerns about communication between cardiology doctors and nurses in the CCU. There were also concerns about after-hour delays in clinical decisions that may contribute to prolonged delivery of patient treatment and MET (medical emergency team) call activation (Davis et al., 2019).

Other contributors to a decline in patient outcomes may include attrition rates reducing the availability of rostered senior cardiac-trained nurses in the unit, and clinicians batching after-hours decisions, waiting for senior staff to decide on patient therapies on the ward round. Also, the three cardiac stream clinical teams perform three different ward rounds in CCU, making it difficult for the one nurse coordinator to attend all of them. All these factors have culminated in the design of a ward round study that will focus on CCU teamwork and patient involvement to improve the effective clinical decision-making process.

Utilising 30 years of cardiac nursing experience, this project focused on the culture of teamwork between the CCU doctors and nurses and how that influences the delivery of efficient patient care. This included determining how well patients understand their treatment options and their feelings of inclusion in the decision-making processes. This study tested whether a deliberately designed ward round would improve the team culture to help provide more timely delivery of quality patient care, thus enhancing the cardiology department's reputation as a centre of excellence.

Obtaining a reputation as a centre of excellence or achieving Magnet hospital status is how healthcare institutions attract quality staff and the funding to deliver specialised patient care. Delivering quality care using best practice principles is at the forefront of hospital and state health department strategic plans and quality improvement programs (Leggat & Balding, 2018; Moss et al., 2017). If given the opportunity, by having quality processes in place, doctors and nurses at all levels of the clinical hierarchy can lead delivery of excellent patient care. This means staff, including junior doctors rostered after hours, supplying effective clinical decisions 24 hours a day, and nurses supplying 24-hour bedside care.

As described in Chapter 2, a directed acyclic graph, (DAG), or causal diagram was developed to visualise the variables hypothesised as influencing effective clinical decisions and the predicted mechanisms influencing patient care and outcomes in the unit (Cañón-Montañez & Rodríguez-Acelas, 2019). The three major variables determined to have a causal relationship to effective clinical decision-making were patient agency, knowledge and the environment (see Figure 2.5). Cañón-Montañez and Rodríguez-Acelas (2019) encourage nurse researchers to use this tool in their planning phase, as it assists in constructing "plausible causal models that permit the identification of variables required to address the research question and informs the methodological design that must be used to conduct the study" (Cañón-Montañez & Rodríguez-

Acelas, 2019, p. 3). They further emphasised that by adopting new tools such as these, nurse-led research can strive for excellence.

According to the DAG, it is hypothesised that if senior clinicians invest in the CCU ward round team, by promoting a culture of support and trust, this will hopefully translate to more effective clinical decisions. The purpose of the effective decision is to ensure patients receive their care on time or sooner, reducing the number of delays in the delivery of patient care. Ensuring a senior cardiac nurse attends the ward round will mean that the nurse is not only empowered to participate in the ward round decision-making process but can also support the patient and advocate for their needs. Better planning and information gathering, as well as an open dialogue between clinicians and the patient, will improve knowledge and understanding of both parties, which again translates to an effective clinical decision (Boland, 2015; Desai et al., 2011; Hale & McNab, 2015; Kyte et al., 2020).

Study period

The study started on 6 April 2021 for a duration of 12 weeks ending on 25 June 2021, Monday to Friday excluding public holidays.

The 12-week period included three cycles aligned to the 4-week RMO placements in each cardiac stream. The first 2 weeks of the new stream placement was the control period. The second 2-week period implemented the new ward round model or intervention (see Figure 3.1). Doctors and nurses were informed about the new ward round on the Friday before the 2-week intervention period and provided with a staff information sheet, see Appendix 16. Registrars belonged to each stream for longer than the RMOs, whereas cardiologists rotated every week. Nurses were not rostered to a stream but attended the ward round as allocated during the intervention. Sick leave intermittently limited the ability for the exercise stress test (EST) clinic registered nurse (RN) to attend one of the stream ward rounds.

3.7.3. Exposure periods

Exposure periods for the intervention were:

1. 12-week exposure period correlating with commencement of junior medical staff 12-week cardiac placement
2. Monday to Friday, 0800hrs to 1700hrs

3. For patient satisfaction survey: up to 24 hours after first ward round but before the second ward round

   Does not include patients admitted from 1200hrs Friday until 1200hrs Sunday, that is, patients receiving their first ward round on a Saturday or a Sunday morning.

The 12-week exposure period was organised as follows (see Figure 3.1):

Rotation 1:

First 4-week medical rotation in each stream (ACS/ARR/HFS)

Week 1: Control; Week 2: Control; Week 3: New model; Week 4: New model

Rotation 2:

Second 4-week medical rotation in each stream (ACS/ARR/HFS)

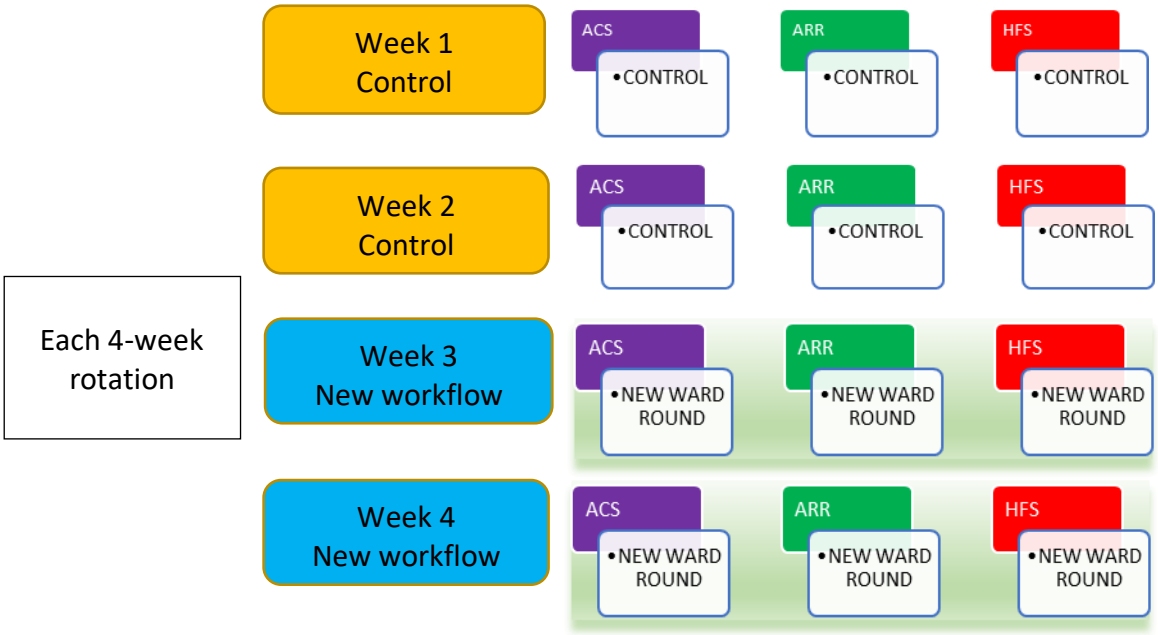
Week 1: Control; Week 2: Control; Week 3: New model; Week 4: New model

Rotation 3:

Third 4-week medical rotation in each stream (ACS/ARR/HFS)

Week 1: Control; Week 2: Control; Week 3: New model; Week 4: New model

Figure 3.1: Control and intervention rotation



ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service

3.8. Participants

Medical staff rotated through the cardiac streams every month, whereas permanent senior cardiac CCU nurses on the early shift, the EST RN and the specialist cardiac nurses were allocated

to each of the three stream ward rounds from 0900 to 1100hrs each weekday. This allowed the EST RN and specialist cardiac nurses to get to their clinics after 1100hrs.

Doctors and nurses working in CCU at the time of the study included:

- Permanent cardiac nurses rostered to CCU including TPPP (transition to professional practice program) RNs
- All patient care nurses, including agency or relieving pool nurses
- Cardiologists, registrars, RMOs and interns rostered to ACS, ARR and HFS streams within the study period.

The patient population included those admitted to CCU under a cardiac stream during the control and intervention periods. Patients must have received their first ward round between Monday and Friday; patients receiving weekend ward rounds were excluded. The three carding streams only do ward rounds from Monday to Friday. Only one medical team covered by a cardiologist, registrar and an RMO does the ward round on Saturday and Sunday morning, with an after-hours RMO covering all other times during the weekend. Therefore, the one nurse coordinator on the early shift finds it easier to attend the one ward round for 20 patients in CCU on a Saturday and Sunday.

CCU admits acute high-risk cardiac patients presenting with a variety of conditions, 24 hours a day, 7 days a week, who require cardiac monitoring. Most patients fall into an ACS diagnostic group requiring coronary interventional procedures. Approximately four to five ST-elevation myocardial infarction (STEMI) and non-ST-elevation myocardial infarction (NSTEMI) patients are admitted daily requiring immediate coronary angiographic procedures. Patients admitted with decompensated heart failure, pre- and post-transplant patients, and those with pulmonary hypertension require positive airway pressure implementation, intravenous (IV) therapy and haemodynamic monitoring. Also, patients admitted with arrhythmias require pacing, ablation, IV and oral drug therapy, and procedures and devices to control the arrhythmia. Pericarditis and myocarditis are other diagnoses for which patients are admitted to CCU for cardiac monitoring.

3.8.1. Number of patient participants

A total of 101 control and 105 intervention patients were given the patient information sheet and opt-out consent (Appendix 17) and completed the survey. They were de-identified and data was collected from their paper records, admissions transfer system (ATS) and EMRs. A hybrid ATS/EMR/paper record existed due to the staged introduction of the new EMR platform called Sunrise.

3.8.2. Number of staff survey participants

Doctors and nurses were asked to complete the surveys, although three of the survey questions were directed at nurses only. Staff surveys were voluntary. The pre-ward round intervention survey was completed by 23 respondents, with 21 respondents completing the post-ward round intervention survey. Respondents were de-identified.

3.9. Exclusion criteria

- Emergency imaging and interventions that occurred out of hours were not to be counted in the data collection.
- Patients admitted after hours who received their first ward round between 0700hrs Saturday and 1600hrs Sunday did not receive a patient survey.
- Patients admitted to CCU but remaining under the care of a non-cardiac, cardiac short stay, surgical or cardiothoracic unit, and those requiring cardiology review were not included in the study, nor their respective medical teams.
- The following patient groups, with severe symptoms, were excluded if a family member or authorised representative was not present at the bedside during the first ward round:
    - Acute delirium
    - Cognitive impairment.

Excluded participants

Patients admitted to CCU remaining under the care of a non-cardiac, cardiac short stay, surgical or cardiothoracic unit, and those medical or surgical patients requiring cardiology review were not included in the study included up to six cardiac short stay patients daily, that is, elective patients admitted Monday to Friday for a variety of cardiac procedures requiring overnight care. On top of this, an extra two transcatheter aortic valve implantation (TAVI) patients were planned for Tuesdays. These patients do not belong to a cardiac stream as the proceduralist is in charge of their care.

Patients admitted from Friday afternoon to Sunday afternoon received a weekend ward round. They were therefore excluded because the exposure period for the study was Monday to Friday and we were capturing only patients' first ward round following their admission to CCU.

Five patients refused to participate in the survey so were not included in any data collection.

These groups of patients were assessed on an individual basis. These groups were not put under any duress if they did not want to participate but were given the opportunity if their family member or significant other was happy to assist with the patient survey.

- Mental health (eg, anxiety, depressive disorders)
- Intellectual disability
- Non-English-speaking background
- Aboriginal or Torres Strait Islander
- Severe cognitive impairment:
    - Measured by a 4AT cognitive and delirium screening score of 4 or more
    - Could not actively participate in the ward round discussion or decisions
    - Patient refusal or displaying disapproval to involve a family member/authorised representative.

3.10. Outcomes

The first four objectives of the study (as described in Chapter 1) sought to measure workplace culture, nurse advocacy and decision making through an environment that supports situational awareness and teamwork, as reflected by cardiac medication delays and timeliness of other key clinical activities. This was the basis for developing the primary and secondary outcomes for the study.

A patient survey was also developed to account for Objective 5, in which patients were asked about their understanding of the treatment plan following their first ward round.

3.10.1. Primary outcome

The primary outcome of Study 1 was delayed medication administration.

Many drug administration areas on the CCU patients' drug charts were recorded as "suspended". This meant the drug could not be administered by a nurse until a medical officer had given permission for the drug to be given or withheld. The admitting doctors wrote up the medication chart, indicating the drug could not be given until approved by senior doctors on the ward round. Nurses may also have withheld doses and clarified with doctors when they were concerned about the benefits for a patient receiving a particular drug. These actions are based on clinical concerns about how the patient will be affected by the drug in the context of their diagnosis, for example, heart rate, blood pressure and kidney function. The frequency of junior doctors suspending

cardiac medications seemed to come from a lack of confidence in making clinical decisions. Cardiac nurses and doctors, therefore, frequently sought assistance to allow them to administer the dose ordered or suspended on the drug chart.

Many of the cardiac medications were ordered to improve prognosis according to best practice clinical guidelines (Chew, Scott, et al., 2016). Unfortunately, staff often batched drug administration decisions until ward round. The bedside ward round was not consistent, and suspended drug dosage decisions were missed or not communicated to the patient care nurse or even the patient. This led to delayed and missed doses of the cardiac medications ordered to improve patient recovery and prognosis. Cardiac-trained nurses were concerned about the detrimental effect this may have on the patient. For example, patients could go through their entire admission without receiving a beta blocker and then go home with a beta blocker ordered on the discharge script.

Trained cardiac nurses understand the prognostic benefits of cardiac drugs. This is best represented by the role of a heart failure nurse in the care of patients at home. It is the heart failure nurse who has the training and can not only attend to patient education and compliance with their care but can also titrate medication regimens in discussion with the cardiologist to optimise prognostic care (Jaarsma, 2005). This institution does not support the role of a heart failure nurse practitioner but does allow the nursing consultants to titrate of heart failure medications within their scope of practice in the outpatient setting only. Senior cardiac nurses are highly trained and, in this particular setting, have a more stable presence within the CCU than the continually rotating cardiology medical streams. Junior medical staff appreciate their knowledge and expertise. Therefore, one of the perceived benefits of the trained cardiac nurse's presence on the ward round is that nurses can influence medication orders as they seek to clarify suspended and withheld orders, missing drug therapy and medication errors on the drug chart.

Aligned with the previously discussed conceptual framework, the senior cardiac nurse is able to ensure the patient's needs and quality goals of care are met. The cardiac nurse is empowered to participate in the treatment plan discussion and share their knowledge of cardiac nursing and patient needs. The nurse becomes a valuable member of the team and has the opportunity to contribute to effective decisions. In this case, the decision is what and when to give or not give cardiac medications.

Delayed cardiac medications were measured in hours and minutes from the due dosage time to the actual administration time on the medication chart, adjusted for the total number of cardiac drugs prescribed for each patient. Each patient's cardiac drug administration delays were measured daily and accumulated over the duration of the patient's stay in CCU:

$$\frac{\text{Delays}}{\text{Drug count x LOS}}$$

where

Numerator = total number of delays (mins) in cardiac drug administration for each patient

Denominator = total number of cardiac drugs prescribed for each patient multiplied by the length of stay (LOS) in CCU (days). This research is unique in its ability to capture of this data as the literature has not identified any other studies measuring this delay.

The delays in cardiac medication delays were calculated according to the following criteria:

1. **Included** all cardiac drugs: antiplatelets, P2Y12 and aspirin; beta blockers; ACE inhibitors/ARBs; calcium antagonists; anti-arrhythmics; prazosin; digoxin; statins and antihyperlipidaemics; anti-anginals including perhexiline, nicorandil and nitrates; antihypertensives; diuretics, electrolyte replacement or other adjunctive agents given for treatment of cardiac conditions (e.g. sildenafil, sitagliptin, colchicine).
2. Held or ceased medications are considered a definitive decision and are **excluded**.
3. Reasons for medication suspension and delays
   - 3.1 Doctors
     - 3.1.1 Junior doctors suspend medications until reviewed by senior medical staff on the ward round. They place an "rv" symbol above the dosage time to prevent the drug being given until medical review.
     - 3.1.2 Drugs may be suspended or delayed due to clinical concerns that rely on morning blood results and/or patient signs and symptoms to resume, change the dose, hold or cease the drug.
     - 3.1.3 The "rv" symbol on the drug chart is intended to indicate that a nurse will not administer the drug until clarification/permission is obtained from a doctor.
   - 3.2 Nurses
     - 3.2.1 Nurses will withhold the drug at the due dosage time if concerned about route, dosage, legibility, or patient signs and symptoms until clarification is obtained from the doctor, according to the National Inpatient Medication Chart (NIMC) safety guidelines (ACSQHC, 2019).

3.2.2 Nurses will write a “W” symbol in the administration space for “reasons for not administering” the drug, per the NIMC guideline codes (ACSQHC, 2019, p. 29). Another practice is to leave the administration square blank until the nurse clarifies the order with the doctor.

3.2.3 An informal routine has crept into current practice. Some nurses may also use the “rv” symbol instead of “W” due to the common use of this method by medical staff. This still delayed drug administration until medical approval.

3.10.2. Secondary outcomes

Secondary outcomes of Study 1 were:

1. Time, measured in minutes, to key clinical activity
   1.1. Admission time to booking time for imaging
      1.1.1. Admission time on ATS/EMR to booked time on South Australian Medical Imaging (SAMI) and echocardiogram (echo) applications (Prosolv)
   1.2. Admission time to booking time for interventions
      1.2.1. Admission time on ATS/EMR to booked time on health track, echo and/or SAMI applications
      1.2.2. Booked times were measured during business hours (0800–1630hrs)
      1.2.3. Admission time on ATS/EMR to booked time with exercise stress test nurse
2. Measure of patient understanding
   2.1. Satisfaction survey
   2.2. Counting patients that received
      2.2.1. Driving restriction advice for relevant patient groups
      2.2.2. Cardiac rehabilitation material for relevant patient groups
      2.2.3. Discharge advice
      2.2.4. Patient satisfaction survey
3. Duration of key clinical activity

3.1. Cumulative length of time in minutes for fasting
    3.1.1. Includes full fast, fast after a light breakfast (FALB) and clear fluids
    3.1.2. Planned start time taken from midnight unless FALB, taken from 0800hrs
    3.1.3. Unplanned fasting time taken from ward round time, documented decision time in notes, ATS, or EMR order entry time, whichever is sooner
3.2. Length of time indwelling urinary catheter (IDC) in situ, insertion time to removal time, measured in minutes

4. Episodes of nursing care that limits patient mobility and impacts expected date of discharge
    4.1. Patients on bed rest for more than 24 hours
        4.1.1. Ask patient if they have been able to mobilise and sit out of bed
    4.2. Patients receiving oxygen therapy during their admission.
5. Length of stay
6. Readmission rate at 30 days

3.11. Exposure

3.11.1. An environment for decision making

As discussed in the previous chapters, CCU is has a problem providing enough senior cardiac trained nurses to attend all three ward round. See Appendix 21-24 where CCU staffing levels attempt to match the unit's activity in a situation where cardiac trained nurses are leaving the profession. Only one cardiac trained nurse is rostered to coordinate the shift and attend the three morning ward rounds. Therefore specialist nurses for ; Heart Failure, Transplant and Pulmonary Hypertension as well as the Exercise Stress Test nurse were recruited from their clinics between the hours of 9am to 11am to fill the gap and attend the HFS and ACS ward rounds. This allowed the nursing coordinator to attend the ARR ward round, covering all three ward rounds from Monday to Friday. We wanted to measure the impact of a senior cardiac nurse's influence on effective decision making when they attend each of the three ward rounds.

Experienced, senior cardiac nurses often struggle to convince junior doctors to make the clinical decisions that cardiac nurses believe are vital to cardiac patient recovery. Often, this occurs after hours when senior medical staff are not in the building. This is a workplace culture that reflects a lack of empowerment, reluctance to seek senior medical advice after hours, lack of confidence in nurses' own abilities, and mistrust between junior doctors and senior cardiac nurses (Kurhila et al., 2020; Lees, 2013). Although changing this culture is a challenge, this thesis study focused on

improving trust between doctors and nurses so that more effective clinical decisions could improve the timely administration of cardiac drugs and reduce the number of missed doses.

As mentioned in the previous chapter, and indicated in the DAG (Figure 2.5), culture is one of the environmental factors that influence effective clinical decisions. Before the ward round intervention was implemented senior cardiac clinicians were counselled about improving trust among their clinical team. This strategy was centred on "investing in the team" and engaging in the project plan to allow the RMO time to prepare for ward round and then present the treatment plan to the ward round team. The new ward round structure allowed doctors time to discuss the patient with the cardiac and patient care nurses, collect relevant information according to a checklist/proforma tool, and then present their clinical decisions in an accepting, learning environment with patient involvement (Collin et al., 2015; Garg, 2011; Lakshminarayana et al., 2015).

3.11.2. The ward round proforma

In practice, a formal ward round training environment does not exist in the CCU. Doctors learn by observing ward round practice in a variety of clinical settings (Nikendei et al., 2007). Structural changes to the CCU ward round included a preparation period before the start of the round, a checklist and proforma during the round, and communication opportunities following the ward round and at the end of the day. See Appendix 13

The CCU ward round proforma was designed to help prepare and document relevant information during and after the round. It was to be used as a reference tool when doctors and nurses regrouped in short huddles throughout the day to update treatment plans. This culminated in a shorter paper round with the cardiologist and registrar at the end of the day, away from the bedside, to ensure patient care was on track and overnight treatment plans for unexpected deterioration were in place. Because after-hours doctors and nurses were more informed, they could feel comfortable contacting on-call senior medical staff if they wanted help with clinical decisions. Treatment could then continue throughout the 24-hour period without care delays, as after-hours staff did not have to wait or delay decisions about patient care until the morning ward round.

The proforma also had workflow instructions on the back of the document for doctors and nurses to follow. This document was placed in the patient folder for every ACS, ARR and HFS patient admitted from Monday morning until Friday morning. An application to the medical records department ensured that the proforma became a trial document that was permanently included in patient notes.

3.11.3. Communication and collaboration inside and outside of the ward round

Before the ward round restructure, the medical team had only a short period of time to collect relevant information and prepare for the ward round that started immediately following the night duty RMO hand over at 0800hrs. Then during the ward round bedside visit, which takes on average 8–10 minutes (Creamer et al., 2010; Fernandes & Eneje, 2017), decisions were made that influenced not only patient care but also discharge planning, cardiac rehabilitation and future out-of-hospital needs. In this context, it is therefore understandable that some patient care decisions were delayed (Morgan, 2017). A follow-up process was required to support ongoing ward round decisions throughout the day, rather than relying only on one 10-minute meeting with the patient. Consequently, the ward round intervention formalised inter-professional meetings or team huddles throughout the day, culminating in a second non-bedside round at the end of the day (Edbrooke-Childs et al., 2018; Othman et al., 2018).

3.11.4. The staff survey

The primary investigator used Qualtrics survey software to create questions for the staff survey (see Appendix 14). Some questions included responses on a Likert scale, which captured opinions to provide “detractor”, “passive” and “promoter” measurements so that a net promotor score could be calculated to indicate a summarised opinion of the group of respondents (Krol et al., 2015). The staff questionnaire was administered online, 2 weeks before the ward round study commenced and 2 weeks after completion of the 12-week study. Emails with a Qualtrics link to the survey were sent to staff, and a desktop icon was provided for staff to access the site during working hours. Participants were de-identified.

Staff were surveyed as an engagement strategy, to get them thinking about decision making, information gathering and making treatment plans for their patients. One question also sought their viewpoint on having a cardiologist review patients twice a day.

3.11.5. Intervention: new ward round workflow

0800hrs:

- Pre-ward round preparation
- Overnight handover and information gathering for ward round prep – proforma/checklist completed
- Discussion between patient care nurse and RMO to decide on morning medications and make a pre-ward round treatment plan to present to the ward round
- Treatment plan documented on proforma

Ward round

0900hrs:

- Bedside ward round started for each stream, attended by:
  - Cardiologist
  - Senior cardiac-trained nurse (stream nurse)
  - Registrar
  - RMO and intern, except for ARR team (RMO only)
- Pre-ward round treatment plan discussed among ward round team away from the bedside; then decisions made about the treatment plan in consultation with the patient at the bedside.
- Medication charts updated, any suspended medications clarified and documented
- Treatment plan documented on proforma
- Stream nurse informs patient care nurse of decisions and adjustments made to the treatment plan by the ward round

Post-ward round huddles

1100hrs:

- Post-ward round huddle to clarify decisions and expected delays
- Attended by stream cardiac nurse and stream RMO
- Cardiac nurse shift coordinator updated by cardiac stream nurse
- Patient care nurses kept informed by shift coordinator for the rest of the day

1430hrs:

- Huddle to update treatment plan progress and clarify delayed clinical decisions
- Attended by cardiac nurse shift coordinator and stream RMO

- Patient care nurses kept informed by cardiac nurse shift coordinator

1630hrs:

- Cardiologist and registrar return to CCU to:
  - Discuss treatment plan progress with late shift nurse coordinator and stream doctors
  - Review patients at the bedside if required
  - Confirm an overnight plan
- Patient care nurses updated by cardiac nurse shift coordinator

Note: Patients receive an update of their treatment plan from stream doctors and patient care nurses throughout the day, as well as possible clarification from the cardiologist and/or registrar if they see the patient again at the end of the day.

3.11.6. Control: current ward round workflow

0800hrs:

- Registrars and consultants receive handover from the night RMO

0830hrs:

- Cardiac streams often leave the unit to review emergency department patients waiting for admission
- If no emergency department patients, one or two streams start the ward round
- Nursing staff attempt to write in completed blood results
- Daily ECGs checked and placed in patient notes
- Interns print imaging results
- Not all 0600hrs blood results are available for ward rounds at this time

0900–1200hrs:

- Each of the three streams attend the unit for ward rounds, at unpredictable times
- Only one cardiac nurse shift coordinator is available for all three streams; therefore, communication to bedside nurses of current treatment plans and clinical decisions is intermittent, including which suspended and new medications can be given
- Partial intermittent ward rounds occur as cardiac streams come and go from CCU
- Cardiologist only sees new patients and may not join for the entire ward round
- The team leaves the ward, returning later
- Difficult to keep track of which patients have been seen by the ward round

- Nursing staff will also source ward round treatment plans by:
  - Asking the patient
  - Reading patient notes
  - Discussing with medical staff who are back in the unit, or calling them frequently for clarification
- Delays and confusion about information occur when the intern or RMO need to clarify with registrar or the cardiologist

1200–1700hrs

- Non-formal process of nurses chasing medical staff about decisions and treatment plan changes and progression
- Non-formal process of doctors informing the cardiac nurse shift coordinator or patient care nurse about delayed decisions and updated treatment plans
- Change of nursing shift at 1530hrs; nurses hand over treatment plans and awaiting decisions to each other
- Late nursing staff chase medical staff and vice versa to update treatment plans and delayed clinical decisions

Note: Patients receive mixed messages about their treatment plan throughout the day.

3.12. Data collection

3.12.1. Source data

At commencement of the ward round study, the first EMR implementation stage was in place. This meant administrative data (demographic, admission and discharge data, including length of stay) and fasting orders (fasting status) could be collected electronically. All other data was collected from paper medical records, that is, the time taken for key clinical activities such as medication administration and booking imaging and intervention procedures, and total IDC insertion time.

3.12.2. Observational data collection

Other data collected was staff compliance with the new workflow that included;

1. Cardiologist present on the ward round
2. Cardiac-trained nurse present on the ward round
3. Ward round conducted before 11am
4. Post-ward round huddle with RMO

5. Evening ward round huddle/follow-up with senior medical officer (registrar or cardiologist)
6. Use of the proforma.
    - Ward round proforma completion to determine participation of stakeholders in the clinical decision-making process
    - Documentation of pre-ward round decisions of doctors and nurses
    - Preparation of ward round information
    - Documentation of post-ward round treatment plan

Compliance was counted according to each patient's length of stay, considering the number of individual intervention ward rounds they received. This provided a percentage of compliance that was compared within each stream.

Patient survey: an insight into patients' satisfaction with their understanding of their treatment plan, see Appendix 15

1. Demographics: Gender and age
2. Which cardiac stream saw them on the ward round
3. Understanding of their treatment plan
4. Inclusion in the decisions made about their treatment plan
5. Length of hospital stay
6. Knowledge about fasting status
7. Knowledge about pending procedure, scan or imaging test
8. Knowledge of commencing new medications
9. A satisfaction rating for their overall care in CCU

Nurse-led patient care clinical decisions; quantity of

1. Documentation of cardiac rehabilitation and discharge advice given to patients
2. Patients that remain on bed rest more than 24 hours after admission
3. Patients that have oxygen therapy in situ during ward round

3.13. Bias

As a historical controlled trial, elements of bias may have existed in the design of this study (Wu & Xiong, 2016). Two possible sources of bias were:

1. Selection bias due to this being a single-centre investigation located in the one clinical area – However, individual selection bias was mitigated by inviting all patients receiving a ward round

on the day of or the day following admission to participate, as long as they met the inclusion criteria. Participation was voluntary.

2. The investigator was also participating in the intervention – As a senior nurse, as well as a researcher, she took part in the ward round due to rostered responsibilities. This could not be avoided, but it is important to note a potential influence on the success of the intervention.

3.14. Study size estimation

Power calculations were made with a pre-intervention pilot sample size of 65 individual medication orders. Medication delays were measured in minutes, accumulated for the duration of the patient's hospital stay. Delays were determined by retrospective analysis of medication charts and documented time of the ward round in the progress notes. This defined when decisions were made to give, hold or discontinue suspended medications. Those that were originally on "hold" were not counted as this is considered a definitive clinical decision. For suspended medications with the initials "rv" above the administration time, it was not always clear whether the "rv" was initiated by the nurse (while waiting for clarification of the drug order from medical staff) or the doctor. However, for the purposes of the sample calculation, the time taken for clarification of whether to give the drug was measured. The sample yielded an average time of delay of 289 minutes (SD +/−350 min) per patient. Therefore, assuming a 50% reduction in the delay associated with implementation of the new ward round structure, sample size for the study was calculated as 90 patients (i.e. 30 patients for each stream) per arm (total n=90) to maintain a power of 0.8 and a type 1 error rate of 0.05.

3.15. Statistical analysis

Continuous variables were reported as medians (with interquartile ranges [IQRs]) and compared by Mann–Whitney U testing, while categorical variables were reported as counts and percentages and compared with Chi-square tests. The primary analysis of delay in medication decision making included the modified intention to treat population (i.e. all patients admitted between 1600hrs on Sunday and 1000hrs on Friday), again using the Mann–Whitney U test. All analyses were undertaken using STATA 16 (College Station, TX); a p value of 0.05 was considered statistically significant. As the data was not evenly distributed, a non-parametric test, the Kruskal–Wallis test, was used to measure variables for impacts of the ward round intervention on cardiac medication delays.

3.16. Data security and handling

The study site agreed to allow the study team and appropriately certified and credentialed auditor designees to have direct access to department records for review and verification if required. The study team performed ongoing monitoring, including source data verification, to confirm that data collected for the study by authorised site personnel were accurate, complete and verifiable from source documents wherever possible; that the safety and rights of participants were being protected; and that the study was conducted in accordance with the currently approved protocol and any other study agreements, International Conference on Harmonisation guidelines for good clinical practice (ICH GCP), and all applicable regulatory requirements. The confidentiality of the data verified and the protection of the participants was respected during these inspections. It is understood that the study team personnel are bound by professional confidentiality and, as such, will not disclose any personal identity or personal medical information.

Appropriate measures were taken to ensure the security of personal data (including restricted access to computer databases). Research-specific records and documents pertaining to the conduct of this study must be retained by the investigator for 15 years after study completion, unless local regulations or institutional policies require a longer retention period. No records may be destroyed during the retention period without the written approval of the primary investigator. No records may be transferred to another location or party without written notification to the primary investigator.

3.17. Ethical considerations

The Human Research Ethics Application (HREA) and Site-Specific Application (SSA) were made electronically through the new SA Health Research GEMS website (SA Health, 2021) to the Southern Adelaide Local Health Network,(SALHN Office for Research. This study was one of the first applications put into the new system in January 2021, although originally submitted in the middle of December 2020. Up to three ethics review requests were required to ensure the surveys adequately protected patient and staff confidentiality and ensured an adequate staff engagement strategy. One face-to-face ethics committee meeting via Zoom clarified the reason for using a research methodology as opposed to a quality improvement strategy. The committee was told the intention of the study was to gain sustainable impact to ward round practice that can translate to other wards and even hospitals. Ethics approval was obtained on 19 March 2021 and governance approval on 29 March 2021. See Appendix 18 for the ethics approval letter and Appendix 19 for

governance approval. Overall, the entire ethics and governance submission took 4 months. The study started on 6 April 2021 and finished on 25 June 2021.

STUDY 2: WARD ROUND FOLLOW-UP STUDY

This research wanted to measure the sustainability of the initial ward round project and the changes to practice and culture. In line with the final objective, we wanted to evaluate the ward round structures and timely delivery of patient care by measuring primary and secondary endpoints 1 year after the initial ward round study, as well as conducting staff interviews.

This follow-up study was delayed due to circumstances beyond the control of the primary investigator. An amendment was made to the original ethics application for the follow-up study, so that measurements could be taken 1 year after Study 1 to determine the sustainability of the original ward round study.

The amendment request was made to the SALHN Office for Research in November 2022. A resubmission was required in December 2022, which was then approved on 9 January 2023 (see approval email in Appendix 20). Data collection from EMRs commenced by the end of January, with interviews starting in February 2023. All data was collected by 15 May 2023.

3.18. Hypothesis H_0

The null hypothesis states:
Without leadership and inclusion of a cardiac nurse on all three ward rounds, it is unlikely that benefits to the timely delivery of patient care and cohesive teamwork between doctors and nurses will persist a year after the initial intervention.

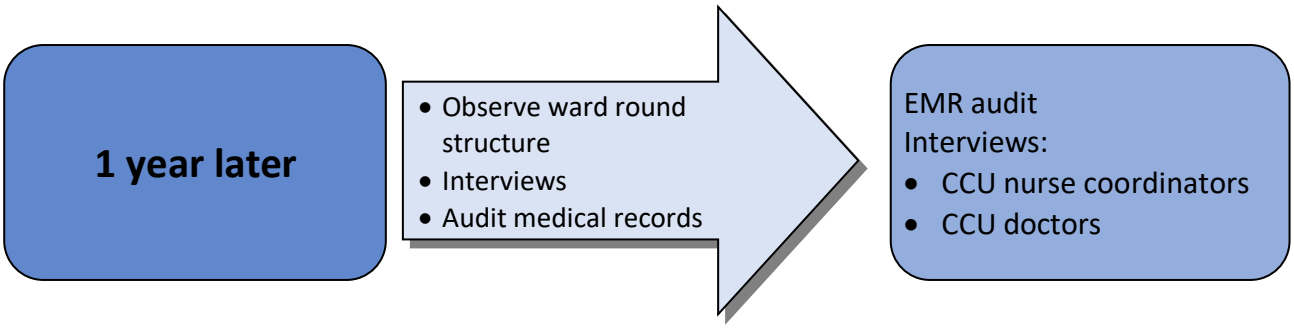
3.19. Study design

Study 2 was a non-randomised, prospective, multimethod design, comparing Study 1 results after the intervention with executed staff interview responses, ward round observations and data collection repeated 1 year after Study 1, for a period of 2 to 12 weeks. This ascertained sustainability of the restructured ward round implemented in Study 1 and therefore measured whether daily effective decision making and prompt patient care delivery was still occurring.

An audit of key clinical activities was obtained from EMRs. Follow-up feedback was also sought from doctors and nurses regarding the status of the ward round in the following year. This was

completed by observing the ward round and interviewing the CCU doctors and nurses, with written consent, to capture attitudes and any sustained elements of the intervention. See Figure 3.2.

Figure 3.2: Schematic view of follow-up study



CCU = cardiac care unit; EMR = electronic medical record

Using a multimethod approach, interview data was analysed both qualitatively and quantitatively. A positivist approach assumes that there is only one reality that can be described and explained, and also attempts to find a causal relationship within the data, (Alharahsheh & Pius, 2020). This way of thinking falls into quantitative research methods, which were used to analyse the timely delivery of patient care in the first ward round study and in the comparison in this second study. We used Likert scales on some of the questions in staff interviews to assist with our analysis. Likert scales are a useful tool for measuring attitudes and opinions and can be translated into a numbered format for statistical analysis (Batterton & Hale, 2017). This first part of the interview analysis therefore takes a quantitative and pragmatic approach to the interview content.

To interpret participants' responses with a more open mind, one needs to understand more about the context of what is being said and why the person is responding this way. As well as the unspoken word, expressions and body language of the participant are also important (Alharahsheh & Pius, 2020). To access this qualitative data, we added an interpretative approach and used thematic analysis to better understand this rich source of information. Clarke and Braun (2017) are well known for their work on thematic analysis and have provided much education about the benefits of using this method (Clarke & Braun, 2017). NVivo 1.7, QSR International, software was used to code the non-Likert participant responses into categories so that we could explore recurring themes. Therefore, using inductive thematic analysis helped us capture the essence of doctor and nurse behaviour toward each other, and how nursing surveillance characteristics

actually make a difference to team dynamics and thus patient inclusion and clinical decision making.

3.20. The setting 1 year later

3.20.1. The electronic medical record (EMR)

The EMR system was fully implemented by the beginning of 2022. This meant that all documentation, orders, results and patient care activities were recorded electronically. Some paper records such as ECGs, consents, and angiogram and echo results were still kept in a patient record folder. This made data collection for Study 2 different to the previous study, which had required searching through paper medical records.

After the implementation of EMR system, called Sunrise, instead of writing in paper records during the ward round, the cardiac streams take a mobile computer called a “workstation on wheels” (WOW) on the ward round. It is common for two doctors to each have a WOW, one for documenting and one to search through patient results etc. With the implantation of Sunrise, a change in workflows determined different methods of charting medications and ordering tests.

3.20.2. Electronic medication orders, eMar

The electronic form of the medication chart is now called the electronic medication administration record, or eMar. When eMars replaced paper medication charts, doctors and nurses no longer had the option to document their query of “rv” or “W” on a patient’s eMar as they had with the paper chart. The only option for a nurse to indicate the dose had not been given was to leave the scheduled dose blank, in which case the scheduled timeframe would change from yellow to red after 90 minutes (a visual reminder); write a comment within the scheduled dose parameter; and/or mark as not done. This needed to be followed by documenting the reason in the nursing note and informing the doctor, as per the usual practice with the NIMC safety guidelines (ACSQHC, 2019).

The option for a doctor who wants the medication order to be visible on the eMar while withholding a dose is to “suspend” that medication order. The nurse will see a symbol, a hand signalling stop, on all scheduled dose times, indicating the doses are not to be given. However, the suspend button has soft stop functionality. This means that, if a nurse tries to “mark as done” (i.e. administer the medication), the message that pops up to remind them that the dose is suspended has an option to override this function if the dose is required before the suspension is cancelled by

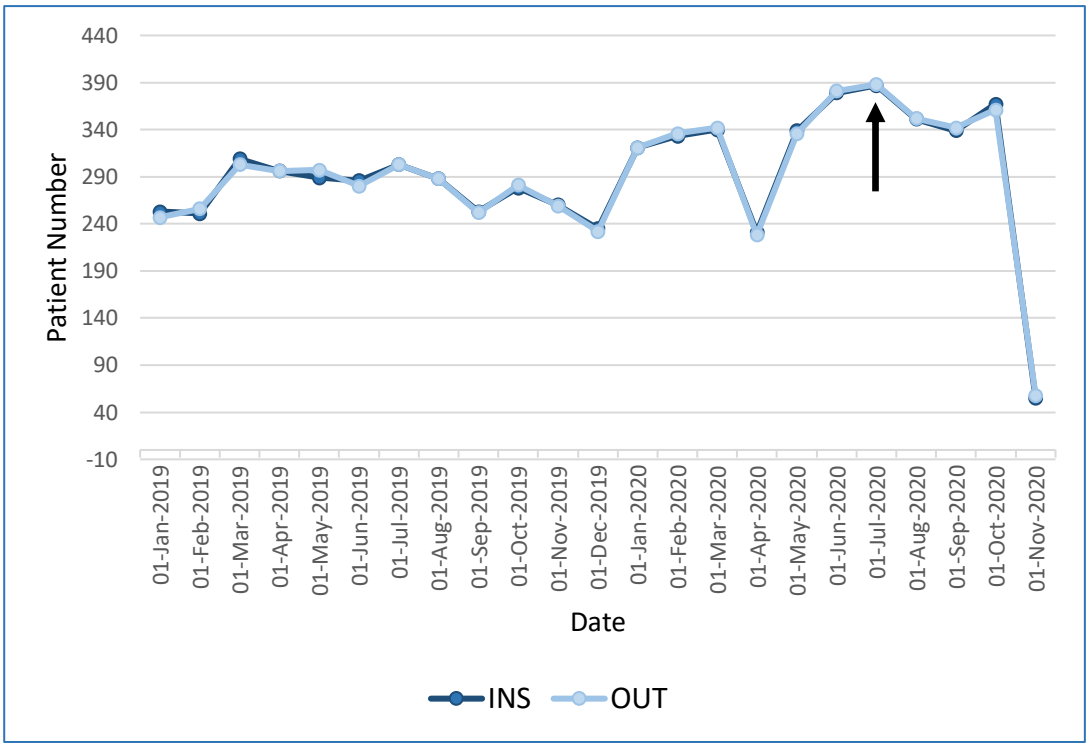
the doctor. However, if the nurse believes the patient requires that suspended dose, they must speak to the doctor as they did when “rv” was used in the old paper system. Electronic doctor and nursing documents, as well as possible comments written in the eMar, also reveal more information. With the introduction of eMars, it became even more imperative for doctors and nurses to speak with each other about doses rather than merely documenting and reading the eMar.

Writing a dose on hold was a different mechanism on the eMar: holding a drug was only viewed in the orders tab, and did not appear on the eMar. The hold functionality was not often used by cardiac doctors as the functionality is for the entire drug, not dose by dose. For example, a medication infusion for chest pain, GTN, could be placed on hold on the patient’s admission and released at a later time by doctors or nurses according to the patient’s condition.

3.20.3. The cardiac care unit 2020–2023

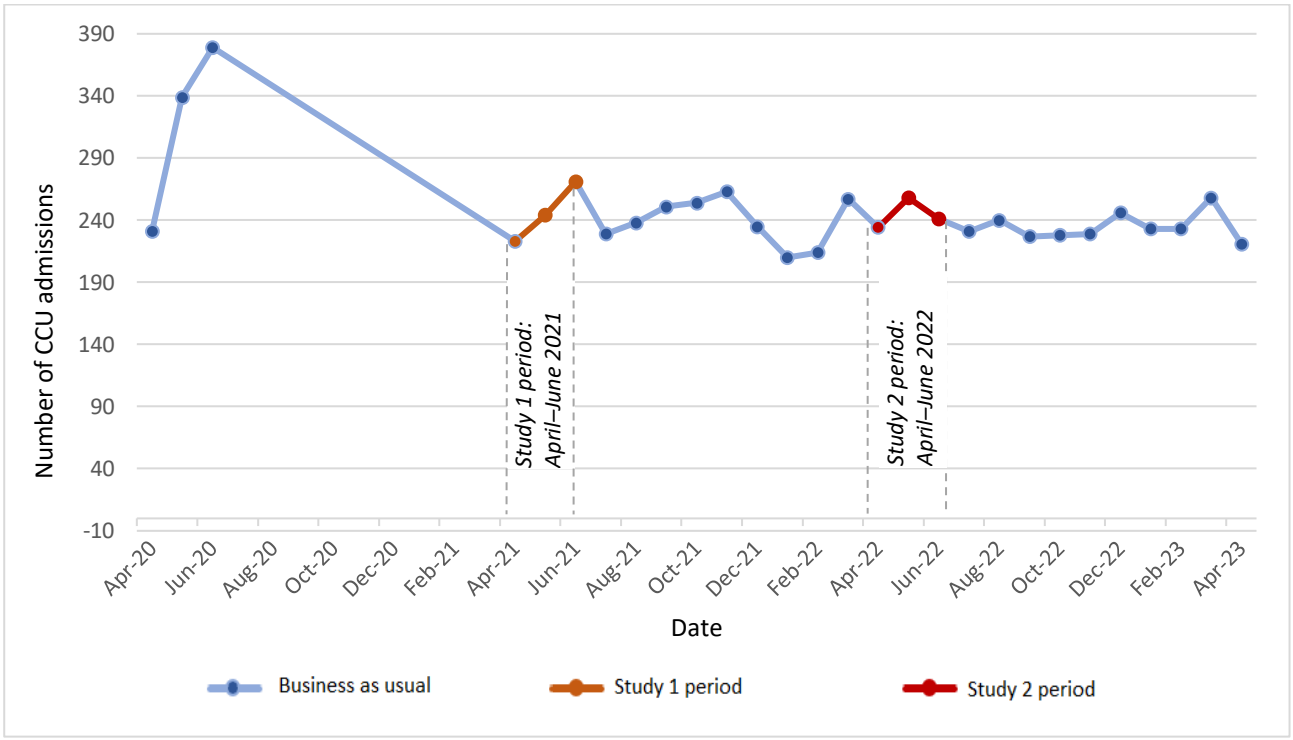
COVID-19 was progressing through its third and fourth year by the time the follow-up study data was collected. This meant that COVID infection rates hit highs and lows between 2020 and 2023, with COVID variant waves impacting hospital and CCU activity and staffing resources. Demands on CCU beds remained high, with many nurses continuing to work double shifts and beyond their full-time equivalent hours to facilitate safe staffing levels. However, the peak of patient movements in and out of CCU reached close to 400 by August 2020. See Figure 3.3. As vaccination rates increased and there were fewer COVID-related admissions, hospital admission rates began to reduce. CCU admission rates had reduced to 220–270 per month during the intervention and follow-up study periods. See Figure 3.4.

Figure 3.3: Monthly CCU patient movements (admission, discharges) 2019–2020



Arrow indicates: peak CCU admissions and discharges
Source: Admissions transfer system

Figure 3.4: CCU patient admissions, 2020–2023



Source: Electronic medical records

In 2022–2023, cardiac streaming ward rounds continued without a dedicated cardiac nurse attached to each team leaving the cardiac nurse coordinator struggling to attend all three ward rounds. This was despite the ward round study's positive benefits being disseminated locally, statewide and nationally. Senior and leadership stakeholder engagement was limited, and ward round practice change had not occurred at this time.

3.20.4. Staffing and patient activity 2021–2023

Comparative data in Figure 3.4 shows that over 200 patients were admitted to CCU during 2021–2023. This remains a high level of activity. Nursing skill mix remained stretched due to furloughing for COVID reasons; however, new cardiac nurses had been employed. Three nurses completed their graduate diplomas and more nurses became ALS (advanced life support) accredited. This meant more nurses were able to learn the coordinator role and the clinical support role for early and late shifts. Night duty staffing was still set at four, requiring escalation if acuity predicted five nurses being required for the night duty. It became commonplace that corporate nursing could not replace sick leave or escalation of staffing levels. CCU nurses were often required to do double shifts to accommodate shortfalls, which snowballed to shortages for the next shift when they were unable to get back to work within the appropriate timeframe. Again, relieving agency non-cardiac-trained nurses, if available, became commonplace. CCU nurses were arriving for their shift expecting to stay for the next one. See Appendix 24 for the 2021–2023 staffing models. Less experienced, newly trained cardiac nurses were now starting to coordinate the early shift in 2023. This influenced recruitment for the nursing staff interviews as more junior cardiac nurses started to attend and learn to interact on the ward round.

3.20.5. Study period

Data for the primary and secondary endpoints was collected at 1 year following the start of the 2021 study. Data was taken from EMRs of patients admitted to CCU under the ACS, ARR and HFS streams between 4 April 2022 and 6 June 2022. Data collection took 2 months.

Due to delays in the ethics application, the staff interviews took place from 20 February until 3 March 2023.

3.21. Participants

3.21.1. Patient population

As in Study 1, the patient population included those admitted to CCU under a cardiac stream who received their first ward round between Monday and Friday. Patients receiving their first ward round on the weekend were excluded.

As with the initial study, patients admitted to CCU remaining under the care of a non-cardiac, cardiac short stay, surgical or cardiothoracic unit, and those requiring cardiology review, were not included in the study, nor their respective medical teams.

3.21.2. Interviews

As with previous engagement strategies with this study, a formal presentation at the Cardiology Grand Round requested doctors and nurses who attended the weekday ward rounds to volunteer for the staff interviews. This included cardiologists, registrars, RMOs, interns and cardiac nurse coordinators. An audio recording was taken for each interview. The nurse researcher, also a colleague, conducted the interviews while being an established member of the patient care team. This integration likely facilitated open communication and a comfortable environment for the participants knowing that their interactions were with a familiar and trusted colleague. As with Baathe's (page180, 2016) work, it needs to be acknowledged that the information obtained by this method can be influenced by the "researcher's own pre-understanding". This comment is made in reference to the interpretation of the answers and not necessarily in relation to the influence over the participants free will to attend the interviews. All participants seemed comfortable voluntarily attending the interview with the nurse researcher asking the questions knowing that their identity will be de-identified in the results.

Interviews were aligned with RMO placements in CCU, taking place within the second 4-week rotation of CCU placements in 2023. Earlier 2022 intern and RMO rotations were missed due to a delayed ethics application. Therefore, interviews captured a 2-week ward round period from 20 February until 3 March 2023.

Nurses who coordinated early weekday shifts during that 2-week time frame were asked during work hours if they would like to participate in the interviews. This time we included newly trained cardiac nurses who were just beginning to develop their team leading skills, and were able to compare their responses with those of more senior and experienced cardiac nurses. Participation

in staff interviews was voluntary, with information sheets supplied and written consent obtained. See Appendix 26.

Responses to each question were coded using NVivo software to create 15 major codes, discussed in the results section of this thesis.

3.22. Exposure

Patients' EMR's were accessed 1 year following the first study, between 4 April and 6 June 2022, to measure primary and secondary endpoints, according to ethics approval. The patient population in Study 2 consisted of 114 patients with 115 episodes of care: 40 patients admitted to the ACS stream, 36 to the ARR stream and 38 to the HF stream. This compared to 105 patients for the intervention group admitted at a similar time in 2021.

Nurses who coordinated an early shift and cardiac stream doctors who participated in the ward round between 13 February and 3 March 2023 were interviewed. Participation was voluntary, with written consent, and participants were de-identified. Interviews took place in a quiet office with the comfort of a cup of tea and a break from the outside ward hustle and bustle. Length of interviews ranged from 18 to 25 minutes, depending on how long the participant wanted to speak. Six nurses and seven doctors volunteered. A total of 13 staff out of a possible 25 to 30 who were actively attending the ward round within that month, volunteered to participated in the interviews: seven doctors and six nurses. This included cardiologists, registrars, RMOs and interns, as well as cardiac nurses with a variety of experience coordinating the morning shift. See Table 3.2 for a breakdown of the participants.

Table 3-1: Interview participants by seniority and cardiology experience

Doctor & Nurse no.	Qualification	Stream
2	Cardiologist	HFS, ARR
2	Registrar	ACS, HFS
1	RMO	HFS
2	Intern	ACS, ARR
1	Associate nurse unit manager	
1	Clinical nurse	
1	Experienced registered nurse >5 years cardiac nursing	
3	Registered nurses <2 years cardiac-trained	

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service
A total of 13 doctors and nurses participated in the interviews. Broken down into seniority and experience in cardiology.

3.23. Exclusion criteria

Doctors' and nurses' experiences with weekend ward rounds were excluded as weekend rounds use a different model to the weekday system. Only responses pertaining to weekday ward rounds were considered for the thematic analysis.

Patients were not interviewed in this study. Data was only collected for those cardiac stream patients belonging to the ACS, ARR and HFS streams receiving a weekday ward round. All short stay admissions and non-cardiac stream patients admitted to CCU during the exposure period were not included in the data collection.

3.24. Outcomes

3.24.1. Primary outcome

Cardiac medication delays were again used as the primary endpoint for Study 2. Due to the introduction of the EMR system, information on delays in cardiac medication administration was collected differently than in Study 1. As mentioned in section 3.20.2, suspending medication orders by doctors is the only way to visualise on the eMar that the nurse is not to give the medication. Nurses need to verbally inform doctors when they query a medication dose even

though they have electronic functionality to write comments and let scheduled doses remain blank or marked as not done.

Practically, however, it was observed that nurses are no longer challenging suspended medication doses when they may believe the patient does need the dose. Doctors were previously writing 'rv' on the paper charts indicating that the decision to give these drugs had been suspended, prompting the nurse to investigate further. The new EMR workflow is to discuss electronically suspended doses with the doctor to ensure the patient does not need the dose. This did not occur and was often replaced by nurses believing 'suspended' was a decision not to give the dose. Therefore, nurses stopped administering the medication without question until the doctor has cancelled the suspended order without reminding them for a decision for that dose.

This new functionality therefore changed the method for measuring cardiac medication delays and thus impacted the reliability of this information as we had to investigate other sources of the EMR. Firstly, one had to find out if a medication had been suspended, then determine if there had been a delayed decision to administer that dose. This was done by reading components of the EMR: doctor and nurse documents, patient handover flowsheets, eMar and the clinical data viewer. Sometimes medications had been ordered on the eMar and given late by the nursing staff simply because the nurses were not informed that a new drug had been ordered on the EMR and the dose needed to be given immediately. We did not include dispensary delays as this did not affect the decision to administer a medication.

Delayed cardiac medications were again measured in hours and minutes from the due dosage time to the actual administration time on the medication chart, adjusted for the total number of cardiac drugs prescribed for each patient, the same as the first study. Each patient's cardiac drug administration delays were measured daily and accumulated over the duration of the patient's stay in CCU:

$$\frac{\text{Delays}}{\text{Drug count x LOS}}$$

where

Numerator = total number of delays (mins) in cardiac drug administration for each patient

Denominator = total number of cardiac drugs prescribed for each patient multiplied by the length of stay (LOS) in CCU (days). The same inclusion and exclusion criteria as study 1 was used.

Included all cardiac drugs: antiplatelets, P2Y12 and aspirin; beta blockers; ACE/ARBs; calcium antagonists; anti-arrhythmics; prazosin; digoxin; statins and antihyperlipidaemics; anti-anginals including perhexiline, nicorandil and nitrates; antihypertensives; diuretics, electrolyte replacement or other adjunctive agents given for treatment of cardiac conditions (e.g., sildenafil, sitagliptin, colchicine).

Excluded any cardiac medications that showed evidence from the EMR that instructions were documented in the ward round EMR note to give the dose at a later time, for example, to commence this evening or to start tomorrow. These were the only instructions related to medication delays that could be detected at the time.

3.24.2. Secondary outcomes

Secondary outcomes in Study 2 were as follows.

Time taken for key clinical activities:

1. Time taken to book imaging and intervention procedures: calculated as admission time or ward round time to the order time entered into the EMR, depending on type of procedure; for example, procedure orders are usually made on the ward round, while imaging orders are often made on admission
2. Duration of patient fasting: includes full fast, fast after a light breakfast and clear fluids
3. Total IDC insertion time

Nurse-led patient care clinical decisions – quantity of:

1. Patients that received documentation of cardiac rehabilitation and discharge advice.
2. Patients that remain on bed rest for more than 24 hours during their admission
3. Patients that have oxygen therapy in situ during their admission

Other measurements:

1. Length of stay
2. Readmission after 30 days
3. Staff interviews

3.25. Data collection

3.25.1. Source Data

This time all demographic, administrative and the time taken for key clinical activities were collected electronically from the EMR system only. Paper records were not required.

3.25.2. Observational data collection:

1. Ward round workflow over an intermittent 2-week period prior to the staff interviews when the primary investigator was on a shift or doing data collection in CCU
2. Staff interviews: audio recording

3.26. Bias

Elements of bias may have existed in the design of this study. Possible sources of bias were:

1. Selection bias due to this being a single-centre investigation located in the one clinical area – However, individual selection bias was mitigated by the nature of this clustered approach, creating lists of patients admitted according to time frame, diagnostic group and location of admission.
2. As with Study 1, the primary investigator, a clinical nurse researcher, was still rostered in CCU 2 days a week. This could not be avoided. As a nursing colleague, she did not have any hierarchical command over any of the senior CCU nurses or cardiac stream doctors that were interviewed. However, it is important to mention that the collegial relationship between the interviewer and interviewees may bear some influence on their responses to the interview questions. Interview participation was voluntary. As previously stated, in section 3.21.2 the element of coercion needs to be acknowledged, even though positive and trusting relationships exist between the participants and the nurse researcher.
3. Coding and thematic analysis was completed by the primary investigator alone. Due to time constraints, no other objective viewpoints were sought to interpret the thematic analysis. The nurse researcher's experience and insight were used to analyse the interview data.

3.27. Study size estimation

Sample size was estimated at 120 individual patient electronic medical records for the collection of quantitative data and 12 staff interviews. This was to match the 30 patients per cardiac stream estimation for study 1 and an estimation of at least 6 doctors and 6 nurses who would have participated in the 2-week ward round period and rostered during the interview period.

3.28. Statistical analysis

Continuous variables were reported as medians (with IQRs) and compared without further non-parametric tests. We merely wanted to see if the delays were maintained 1 year after the original intervention. Categorical variables were again reported as counts and percentages. The primary analysis of delay in medication decision making included the modified intention to treat population (i.e. all patients admitted between 1600hrs on Sunday night and 1000hrs on Friday morning). For Study 2, quantitative data was analysed in Microsoft Excel databases.

3.29. Data security handling

The EMR system was accessed according to confidentiality agreements, ethical professional practice of the primary investigator and the ethics amendment as written in the amended protocol according to the 2021/HRE00002. The EMR system was accessed to audit the 2022 primary and secondary endpoints as discussed above.

Appropriate measures were taken to ensure the security of personal data (including restricted access to computer databases). Research-specific records and documents pertaining to the conduct of this study must be retained by the investigator for 15 years after study completion, unless local regulations or institutional policies require a longer retention period. No records may be destroyed during the retention period without the written approval of the primary investigator. No records may be transferred to another location or party without written notification to the primary investigator.

Patient audit records and staff interviews were de-identified to protect participant identity. Data management for Study 2 followed strict guidelines for confidentiality and safe data storage, as per the ethics-approved protocol.

The study site agreed to allow the study team and appropriately certified and credentialed auditor designees to have direct access to department records for review and verification if required. The study team performed ongoing monitoring, including source data verification, to confirm that data collected for the study by authorised site personnel were accurate, complete and verifiable from source documents wherever possible; that the safety and rights of participants were being protected; and that the study was conducted in accordance with the currently approved protocol and any other study agreements, International Conference on Harmonisation guidelines for good clinical practice (ICH GCP), and all applicable regulatory requirements. The confidentiality of the

data verified and the protection of the participants was respected during these inspections. It is understood that the study team personnel are bound by professional confidentiality and, as such, will not disclose any personal identity or personal medical information.

Appropriate measures were taken to ensure the security of personal data (including restricted access to computer databases). Research-specific records and documents pertaining to the conduct of this study must be retained by the investigator for 15 years after study completion, unless local regulations or institutional policies require a longer retention period. No records may be destroyed during the retention period without the written approval of the primary investigator. No records may be transferred to another location or party without written notification to the primary investigator.

Participants in the staff interviews were de-identified when recording the interviews and transcribing the results into an electronic database as written text by the primary investigator. The identity of doctors and nurses was only required when they chose to participate in the interviews and was not recorded. Written consent was obtained. Consent forms were sent securely to the South Australian Department of Human Services who holds this information confidentially.

3.30. Ethical considerations

A request for ethics amendment was made to the SALHN Office for Research in November 2022 (2021/HRE00002). A resubmission was made in December 2022, and approved on 9 January 2023. See Appendix 18 for amendment approval notification. Data collection via the EMR system commenced by the end of January, with interviews starting in late February 2023. All data was collected by the primary investigator. Refer to Appendix 25 for interview questions.

Briefly, the protocol was amended to address the following content:

1. Confidentiality: All interviewees were de-identified.
2. Consent: Participation was voluntary. All participants were fully informed of the project and a written, signed consent was obtained from all participants.
3. Harm: Risk of harm to participants was considered to be low.
4. Data security: As with data collection for study 1, the same security measures were in place: secure onsite office for storage of hard copy consents, secure computer university databases for storage of interview data and analysis.

5. Publications and dissemination of outcomes: As with the previous protocol, considerations for publication approval and authorship were addressed so as to maintain a consensus and agreement by all parties involved in the research project, including the research institution/hospital, with any substantial contribution to be recognised.

3.31. Methods conclusion

This study was designed to improve the delivery of cardiac stream ward rounds so that patients received their medical and nursing care sooner. The new ward round model incorporated structural changes to support teamwork amongst doctors and nurses, as well as patient inclusion. These changes included increased stakeholder participation, better communication opportunities, a checklist/document tool and patient feedback. The multimethod approaches used for Study 1 and 2 facilitated a thorough investigation of mechanisms that influence the timely delivery of patient care.

Both qualitative and quantitative measurements were required to ascertain timeliness of patient care delivery, and the attitudes, satisfaction and compliance of staff with the new ward round design, to see if there was a culture change between team members. The second study compared the future state of practice with the initial study intervention to see if there were any changes to the timely delivery of patient care and cohesive teamwork.

The next chapter reveals the results for both studies, comparing the primary and secondary endpoints, as well as the patient satisfaction ratings, at the time of the intervention with quantitative measurements repeated at 1 year The results of staff interviews 1 year after the intervention will also be presented, showing the attitudes and compliance of staff with the new ward round practice when there is still only one cardiac nurse available for all the weekday ward rounds.

CHAPTER 4. RESULTS

4.1. Introduction

This research used a multimethod approach, that is, quantitative and qualitative methods, to research the CCU ward round. We implemented the re-engineered ward round in the initial study (Study 1), and then completed a 1-year follow-up study (Study 2). The initial ward round study recruited 206 patients (control n=101, intervention n=105). Median time to cardiac medication administration was significantly shorter in the intervention cycle (intervention: 0 hr/med [IQR 0–0.5] versus control: 0.2 hr/med [IQR 0–1.2]; p=0.012). Heart failure patients had the most significant improvements (intervention: 0 hr/med [IQR 0–0.03] versus control: 0.9 hr/med [IQR 0.3–1.6]; p<0.001). Secondary endpoints trended towards improvement in all ward rounds, but results did not reach statistical significance.

In the 1-year follow-up study, EMRs of 115 patients were reviewed at the same period 1 year after Study 1. There was no evidence of sustained improvement in the primary and secondary endpoints. For all streams combined, median time to cardiac medication administration was 0.11 hr/med (IQR 0–1.84) in the follow-up study versus 0 hr/med (IQR 0–0.5) during the intervention. Improvements among heart failure patients were not maintained either (follow-up study: 0.09 hr/med [IQR 0–1.05] versus intervention: 0 hr/med [IQR 0–0.03]).

Interviews with six cardiac nurses and seven doctors showed that nurses want to be on the ward round, and doctors want and value cardiac nurses' knowledge and expertise on and off the ward round. A thematic analysis showed that a culture of trust and respect already existed between senior medical and nursing staff. Communication and workload issues were preventing their ability to function as a team. Therefore, the concept of cardiac nurse streaming has been suggested as a positive practice change that can ensure cardiac patients receive timely quality care all the time and contribute to building a centre of excellence.

Results will be reported in more detail according to the following objectives:

Study 1 – Ward round study – re-engineering the cardiology ward round

Timely delivery of patient care, as reflected in primary and secondary outcomes:

Objective 1. Evaluation of team culture

Objective 2. Understanding of how nurse advocacy and senior support influences clinical decision making

Objective 3. Enhancement of communication within a teamwork environment that promotes clinical decision making

Objective 4. Bringing doctors and nurses together to improve team interactions that reduce patient care delays

Patient satisfaction and understanding of their treatment plan:

Objective 5. Evaluation of satisfaction and understanding through staff and patient surveys

Study 2 – Ward round follow-up study

Sustainability of improved quality and timely delivery of patient care 1 year later:

Objective 6. Evaluation of sustainability by comparing primary and secondary endpoints, and through staff interviews

STUDY 1: WARD ROUND STUDY – RE-ENGINEERING THE CARDIOLOGY WARD ROUND

4.2. Results for Objectives 1 to 4

Objective 1

Evaluate team culture and effective decision making after re-engineering the cardiology ward round (introducing changes to traditional ward round practice and workflow), by measuring patient care delays, particularly cardiac medication administration delays, and through patient and staff surveys.

Objective 2

Understand whether nurse advocacy and senior support can contribute to efficient clinical decisions by comparing ward rounds with and without nurse presence, by measuring cardiac medication administration delays and delivery of key clinical patient care activities.

Objective 3

Determine whether the re-engineered ward round enhances the clinical decision making and communication environment to deliver more timely quality patient care, by measuring cardiac medication administration delays and delivery of key clinical patient care activities.

Objective 4

Develop an intervention that assists cardiac doctors and nurses in making evidence-based clinical decisions by providing more opportunity for staff interaction and successful situational awareness to reduce patient care delays in and out of hours; the primary outcome, delays in the administration of cardiac medications, will indicate the impact of this intervention on team culture.

4.2.1. Participants

A total of 199 patients, yielding 206 episodes of care, were included in the 12-week study, surpassing the estimated sample size of 180 patients. Nine patients were in hospital for both the control and intervention periods, due to their duration of hospital stay during the 12-week study period. A new intervention episode of care was created for seven patients breaching the control period and becoming part of the intervention, with three new episodes of care for patients breaching the intervention period and moving into the control period. There was only one patient who contributed two episodes of care when they were readmitted during a separate intervention period. Therefore, the total episodes of care were 206, with 101 for the control ward round (99 patients) and 105 for the intervention ward round (100 patients).

4.2.2. Cohort characteristics

The mean age of patients in the control and intervention groups was similar: 68.1 (SD $\pm$13.7) years for the control group compared to 64.9 (SD $\pm$14.7) years for the intervention group. The control and intervention groups in the ACS Stream had similar mean ages to control and intervention groups overall. However, the ARR stream intervention group was older at 71.6 (SD $\pm$14.8) years, as was the HFS stream control group at 73.5 (SD $\pm$13.7) years.

There was a male predominance in the study population, even when analysed by clinical stream. This male predominance was most striking within the intervention arm of the ACS stream.

Overall, the length of stay was shorter by over a day for the intervention group (control 5.7 SD$\pm$11.7 days; intervention 4.5$\pm$4.6 days; see Table 4.1). Within streams, analysis suggested

patients in the intervention ACS and HFS streams also had a shorter length of stay (ACS: 4.9 versus 6.3 days; HFS: 5.5 versus 7.6 days), but not the ARR patients (2.2 versus 2.0 days). Non-parametric tests were used to interpret any significance in these values as per Table 4.1.

There was the suggestion of an increase in readmission after 30 days for the intervention group, with 20 patients having 39 readmission episodes compared to the control of only 11 patients with 12 readmissions (p=0.063), but this difference, although close, did not reach statistical significance. A higher rate of readmission was also seen in the intervention group in each individual clinical stream. Refer to Table 4.1.

We can conclude that the control and intervention groups contain a similar population of patients.

Table 4-1: Ward round study population

Variable	Control n=99	Intervention n=98	*p value
Population (count)			
All streams	99	98	
ACS	54	59	
ARR	22	19	
HFS	23	20	
Episodes of care (count)			
All streams	101	105	
ACS	54	59	
ARR	22	19	
HFS	25	27	
Age (years), mean (SD)			
All streams	68.1 (±13.7)	64.9 (±14.7)	
ACS	66.2 (±11.7)	64.2 (±12.4)	
ARR	67.0 (±16.9)	71.6 (±14.8)	
HFS	73.5 (±13.7)	62.5 (±19.5)	
Gender, male (%)			
All streams	60	70	
ACS	52	73	
ARR	73	70	
HFS	65	67	
Length of stay (days), mean (SD)			
All streams	5.7 (±11.7)	4.5 (±4.6)	p=0.546
ACS	6.3 (±13.5)	4.9 (±5.0)	p=0.398
ARR	2.0 (±1.3)	2.2 (±2.1)	p=0.786
HFS	7.6 (±12.4)	5.5 (±4.4)	p=0.604
Readmission rates (admission events: patient number)			
All streams	12:11	39:20	p=0.063
ACS	10:9	15:11	p=0.436
ARR	1:1	6:4	p=0.089
HFS	1:1	18:6	p=0.215

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service; SD = standard deviation
** p value significance = 0.05*

4.3. Outcome data and main results

4.3.1. Primary outcome: Cardiac medication delays

The three 4-week rotations occurred in line with RMO cardiology placements. Delays in cardiac medication administration were captured, and the re-engineered ward round structure was compared to the standard ward round system. The accumulation of cardiac drug administration delays (in minutes) for each patient was measured over their entire length of stay (days) and adjusted for the total number of individual cardiac medications prescribed for that patient.

Table 4.2 shows the data for all streams combined was skewed as the IQRs showed a mismatch between the cardiac medication administration delays mean values in the control and intervention groups: in the control group – IQR 0–1.21, median 0.24, mean 1.02; and in the intervention group – IQR 0–0.52, median 0, mean 0.54. Cardiac medication delays were significantly shorter in the intervention cycle for all streams combined (intervention: median 0 hr/med [IQR 0–0.5] versus control: 0.2 hr/med [IQR 0–1.2]; p=0.012). A more obvious effect was seen in the heart failure stream (25% of the cohort) (intervention: median 0 hr/med [IQR 0–0.03] versus control: 0.9 hr/med [IQR 0.3–1.6]; p<0.001; interaction p value=0.011). See Table 4.2 and Figure 4.1.

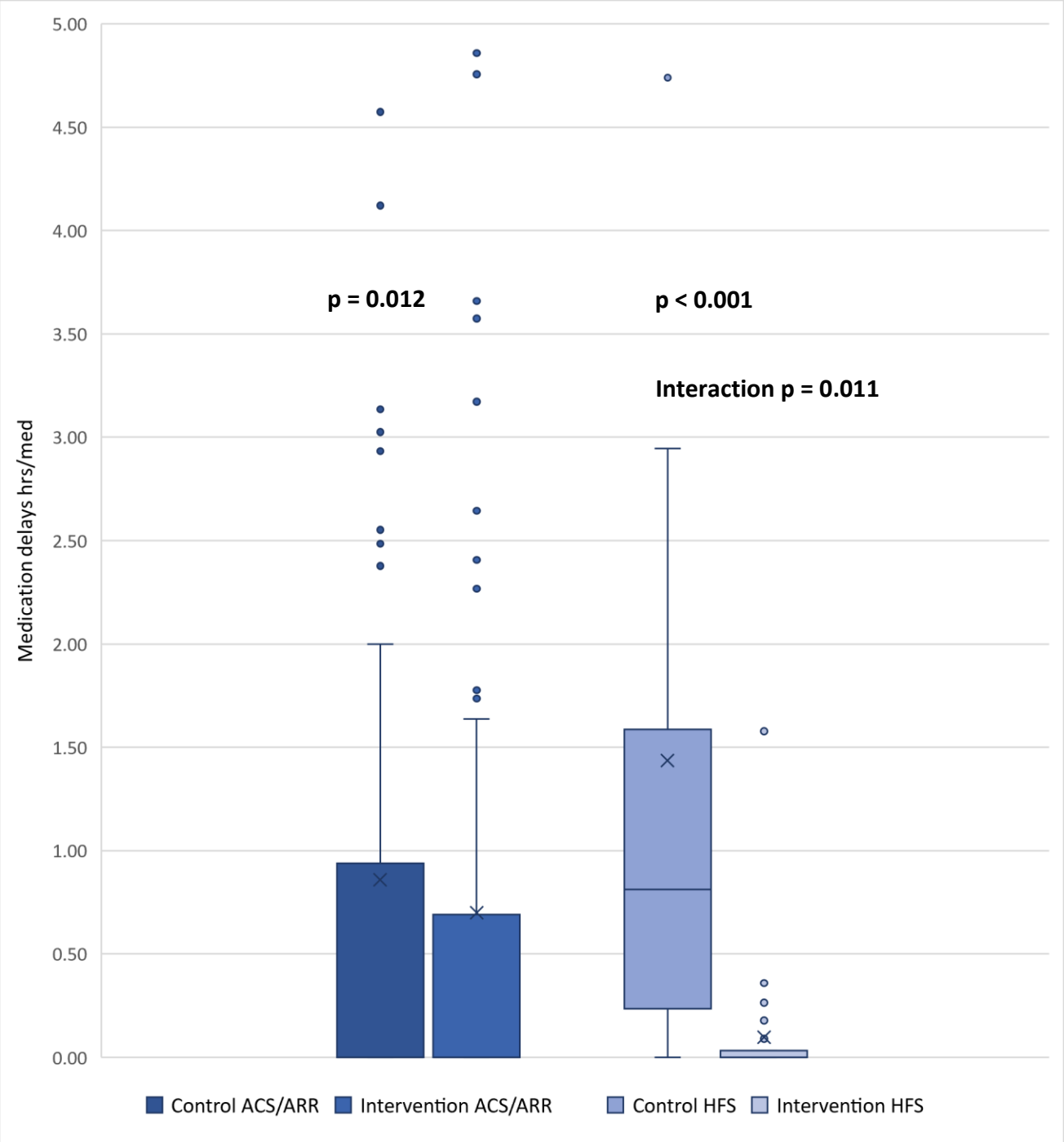
Table 4-2: Primary endpoint: cardiac medication delays (Kruskal–Wallis/Chi^2 with ties)

Variable	Control n=101		Intervention n=105		
n=Control: Intervention	**Median delay (IQR) (hr/med)**	**Mean**	**Median delay (IQR) (hr/med)**	**Mean**	**p value***
All streams	0.2 (0–1.2)	1.02	0 (0–0.52)	0.54	0.012
ACS stream n=54:59	0 (0–0.40)	0.59	0 (0–0.60)	0.63	0.44
ARR stream n=22:19	0.67 (0–2.30)	1.53	0.85 (0–0.85)	0.92	0.19
HFS stream n=25:27	0.94 (0.30–1.6)	1.51	0 (0–0.03)	0.10	**< 0.001**

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service; hr/med = hours per medication; IQR = interquartile range

** p value significance = 0.05*

Figure 4.1: Study 1: Cardiac medication delays by cardiac stream



ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service
p value significance = 0.05
Notice significant drop in medians and interquartile ranges (represented by bars) for the intervention, comparing ACS and ARR streams combined with HFS alone. The HFS stream displays the most significant reduction in cardiac medication delays represented by the smallest box.

4.3.2. Secondary outcomes

Overall, all streams showed positive results for most endpoints (length of stay, booking delays, mobility, education); however, these differences did not all reach statistical significance. Table 4.3 shows results of the Kruskal–Wallis and Chi-square tests for length of stay, booking delays and fasting times.

Table 4-3: Secondary endpoints: length of stay, booking delays and fasting times (Kruskal–Wallis/Chi^2 with ties)

Variable		Control n=101		Intervention n=105	
Time	**Mean**	**Median percentile (IQR)**	**Mean**	**Median percentile (IQR)**	**p value***
Length of stay (hours)					
All streams					
ACS	135.99	64.25 (13–124)	109.05	64.83 (13–121)	0.55
ARR	150.56	60.12 (10–96)	116.82	64.75 (15–121)	0.40
HFS	47.14	40.40 (15–51)	49.66	41.82 (15–61)	0.80
	182.67	108.45 (33–188)	131.07	104.1 (11–188)	0.60
Booking delays (minutes)					
All streams	994.64	150 (0–1140)	529.85	60.0 (0–660)	**0.015**
ACS	1291.00	225 (0–1785)	536.59	120.0 (0–720)	**0.007**
ARR	522.10	90 (0–600)	516.39	0.0 (0–725)	**0.004**
HFS	770.36	120 (0–960)	496.54	7.5 (0–300)	**0.007**
Fasting times (minutes)					
All streams	661.52	540 (0–1020)	548.93	420 (0–883)	0.19
ACS	759.43	630 (0–960)	671.12	570 (0–990)	0.50
ARR	667.73	405 (0–883)	620.00	660 (0–870)	0.15
HFS	444.60	0 (0–1020)	243.46	0 (0–600)	0.90

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service; IQR = interquartile range
** p value significance = 0.05*

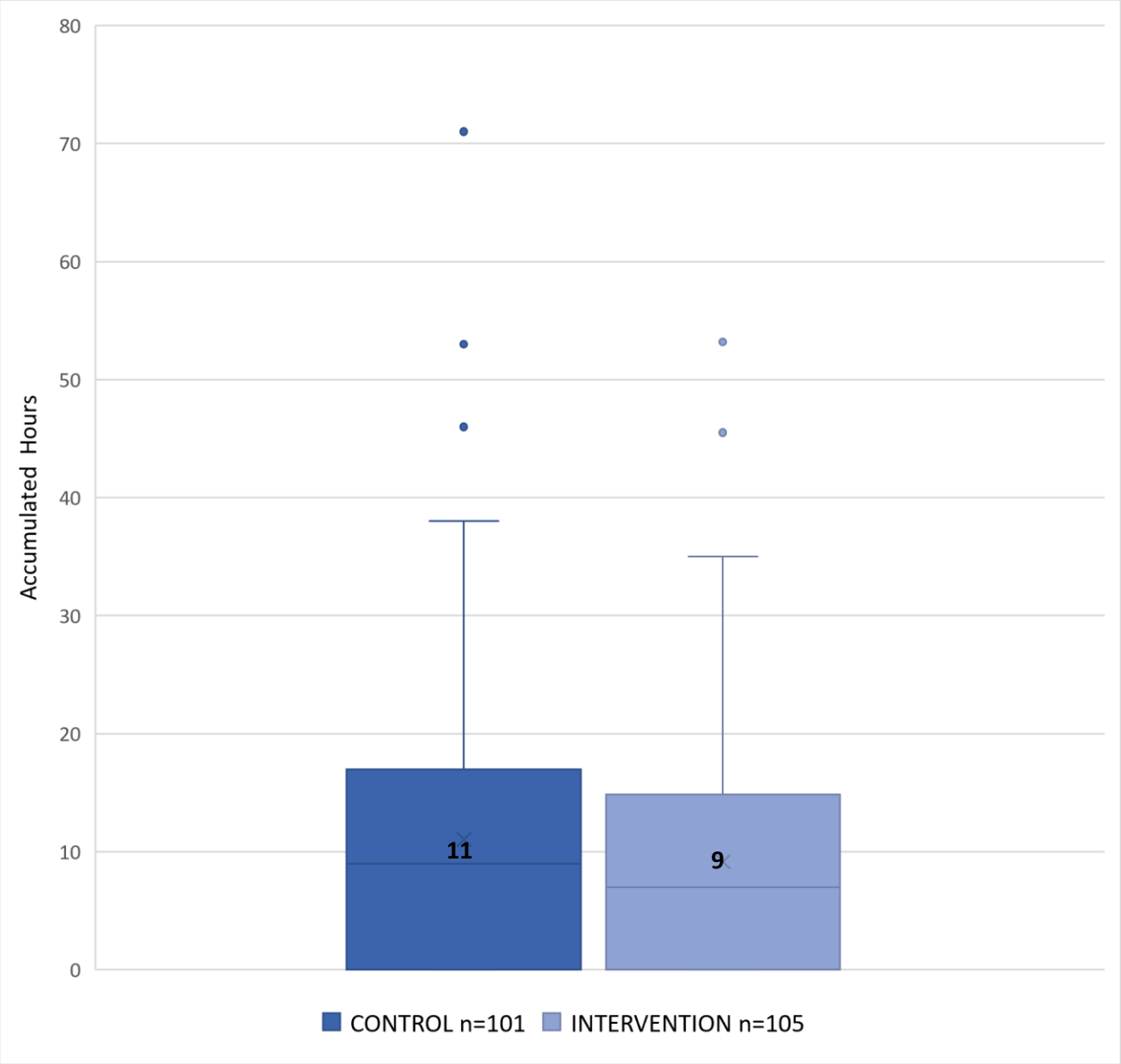
Length of stay, booking delays

Length of stay did not show any statistical improvement during the intervention period; however, there was a small reduction in booking delays (see Table 4.3). Most bookings were for echocardiograms (echo), angiograms and cardiac MRI. Most echo booking requests were faxed by doctors immediately upon the patient's admission. Requests for angiograms and magnetic resonance imaging (MRI) and some echoes were decisions influenced by the ward round and would be booked because of a clinical decision from the cardiologist and the registrar.

Fasting times

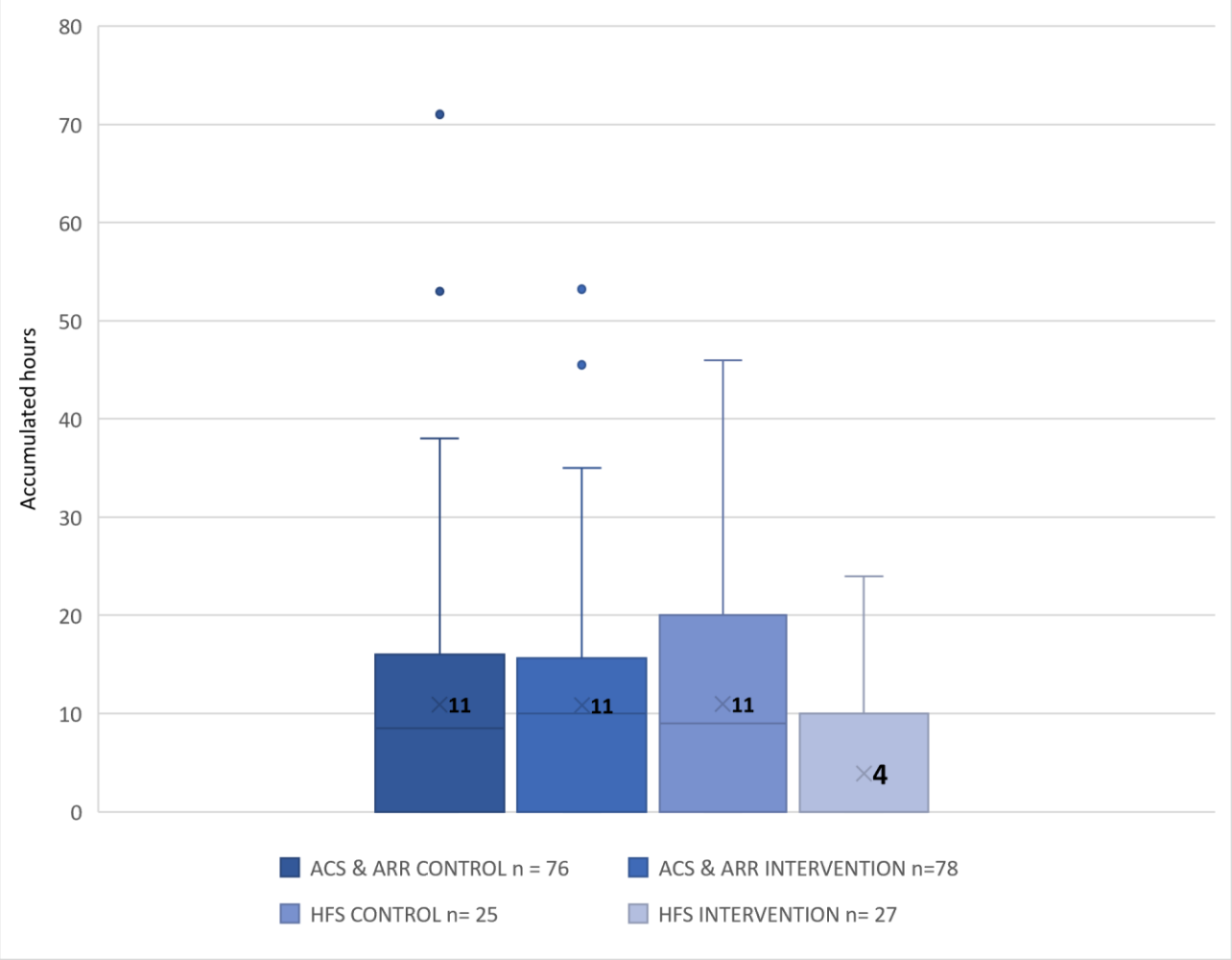
Patients accumulate fasting hours during their admission due to repeated and ongoing preparation for cancelled or unbooked procedures. Most patients fast between 0 to 38 hours during their stay in CCU. Table 4.3 points out that fasting times were not significantly reduced in the intervention group; however, the raw data shows the average total fasting mean time was 11 hours for the control group and 9 hours for the intervention group. See Figure 4.2. Comparing the HFS stream alone with the ACS and ARR streams combined, the box and whisker graph in Figure 4.3 shows a mean drop-in total fasting time to 4 hours in the heart failure intervention group.

Figure 4.2: Total fasting times for all three cardiac streams combined



Mean values displayed on box and whisker graph

Figure 4.3: Total fasting times in ACS and ARR streams combined compared with HFS stream alone

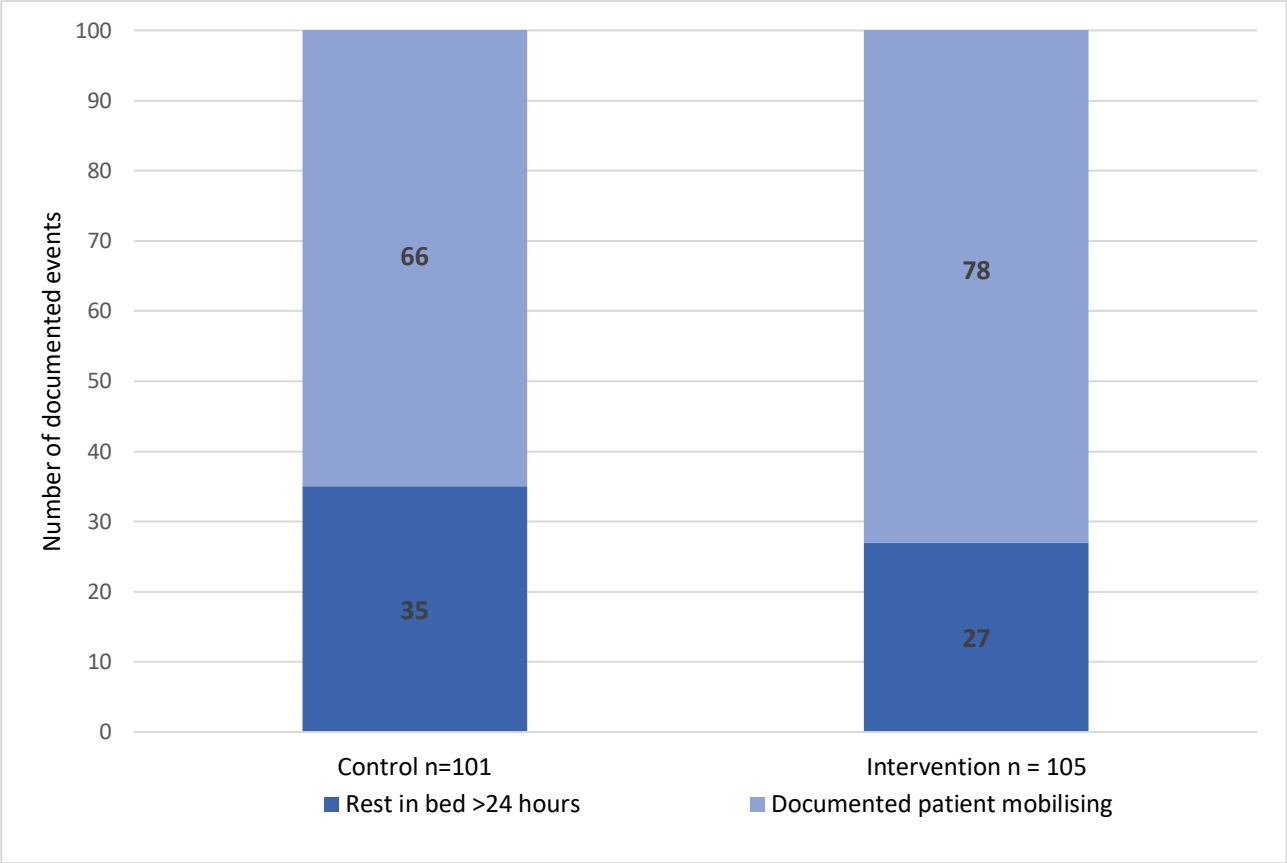


ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service
Mean values displayed on box and whisker graph

Resting in bed for more than 24 hours

For all streams combined, approximately 66% of patients in the control group and 78% of patients in the intervention group had prolonged periods of bed rest. See Figure 4.4. According to paper nursing notes, more patients in the control group (35%) were in bed for longer than 24 hours compared with patients in the intervention group (27%). There did not seem to be a difference resulting from the ward round intervention.

Figure 4.4: Bed rest for more than 24 hours



IDC insertion time

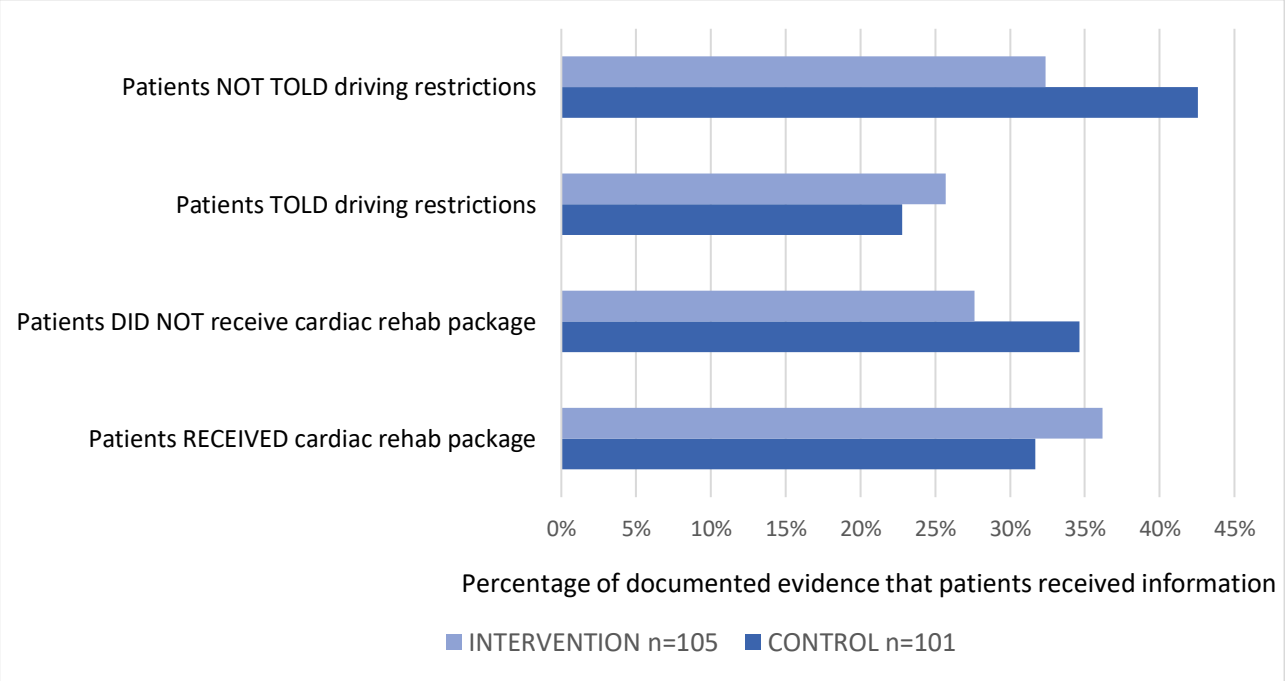
A small number of patients in both study arms had an IDC inserted: six in the control group and seven in the intervention group. Patients in the control and intervention groups had their IDC inserted for an average of 2.8 and 2.2 hours respectively. This is a difference of 36 minutes. Because this is a small cohort of patients with only a slightly shorter IDC time, it will not be clinically significant to the patient. We cannot conclude that the intervention empowered nurses to make better decisions that contributed to the shorter IDC insertion time.

Cardiac rehabilitation

Cardiac rehabilitation is a crucial component of care aimed at improving patient outcomes and preventing secondary events, (Beleigoli et al, 2021). All ACS patients should receive patient education packages and driving instructions prior to discharge and commencement of their formal cardiac rehabilitation program. The policy was to document into the patient notes, when they receive this information. As shown by Shaughnessy and Jackson, (2015), the audit process can help evaluate a new ward round model. The medical record was therefore audited to see if patients had received their cardiac rehabilitation materials and driving instructions.

Relieving and junior non-cardiac-trained nurses provide direct patient care to CCU patients and are not familiar with cardiac-specific patient education requirements. We wondered if a cardiac nurse attending the ward round would follow the checklist to instigate and facilitate patient education, particularly ensuring that ACS myocardial infarction patients received their cardiac rehabilitation packages and driving instructions. Results showed a small and non-significant effect in the intervention group, with approximately 10% more patients receiving their cardiac rehabilitation folders and driving instructions during the intervention arm (see Figure 4.5).

Figure 4.5: Receipt of cardiac rehabilitation by patients in the ACS stream (Audit)



ACS = acute coronary syndrome, rehab = cardiac rehabilitation
NOT TOLD and DID NOT = no documented evidence in the medical record and ward round proforma checklist
Percentages = within separate intervention and control numbers.

Even though there was a perceived improvement during the intervention, Figure 4.5 shows that 35% of control group patients did not receive their cardiac rehabilitation packages which reduced to 28% for the intervention. 43% of patients did not know their driving restrictions outside of the intervention. The new ward round improved informing patients about their driving instructions by 3% for being told and reduced those that were not informed by 11%. This data was collected retrospectively by reading patients' medical records. Therefore, this discrepancy could be due to poor documentation rather than a true failure to deliver cardiac rehabilitation and driving instructions to our myocardial infarction patients.

4.4. Results for Objective 5: Patient and staff survey results

Objective 5

Deliver patient treatment plans specifically understood and accepted by the patient and all members of the cardiac streaming team, so that patient care is delivered sooner; staff and patients will be surveyed to measure their understanding about treatment plans.

4.5. Patient survey

All 199 patients were surveyed. They had the choice to opt out. Surveys revealed a high patient satisfaction rating with the overall care they received for both the control and intervention ward rounds. We also observed that patients want to be involved in the clinical decisions about the care they receive, even though they do not necessarily understand the details of the treatment.

4.5.1. Patient-reported outcomes

A total of 191 surveys were returned out of 199 patients included in the survey: 94 patients in the intervention group and 97 patients in the control group. The discrepancy of 8 patient interviews could not be explained as all were manually recorded on a register for consent and survey acquisition. The survey was written on Qualtrics and surveys were conducted using an Apple iPad, relying on wi-fi connection to the Flinders University. There may have been a technical issue that failed to record the outlying 8 survey results. Some patients were comfortable completing the survey on the iPad without assistance. The primary investigator assisted some patients complete the survey by asking them the questions and placing their answers into the Qualtrics application.

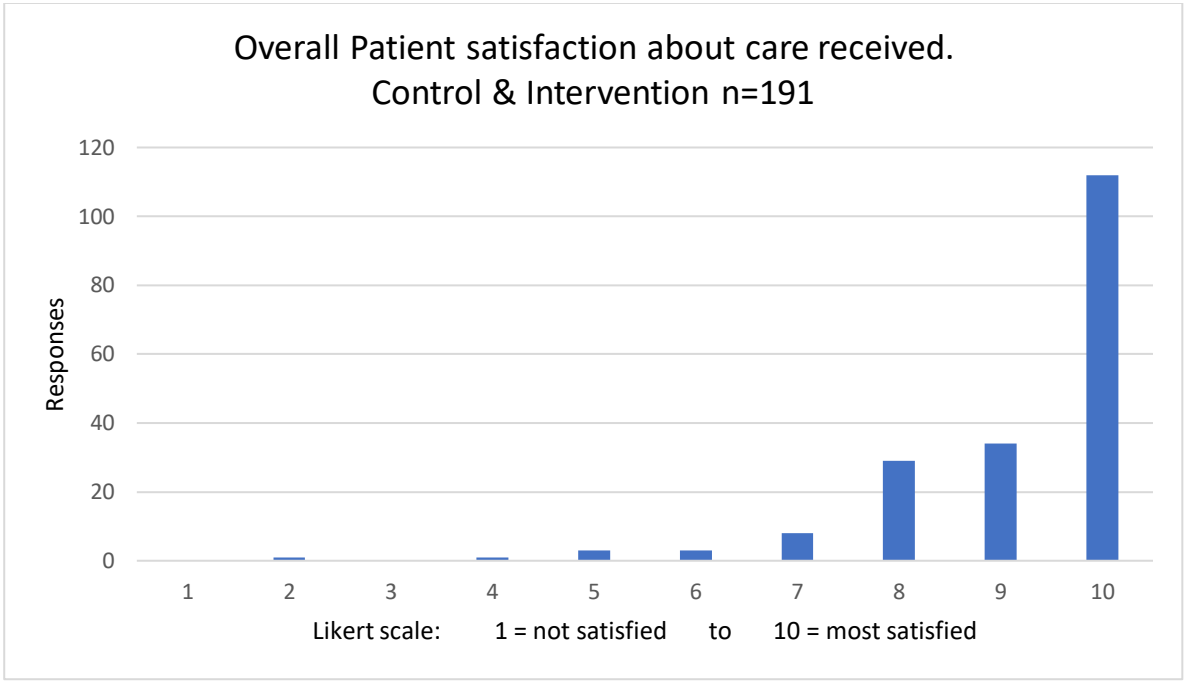
4.5.2. Patient satisfaction

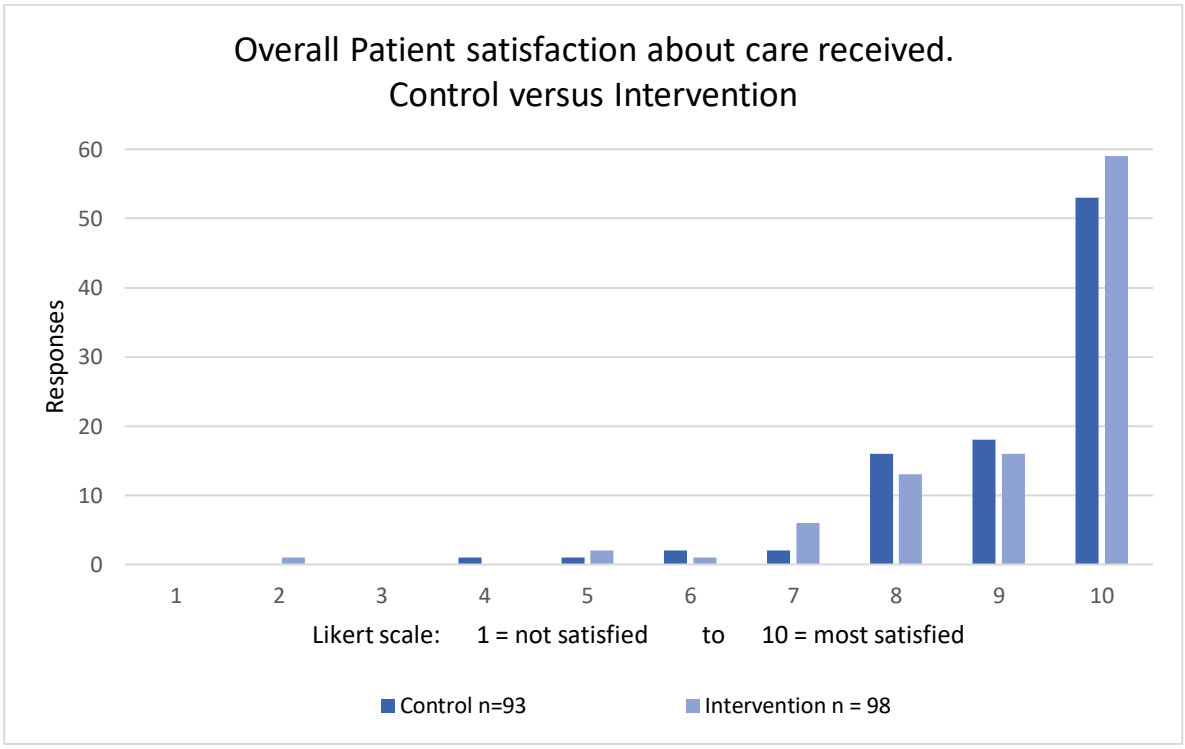
Patients were surveyed following the first time they were seen by their cardiac stream ward round in CCU. There were no historical controls, however, the Nurse Unit Manager observed that it is rare to receive complaints from CCU patients. Generally, most patients were satisfied with the care provided within the first 24 hours of their admission to the CCU. Patients rated their satisfaction between 0–3 not satisfied at all, 4–7 somewhat satisfied and 8–10 extremely satisfied.

All scores were generally high and comparable between the control and intervention groups, especially patient satisfaction with the care they received: 77% of both the control and intervention groups scored 9 and 10, a high Likert scale and net promoter score, meaning a high satisfaction rating. See Figure 4. 6. It is difficult to explain these figures as patient conditions range between acute to acute on chronic. Some receiving a definitive diagnosis and treatment plan after

the first ward round and some still requiring more investigation. The question was about their overall satisfaction following the first ward round. The question may have been too generic and will require more detail when assessing future ward round studies.

Figure 4.6: Patient satisfaction ratings using Likert scale 1 to 10





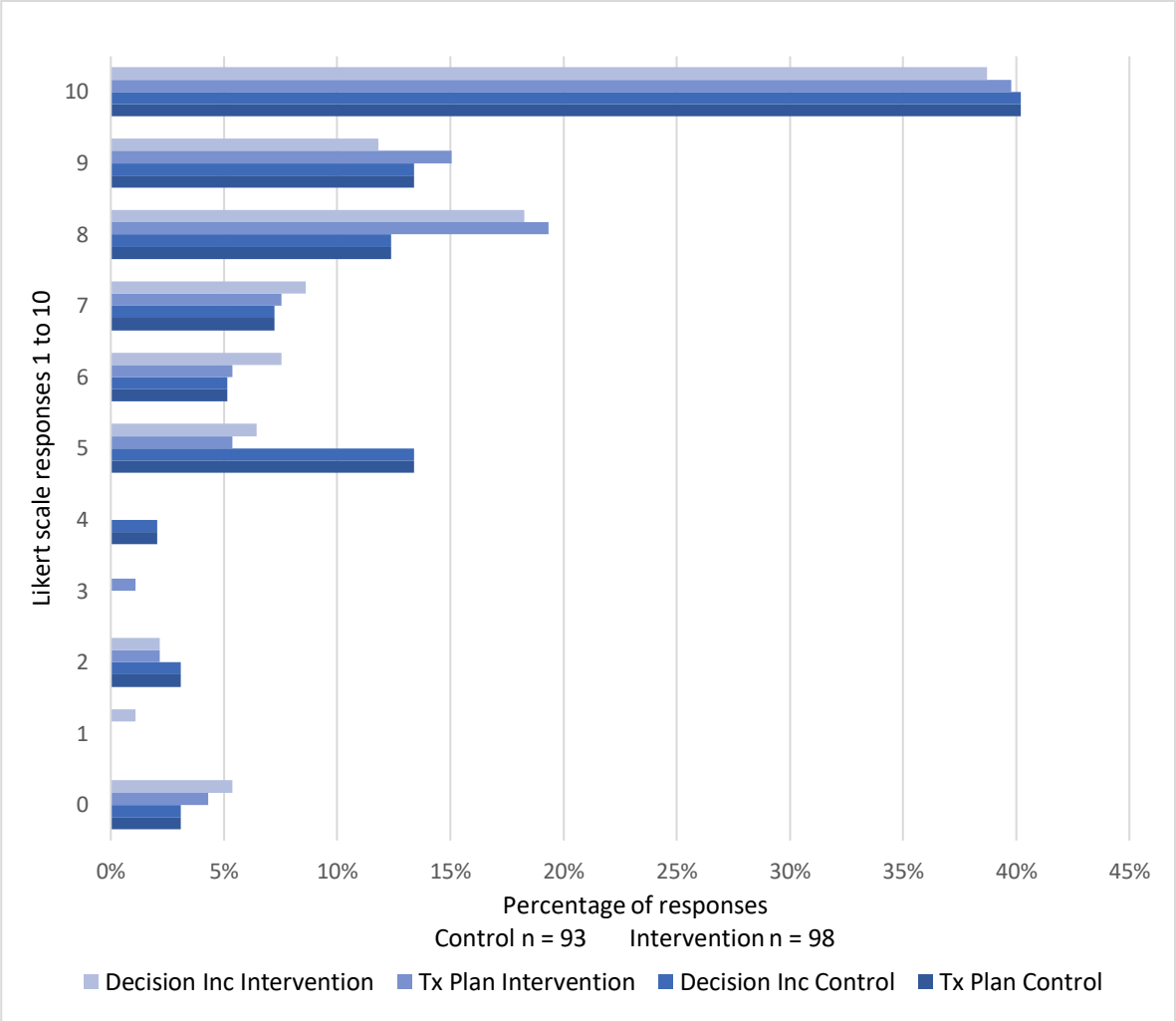
4.5.3. Patient inclusion in treatment plan decisions

The new ward round model did not seem to make a difference to how patients felt about their understanding of and inclusion in treatment decisions. However, <15% of both groups of patients rated this as 5 or below on the Likert scale. Figure 4.7 shows the comparison between patients feeling they understood their treatment plan and whether they felt included in the treatment decisions.

Most patients felt they understood and were included in their treatment plan, although some patients did voice that they trusted in the medical advice without question and did not need to understand or decide upon their own treatment. These patients preferred to score 5 out of 10 for both questions; however, some patients stated that although they did not understand their treatment plan, they did feel they had a choice about their care.

These results have not been analysed for differences between the three cardiac streams, but anecdotal comments from some patients with acute admissions for heart failure and STEMI indicate they felt their illness left them no choice but to follow medical advice without question due to their high-risk illness. The STEMI patients decompensated, and acute heart failure patients received emergency treatment prior to their first ward round, so they did not have a lot of time to process what was happening to them at the time.

Figure 4.7: Patients' perceptions regarding understanding and feeling included in decisions about their treatment plan



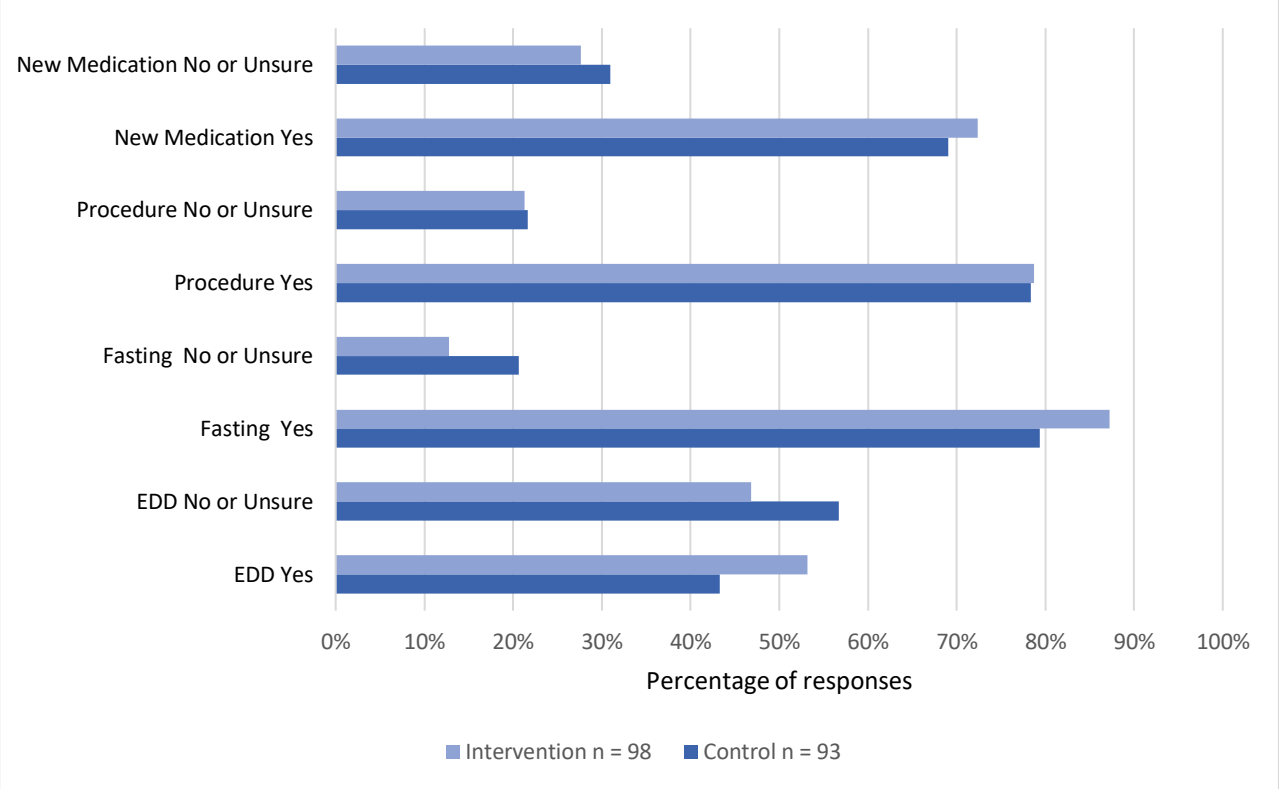
Decision Inc = patient inclusion in treatment decisions; Tx Plan = patients understanding their treatment plan

4.5.4. Key clinical activities

Figure 4.8 reflects an affirmation of patient understanding about schedules for tests and procedures, fasting, expected date of discharge, and knowing they were started on new medications. It is promising to know that most patients were informed about their care.

About 45% of intervention patients and 55% of control patients did not know or were unsure of their expected date of discharge; however, during the intervention, 10% more patients knew when they were expected to go home.

Figure 4.8: Patient knowledge after ward round: length of admission, fasting status, pending procedure or test, and commencing new medication



EDD = expected date of discharge

4.5.5. Fasting status

Patient fasting status was not always determined by the ward round as new admissions or changes in a patient's condition overnight often dictated the need for nurses to pre-empt a fasting status in case a patient required a morning procedure following ward round. The ward round in both control and intervention arms dictated a continuance or commencement of fasting for the patient.

To ascertain patient fasting knowledge the survey question was: "At this very moment, do you know if you are fasting for a procedure?" If the patient knew they were not fasting, this was taken as a "yes", as the patient knew their fasting status. It is encouraging that most patients in both groups were informed of their fasting status, as fasting decisions are also made outside of the ward round. See Figure 4.8.

4.5.6. Commencing new medications

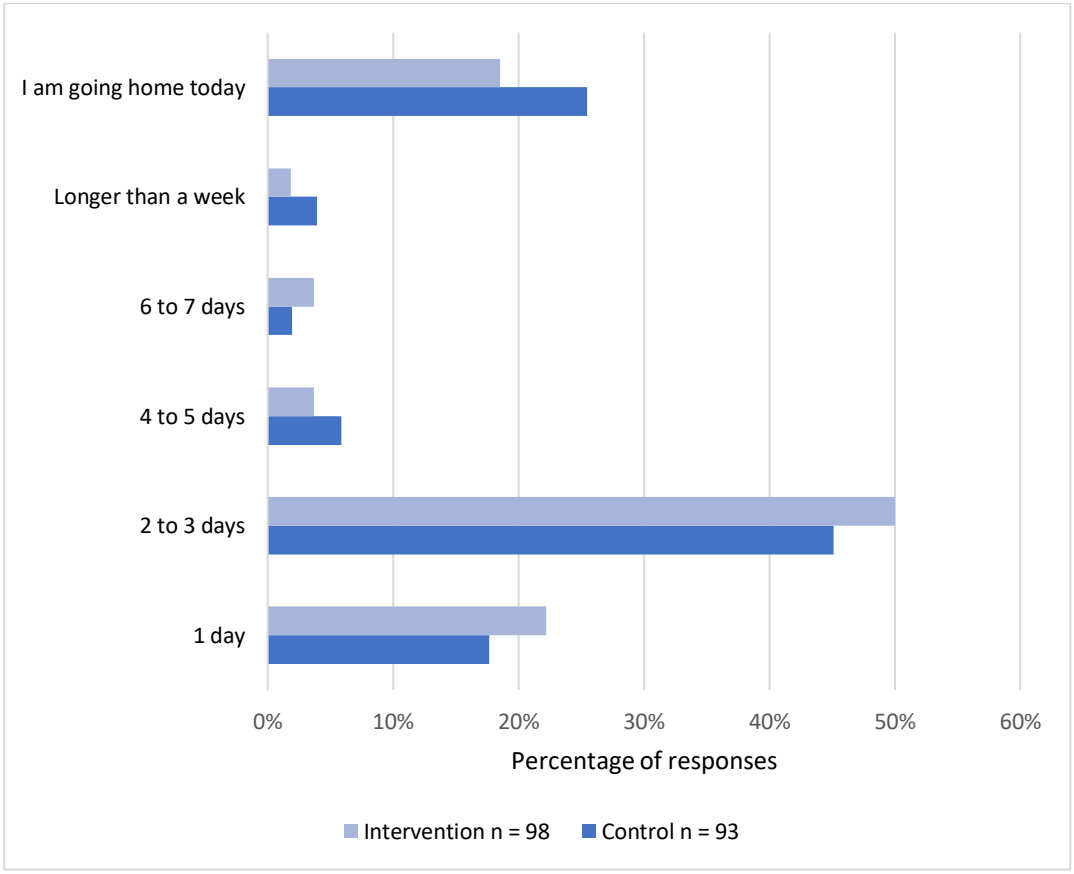
Asked if they knew about any new medications they may have started, most patients (70%) knew that they had started a new drug treatment, with a minor difference between the control and intervention groups, with 3% more patients replying yes in the intervention group. This means that 30% of patients were not necessarily aware of any new medications or whether they had not been

started on a new drug regimen (Figure 4.8). Remembering that this survey was taken within 24 to 48 hours of admission, following the first ward round in CCU, patients may not be able to process all the new knowledge during the acute phase of their illness. All patients were encouraged to ask about the drugs they were receiving from the nurse, and were told that medication education would be provided prior to discharge, especially when the pharmacist spoke to them (Cheng, 2018).

4.5.7. Expected date of discharge

Patients were asked if they knew how long they will be staying in hospital. Both the control and intervention groups did not inform at least 45% of their patients about their expected date of discharge at the first ward round after admission. Out of the informed patients 34% of control patients and 40% of intervention patients were given a 1 to 3 day estimate of how long they would stay in hospital. Figure 4.9 shows that 5% more patients seemed better informed in the intervention arm when comparing the 1 day and 2 to 3 day results. The control arm were 7% better at informing patients that they were going home on the day of their first ward round.

Figure 4.9: Knowledge of expected date of discharge



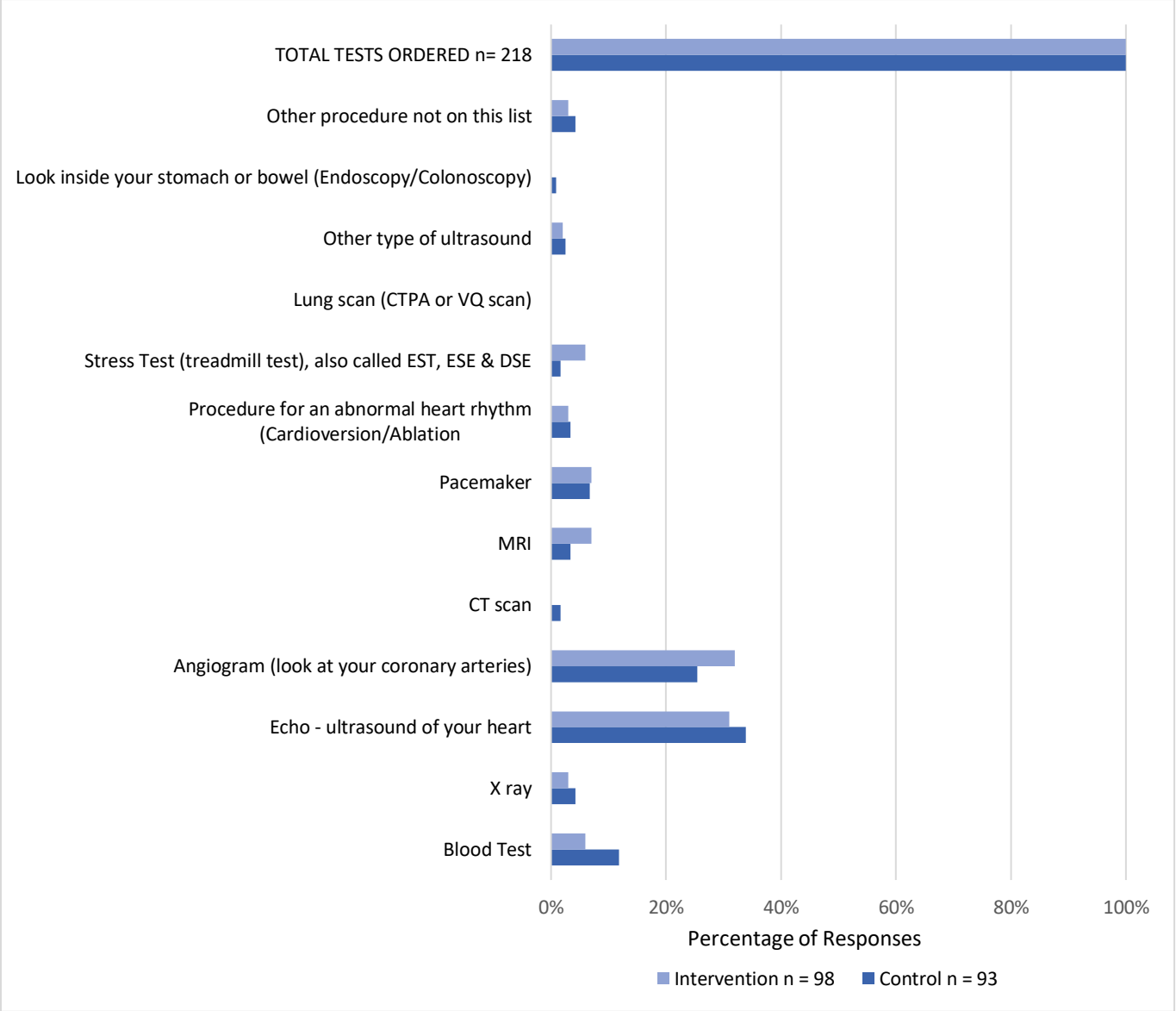
Responses supplied by patients who were aware of their expected date of discharge following the ward round.

It was interesting to note the high turnover rate for CCU patients: 45% of patients in the control group and 50% in the intervention group stayed for 2–3 days, and 18% of the control group and 25% of the intervention group were discharged following their first ward round. Analysing this data by cardiac stream is likely to reveal shorter lengths of stay for ARR and ACS patients. This is because HFS patients often have more comorbidities, are sicker and have complex treatment pathways that can keep them in hospital for longer. It is not always possible for HFS patients to know how long they were going to stay in hospital on their first day in hospital. This could account for the large percentage of patients not informed of their expected discharge date.

4.5.8. Tests and procedures

Patients were asked if they knew about the tests and procedures they were having. A majority (78%) of patients in both intervention and control groups knew which tests they were having and could state what they were. These tests are displayed in figure 4.10. Sometimes the tests were ordered before the ward round and the patient still understood they were having them. The ward round did not necessarily prompt the ordering of chest x-rays, echocardiography and other radiology as they were ordered prior to the ward round. However, angiograms, pacemaker insertion, MRI and functional tests seem to require a ward round decision and approval. It is promising that patients feel informed regarding these tests; however, in a ward where daily blood tests are performed, it was interesting to note that only 6–12% of patients were aware of this.

Figure 4.10: Patient understanding of tests or procedures they would be having



CT = computerised tomography; CTPA = computerised tomography pulmonary angiogram; DSE = dobutamine stress echocardiography; ESE = exercise stress echocardiography; EST = exercise stress test; MRI = magnetic resonance imaging; VQ scan = ventilation perfusion scan

4.6. Results for Objectives 4 and 5

Objective 4

Develop an intervention that assists cardiac doctors and nurses in making evidence-based clinical decisions by providing more opportunity for staff interaction and successful situational awareness to reduce patient care delays in and out of hours; the primary outcome, delays in the administration of cardiac medications, will indicate the impact of this intervention on team culture.

Objective 5

Deliver patient treatment plans specifically understood and accepted by the patient and all members of the cardiac streaming team, so that patient care is delivered sooner; staff and patients will be surveyed to measure their understanding about treatment plans.

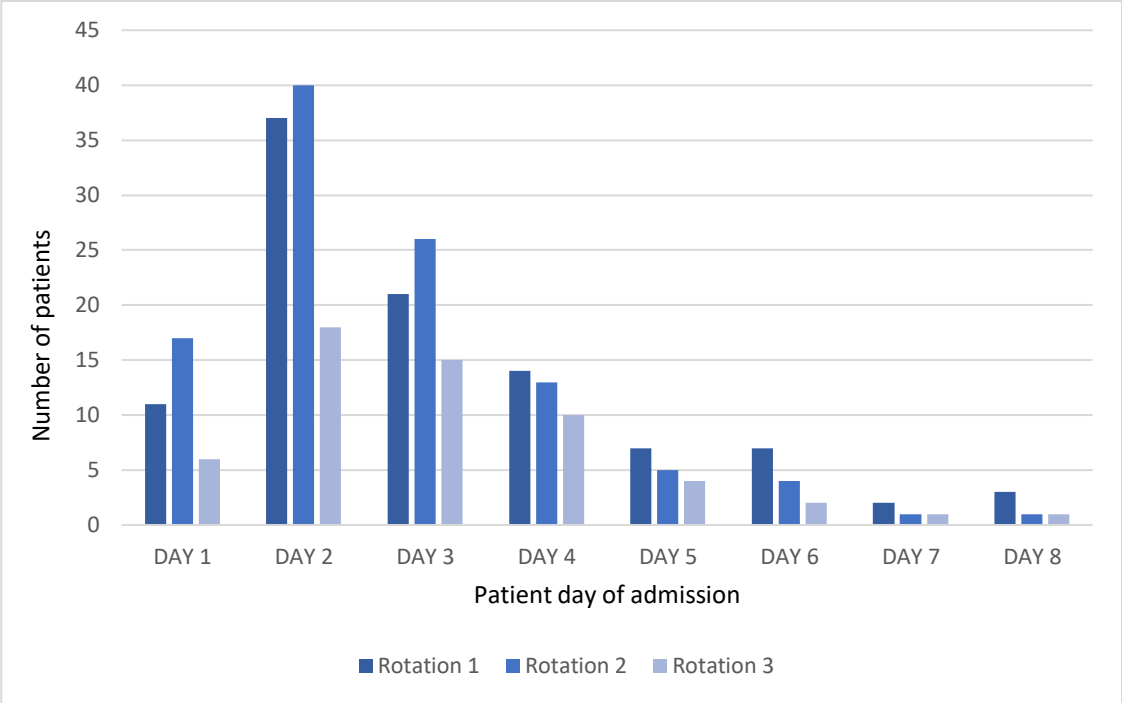
4.6.1. Challenges with compliance

Interpreting the results of this study cannot go without discussing the doctor and nurse compliance with the intervention.

The new ward round workflow introduced six structural elements as described in detail in Chapter 3. Each cardiac stream was asked to attend a daily morning ward round with a cardiologist before 11am, follow a routine, use a ward round proforma, and follow-up the ward round with post-ward round huddles later in the day. The most senior doctors, registrars and cardiologists, were also asked to return at the end of the day to update overnight treatment plans with the after-hours staff. This was not always achieved due to staffing, workload pressures, unavailability and simply an inability to fulfill all these new structural elements of the new ward round.

More patients were seen by a cardiologist and compliance rates were higher on the first ward round following admission to CCU (captured on day 2 or 3) than any other day of the patient's admission. This means that the cardiologist is more likely to see patients on the ward round in the early phase of their admission to hospital. Please note that patient recruitment stopped at day 7 and 8 for the last intervention cycle. See Figure 4.11.

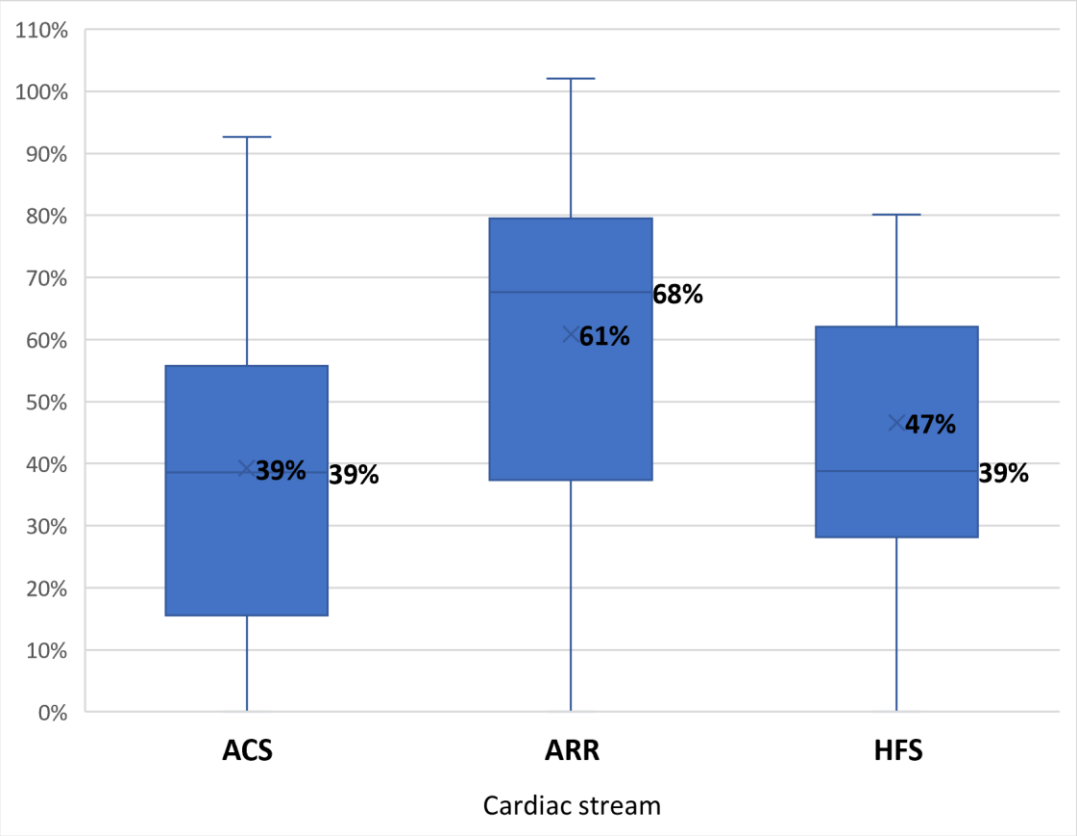
Figure 4.11: Day-to-day compliance in each intervention rotation: The number of patients seen by a cardiologist each day of their admission up to 8 days



The three streams varied in their ability to fulfill each of the six structural components of the new ward round. Average compliance rates were 39% for the ACS stream, 47% for the HFS stream and 61% for the ARR stream. Median scores were also 39% for the ACS and HFS streams, but the ARR stream stood out as the most compliant with a median score of 68%. See Figure 4.12. The blue lines dissecting the boxes in this figure indicate the median score.

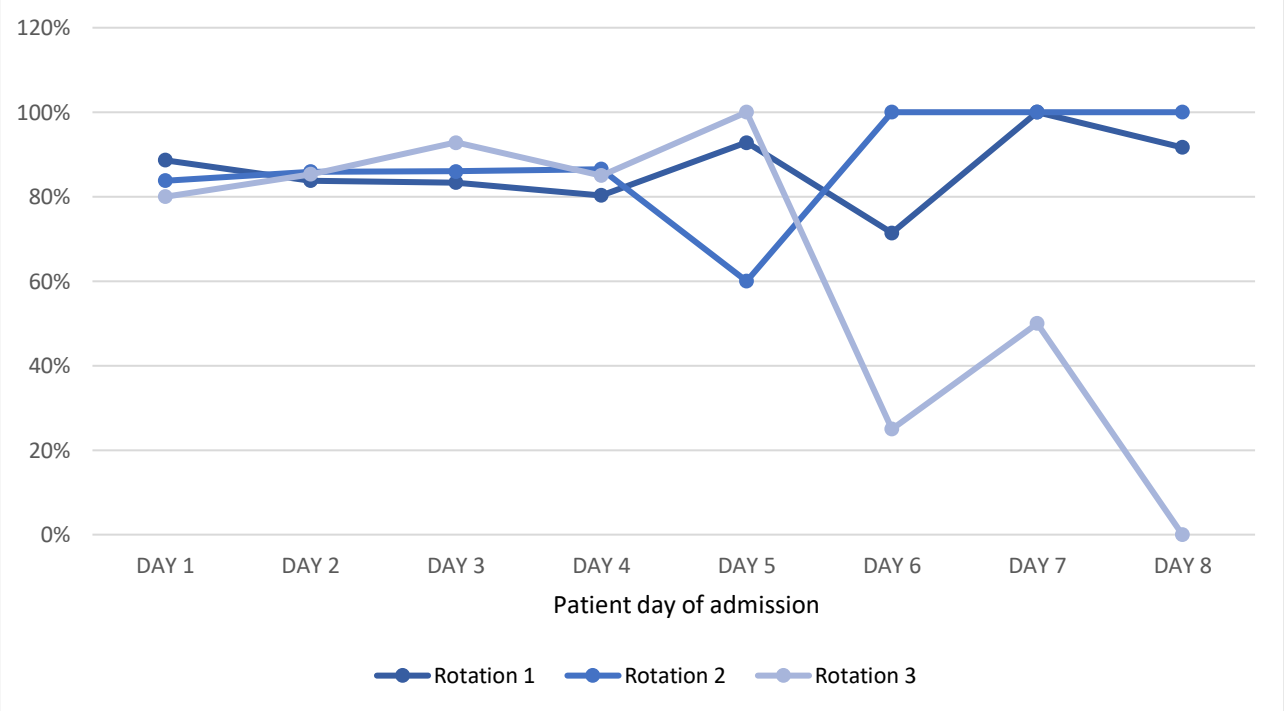
Figure 4.13 shows that cardiac nurse attendance on the ward round was high (80–100%) for the first 5 days of a patient's admission during the three intervention cycles, but did falter for the last cycle. This was due to unforeseen nursing sick leave that limited the availability of three nurses to attend the three streams during the last intervention cycle.

Figure 4.12: Compliance percentage of each stream with the new ward round structure (reported means and medians)



ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service
mean values displayed inside box and whisker graph, median values displayed outside box and whisker graph

Figure 4.13: Cardiac nurse ward round attendance



Each rotation reflects the 4-week cycle when the RMO changes cardiac streams. RMOs rotate through each of the three cardiac streams

4.6.2. Staff surveys

A total of 44 staff responded to the online staff survey: 23 responded to the pre-ward round study survey, and 21 responded to the post-study survey; however, not every question seemed to be answered. Staff did not respond to all of the questions. The link to the survey was emailed to approximately 20 doctors and placed on the nurses station computer desk top for approximately 35 CCU nurses who were asked to voluntarily complete them before the first study commenced and at the end of the first study. The survey is provided in Appendix 25. The first three questions were aimed at nursing staff and the rest for both doctors and nurses. The survey questions remained unchanged in the pre-study and post-study surveys. There was no way of knowing if responses were from a doctor or nurse. This anonymity fulfilled the ethics application criteria.

To determine when in the day nurses received updates on patient treatment plans, from the doctor they were asked if there were changes in their knowledge about investigations and drug orders by 10am, 12 midday and 6pm. Responses were not valuable as they were not that different in the before and after surveys, although there was a small indication that they received fewer updates after the intervention was completed. Confidence in decision making for doctors and nurses did show a positive change by the end of the intervention (net promoter scores: −26.32 to 0). See Figure 4.14.

Figure 4.14: Staff confidence in decision making before and after intervention: net promoter scores

Before ward round study

After ward round study

Response to question: How confident do you feel about contributing to clinical decision making on the CCU ward round?

Some respondents (25–30%) updated themselves following the ward round by approaching the shift coordinator and reading the patient's medical record. During the intervention, 7% more respondents found reading the ward round proforma as an option.

A majority of 14 respondents in both the before and after-study surveys, said yes to the question asking if they think that patients would benefit from a cardiologist review twice a day (see Table 4.4). 35 respondents out of the total 44 answered this question. Figure 4.15 shows the results for how long staff think it takes to gather information for the ward round. Most staff felt that gathering recent ECG's, blood tests and diagnostic results for the ward round took only 10 minutes before the ward round study. This opinion changed after the ward round study with most staff indicating information gathering took longer than 10 minutes. Table 4.5 show staff responses about what information staff feel is important to gather for the ward round. Staff indicated that a large amount of up-to-date data is required to assist in treatment plan decisions and is considered necessary to collect for the ward round, except for non -cardiac surgical history, arrival status and the presence of pressure areas.

Table 4-4: Staff opinion regarding a cardiologist reviewing patients twice a day

	Before ward round study		After ward round study	
Answer	**%**	**Count n=19**	**%**	**Count n=16**
Yes	73.68	14	87.50	14
No	15.79	3	0.00	0
Unsure	10.53	2	12.50	2

Figure 4.15: Time staff feel it takes to gather information for the ward round

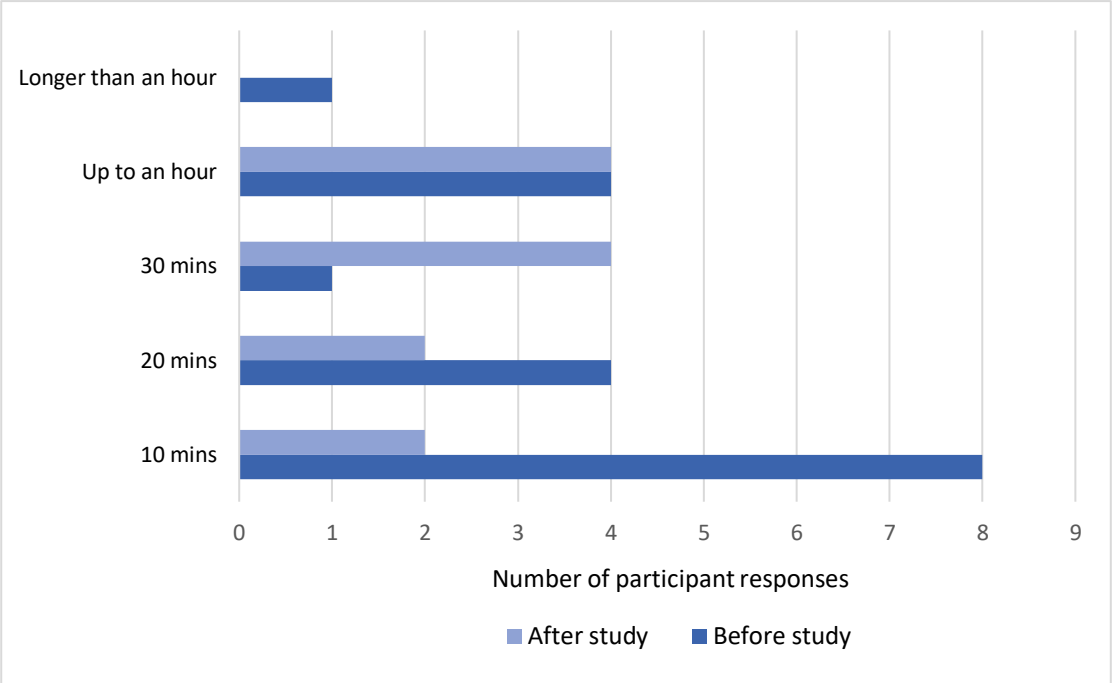


Table 4-5: Staff survey responses about which information needs to be gathered for the ward round

	Before ward round study		After ward round study	
Answer	**%**	**Count n=23**	**%**	**Count n=21**
Blood results	8.89	16	11.63	10
Arrival time	5.56	10	3.49	3
PMH of hysterectomy/appendicectomy	1.11	2	1.16	1
Echocardiogram results	7.78	14	9.30	8
MRO status	6.11	11	3.49	3
Allergies	8.33	15	5.81	5
Family history: mother had MI at age 70	6.11	11	5.81	5
Angiogram results	8.89	16	9.30	8
Arrival mode: ambulance or own car	3.89	7	3.49	3
Presence of pressure sore on admission	3.89	7	2.33	2
MRI results	7.22	13	5.81	5
Family history: brother had MI at age 49	7.22	13	6.98	6
Rhythm	7.22	13	9.30	8
ECG	10.00	18	12.79	11
Suspended medications (those drugs for review)	7.78	14	9.30	8
Total	100	180	100	86

ECG = electrocardiogram; MI = myocardial infarction; MRI = magnetic resonance imaging; MRO = multi-resistant organism; PMH = past medical history

Overall, results of the staff survey responses from our CCU doctors and nurses indicate a slight improvement about their confidence in decision making; their greater understanding that it takes more than 10 minutes to gather patient data for the ward round, mostly due to collecting ECG and blood test results; and their preference for cardiologists to review patients twice a day after the ward round study.

STUDY 2: WARD ROUND FOLLOW-UP STUDY

4.7. Results for Objective 6

Objective 6

Evaluate 1 year after the project to see whether a culture change has been sustained, by comparing primary and secondary endpoints at the two time points, as well as through staff interviews.

4.7.1. 1 year later

The same primary and secondary outcomes used in the initial ward round study were measured again 1 year after the intervention where there was still only one cardiac nurse available to attend all three cardiac ward rounds. Data for these patients was collected from the EMRs. The quantitative data for primary and secondary outcomes were then compared with data from the first ward round study (105 patients in the intervention group). Parametric tests were not used to measure statistical significance for the follow-up ward round study. It was simply a comparison to see whether results from the follow-up study matched those of the original ward round.

Staff interviews collected qualitative data that measured communication and collaboration between the CCU doctors and nurses. Attitudes, opinions and active engagement with the ward round were also collected. Innovative ideas and suggestions from staff provided helpful stakeholder information that could influence future ward round performance. The staff interview method used in the follow-up study provided the stakeholder engagement process and insight that was missing from the first ward round intervention. This information can feed into future ward round research.

This chapter will now present the data analysis to see how effective the ward round was 1 year following the first ward round study.

4.7.2. Participants

The patient population in the follow-up study comprised 114 patients with 115 episodes of care: 40 patients admitted to the ACS stream, 36 to the ARR stream and 38 to the HFS stream. This compared to almost 100 patients in each of the control and intervention groups for the first ward round study.

Data for patients in the follow-up study was collected for patients admitted between 3 April and 4 June 2022, within the same time period as the original ward round study. A total of 114 patients were admitted under the ACS, ARR and HFS streams at this time and received a ward round from their stream; as for the initial study, weekend ward rounds were not included.

4.7.3. Cohort characteristics

The variation in populations for the first ward round study and the follow-up study can be seen in Table 4.6.

The mean age of the patients in all cardiac streams in the follow-up study (68 [SD ±15] years) was the same as in the control group of the first study, and almost the same as the intervention period (65 [SD ±15] years).

Males still dominated the ACS stream; however, gender equality was more prevalent in the follow-up study, with 56% of patients being male in the follow-up study compared to 70% in the intervention group and 60% in the original control group.

Overall, the length of stay for the follow-up study, reported as a mean in Table 4.6, seemed shorter when comparing combined cardiac streams and the ACS stream. Further analysis using medians and interquartile ranges provided a better insight into this result. The combined streams and ACS stream report most patients staying for an average of 2.2 and 2.0 days, respectively, 1 year later, which is 12–16 hours shorter. Comparing distributed length of stay data in Table 4.8 shows median figures for ACS staying 4 hours shorter 1 year later and HFS median length of stay up to 12 hours longer, 1 year later. This result may have been impacted by the ambulance ramping and hospital bed access crisis that was occurring in South Australia, at the time of the follow up study, as well as the introduction of new European guidelines influencing future Australian guidelines that advocate for earlier patient discharge after myocardial infarction diagnosis (Collet et al., 2021). Another consideration was the increasing number of episodes of myocarditis and pericarditis during this time. These patients, admitted to the ACS stream, seemed to get home sooner. The median length of stay for patients in the HFS stream was slightly longer in the follow-up study, meaning most patients in this cohort stayed in hospital for 12 hours longer. Either way, we cannot determine if the restructured ward round had any influence on length of stay.

Readmission rates seemed higher during the intervention with 9 less patients being readmitted more than once in the 30-day post-discharge period 1 year later. However, the ACS stream

showed a drop in patient numbers compared to the initial study, as only one patient was readmitted after 30 days for that cohort in the follow-up study. This may be explained by the inflammatory cardiac diagnoses that patients were experiencing at that time due to COVID. ARR and HFS patients displayed readmission rates almost half of those during the ward round intervention.

We can conclude that 1 year later there was a more even gender distribution and similar ages among patients, and a slight change to time spent in hospital and readmission rates; however, we cannot conclude that this was influenced by the lack of cardiac nurses dedicated to each cardiac stream ward round.

Table 4-6: Comparison of patient populations in Study 1 and Study 2

Variable	Control n=99	Intervention n=98	*p value Study 1	Follow-up study n=114
Population (count)				
All streams	99	98		114
ACS	54	59		40
ARR	22	19		36
HFS	23	20		38
Episodes of care (count)				
All streams	101	105		115
ACS	54	59		40
ARR	22	19		36
HFS	25	27		39
Age (years), mean (SD)				
All streams	68.1 (±13.7)	64.9 (±14.7)		68.0 (±15.6)
ACS	66.2 (±11.7)	64.2 (±12.4)		66.3 (±15.5)
ARR	67.0 (±16.9)	71.6 (±14.8)		71.6 (±12.8)
HFS	73.5 (±13.7)	62.5 (±19.5)		66.5 (±17.6)
Gender, male (%)				
All streams	60	70		56
ACS	52	73		65
ARR	73	70		53
HFS	65	67		51
Length of stay (days), mean (SD)				
All streams	5.7 (±11.7)	4.5 (±4.6)	p=0.546	3.9 (±4.7)
ACS	6.3 (±13.5)	4.9 (±5.0)	p=0.398	2.2 (±1.4)
ARR	2.0 (±1.3)	2.2 (±2.1)	p=0.786	2.4 (±1.7)
HFS	7.6 (±12.4)	5.5 (±4.4)	p=0.604	7.1 (±6.7)
Readmission rates (admissions events: patient number)				
All streams	12:11	39:20	p=0.063	11: 11
ACS	10:9	15:11	p=0.436	1:1
ARR	1:1	6:4	p=0.089	3:3
HFS	1:1	19:6	p=0.215	7:7

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service; SD = standard deviation
** p value significance = 0.05*

4.8. Outcome data and main results

4.8.1. Primary outcome: Cardiac medication delays

The EMR system was fully activated in July 2021, so staff were no longer using paper records at the time of the follow-up study. This made the interpretation of cardiac medication delays different to the original ward round study. When doctors were delaying a drug dose, the only EMR signal to nursing staff was for doctors to cancel or suspend the drug. Suspending a drug shows up on the eMar as a stop hand symbol, indicating to the nurse that the scheduled dose is not to be given. The eMar showed when doses were administered, suspended, withheld and restarted. Disturbingly, we noticed a user order error that prolonged scheduled administering times. When doctors started a drug after 0800hrs, on the ward round, they were not recording a morning dose in the eMar. This meant the drug was only scheduled to be administered for the next dose, being 2000hrs for a twice-a-day dose or the next morning at 0800hrs for a daily dose. This showed up as a 12-hour or 24-hour delay. Medical and nursing notes were read to ensure this was not a deliberate action, and these instances were not counted as delays if properly documented to commence that night or the next morning. This user error was raised with senior medical and nursing staff to ensure we were not continuing this poor practice at the time of data collection in 2023.

As with the first ward round study, the data was skewed and not evenly distributed. As we were using a null hypothesis, we were not expecting to see an improvement in timely patient care. The objective was to see if we could sustain a culture that promoted effective decision making. We were not seeking statistical significance. Therefore, a non-parametric test was not used for this comparison follow-up study. The results for cardiac medication delays 1 year later did not match the intervention period for all streams combined (intervention: median 0 hr/med [IQR 0–0.5] versus 1 year later 0.11 hr/med [IQR 0–1.87]). See Table 4.7. Most patients did not experience a delay during the intervention, except for the ARR stream, whereas 1 year later, most stream patients had a cardiac medication delay of at least 5–13 minutes, with some patients experiencing 1- to 3-hour delays, longer than during the intervention. Figure 4.16 illustrates this comparison. The figure shows that the HFS stream benefited the most from the ward round intervention by the small box between the HFS control and HFS follow up box and whisker. Shorter cardiac medication delays had not been maintained a year after the intervention for the HFS and combined ACS and ARR streams when comparing the height of the intervention and follow up boxes. This could have been influenced by different prescribing methods, paper versus electronic records, and/or simply

that structured ward round practices were not retained a year after the intervention, especially with the lack of cardiac nurses attending the ward round.

Nurses were not rostered for each of the three cardiac stream ward rounds following the intervention. This meant that going back to the routine practice where the one nurse coordinator is the only cardiac-trained nurse available to attend all three ward rounds has not benefited cardiac medication administration delays. However, due to the prescribers not factoring in “catch-up” doses, patients seemed to have less interrupted sleep as they did not have cardiac medications scheduled after 2000hrs on the eMar.

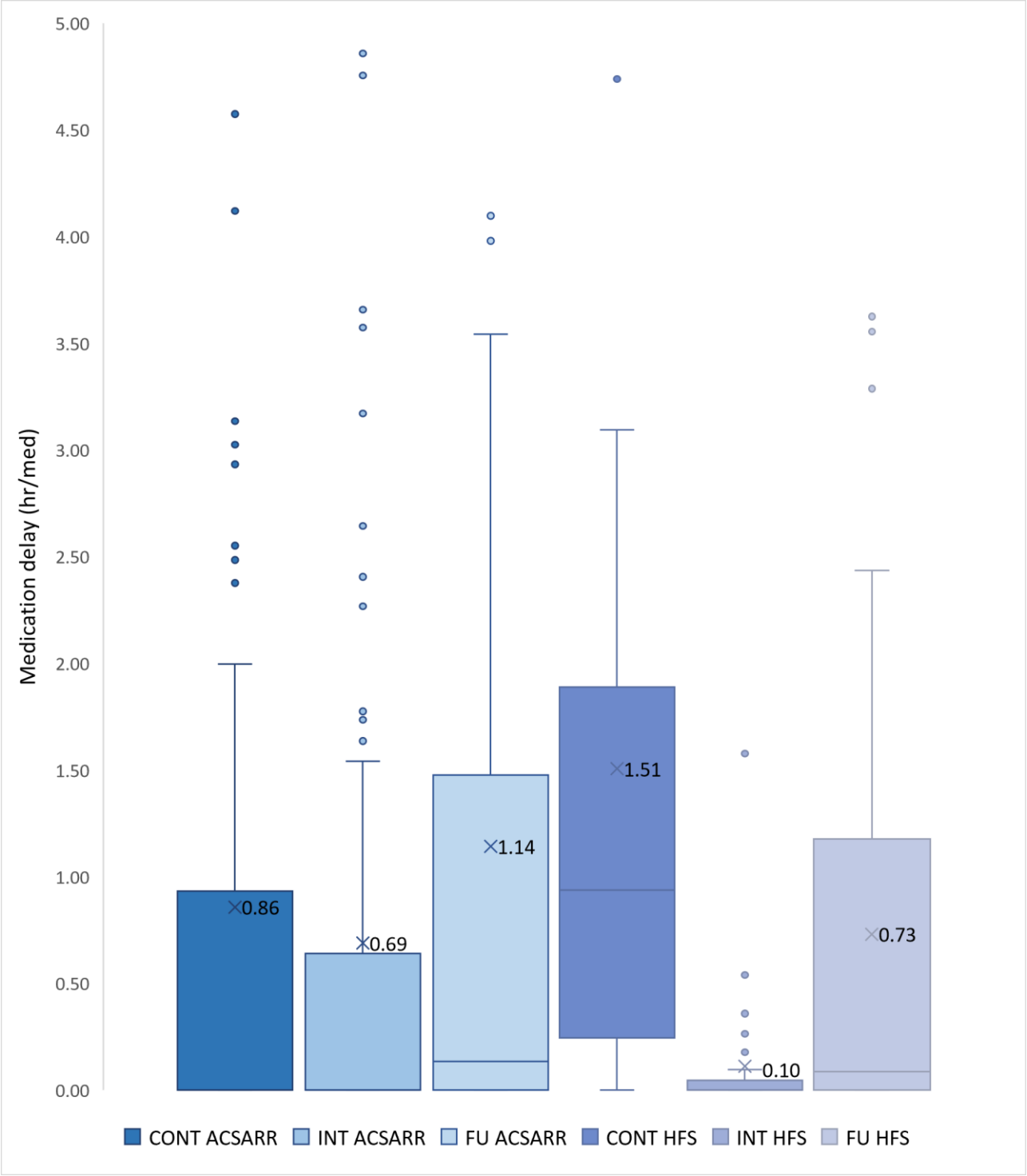
Table 4-7: Primary endpoint: cardiac medication delays (Kruskal–Wallis/Chi^2 with ties), plus 1 year later comparative figures without non-parametric tests

	Control n=101		Intervention n=105			1 year later n=115	
Variable	**Median delay (IQR) (hr/med)**	**Mean**	**Median delay (IQR) (hr/med)**	**Mean**	**p value***	**Median delay (IQR) (hr/med)**	**Mean**
All streams	0.23 (0–1.21)	1.02	0 (0–0.52)	0.54	0.012	0.11 (0–1.87)	1.01
ACS stream	0 (0–0.40)	0.59	0 (0–0.65)	0.63	0.44	0.14 (0–1.42)	0.84
ARR stream	0.67 (0–2.38)	1.53	0.85 (0–0.85)	0.92	0.19	0.21 (0–2.42)	1.48
HFS stream	0.94 (0.25–1.58)	1.51	0 (0–0.03)	0.10	**<0.001**	0.09 (0–1.05)	0.73

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service; hr/med = hours per medication; IQR = interquartile range

** p value significance = 0.05 comparing control to intervention. Follow-up study (1 year later) did not seek statistical differences between variables, only comparison to measure sustained effect. Values for follow-up study calculated in Microsoft Excel.*

Figure 4.16: Comparison of cardiac medication delays in Studies 1 and 2: ACS and ARR combined versus HFS



Legend

CONT ACSARR	Control: acute coronary syndrome and arrhythmia streams
CONT HFS	Control: heart failure service stream
INT ACSARR	Intervention: acute coronary syndrome and arrhythmia streams
INT HFS	Intervention: heart failure service stream
FU ACSARR	Follow-up: acute coronary syndrome and arrhythmia streams
FU HFS	Follow-up: heart failure service stream

Mean values displayed on box and whisker graph

4.8.2. Secondary outcomes

Secondary outcomes for length of stay, booking delays, fasting times and IDC insertion times were again reported as medians with interquartile ranges, except for IDC insertion times which are reported only as means. See Table 4.8.

Overall, there were no clinical differences in secondary outcomes when measured 1 year after the ward round study, although averages for length of stay and booking delays seem shorter. See Table 4.8. In the follow-up study, EMRs made it easier to capture the time a test was ordered, particularly echocardiography and chest x-rays. Medical staff often activated orders for these investigations immediately on a patient's admission and on the ward round. They were rarely missed for all the cardiac streams. Therefore, most booking delays reported a median of 0 as there were only a few patients that had a reported booking delay. Very few patients had an IDC's inserted; 6 in the control group, 7 in the intervention group and 8 in the follow-up study. It was therefore not certain from the data whether there was any effect from the intervention, let alone any changes 1 year later.

The other key clinical activities – lengthy bed rest, oxygen administration, patient education including cardiac rehabilitation, driving and discharge instructions – were also reported as percentages. See Table 4.9. EMR medical discharge letters were based on a template for most patients, so a statement stating the patient had been educated was populated automatically in the letter. The letters stated that driving instructions and patient discharge education was provided to each patient. This improved documentation may have resulted in the larger percentage of patients being reported as receiving discharge advice 1 year later, therefore, the only clinical activity that showed a clinical difference, although not many doctors were observed to be providing bedside discharge education to their patients. Doctors were more likely to be seen in the doctor's office writing discharge letters.

Nursing notes that mentioned patient mobility, discharge education and receipt of cardiac rehabilitation packs were captured during data collection, as well as notes written by the specialist heart failure nurses to determine whether patients received discharge education and remained in bed for longer than 24 hours (see Table 4.9). This was not in a template or flowsheet form and nurses would specify which type of education was provided to an individual patient in the progress note. Many heart failure specialist nurses came to see their patients as well, thus improving the score for provision of discharge advice in the HFS stream from 21% to 53% 1 year later. Heart

failure nurses, however, were not seen on the ward round but received a consult order from doctors and nurses via the patient's EMR. One could speculate that EMRs improved the referral process rather than relying on the previous method of phone referrals.

In summary, secondary outcomes measured 1 year later seemed to show improvement for length of stay and the provision of patient discharge advice, whereas it is difficult to see obvious sustained changes to other variables. This is likely to be influenced by external factors to the ward round, such as use of EMR, bed demands during COVID and ambulance ramping leading to early patient discharge as well as the absence of ward round structures that promote nurses attending the ward round during the follow up study period.

Table 4-8: Secondary endpoints: time comparison 1 year later

	Control n=101		Intervention n=105		1 year later n=115	
Variable	**Mean**	**Median percentile (IQR)**	**Mean**	**Median percentile (IQR)**	**Mean**	**Median percentile (IQR)**
Length of stay (days)						
All streams	5.66	2.68 (0.54–5.17)	4.54	2.70 (0.54–5.04)	3.91	2.23 (0.32–4.23)
ACS	6.27	2.50 (0.42–4.0)	4.87	2.70 (0.62–5.04)	2.22	2.03 (0.53–2.48)
ARR	1.96	1.68 (0.62–2.12)	2.10	1.74 (0.62–2.54)	2.36	1.79 (0.43–3.29)
HFS	7.61	4.52 (1.37–7.83)	5.46	4.33 (0.46–7.83)	7.06	4.79 (0.32–8.98)
Booking delays (hours)						
All streams	16.60	2.5 (0–19)	8.83	1.0 (0–11	1.84	0
ACS	21.52	3.75 (0–29.75)	8.94	2.0 (0–12.0)	0.43	0
ARR	8.70	1.5 (0–10.0)	8.61	0 (0–12.08)	1.42	0
HFS	12.84	2.0 (0–16.0)	8.28	0.125 (0–5.0)	3.69	0
Fasting times (accumulated hours)						
All streams	11.02	9.0 (0–17.0)	9.15	7.0 (0–14.72)	8.57	6.0 (0–14.0)
ACS	12.66	10.5 (0–16.0)	11.18	9.5 (0–16.5)	7.63	6.0 (0–15.0)
ARR	11.13	6.75 (0–14.72)	10.33	11.0 (0–14.5)	10.28	12.0 (0–15.0)
HFS	7.41	0 (0–17.0)	24.35	0 (0–10.0)	7.76	0 (0–12.0)
IDC insertion times (hours)						
All streams	2.77		2.23		3.71	
ACS	3.45		2.90		0.74	
ARR	0		0		1.33	
HFS	6.0		**2.14**		4.9	

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service; IQR = interquartile range

Table 4-9: Secondary endpoints: comparison 1 year later, percentages

Variable	Control n=101	Intervention n=105	1 year later n=115
Bed rest >24 hours,			
All streams	35	26	24
ACS	36	27	28
ARR,	36	42	**22**
HFS	32	**11**	24
Oxygen use,			
All streams	21	19	26
ACS	5	17	18
ARR	50	**11**	17
HFS	28	32	45
Driving instructions,			
All streams	23	26	18
ACS	23	**40**	**35**
ARR	27	17	17
HFS	16	4	3
Cardiac rehabilitation,			
All streams	32	36	*
ACS	36	**59**	23
ARR	14	6	*
HFS	40	11	*
Discharge advice,			
All streams	24	24	**43**
ACS	20	22	**40**
ARR	27	33	**39**
HFS	28	21	**53**

ACS = acute coronary syndrome; ARR = arrhythmia; HFS = heart failure service

**Cardiac rehab only calculated for ACS patients receiving referral to cardiac rehabilitation services and heart foundation information packs.*

***Bold** numbers highlight increased or decreased prevalence in secondary endpoint percentages*

4.9. Staff interviews

Staff were interviewed during their rostered hours over a 2-week period at the end of February 2023. The primary investigator also observed CCU activity and ward round attendance during this time. Thirteen staff interviews were captured – seven doctors and six nurses – ranging from senior clinicians to those with less cardiology experience for both interview groups.

Results from staff interviews are set out in two parts. The first part of this analysis captures the quantitative responses to the multiple-choice questions, ward round attendance, and the surface or clear (semantic) view of what was said in responses to each question. This was matched with what was observed at that time. The second part of our results uses the thematic analysis framework derived from the NVivo data, to analyse the attitudes and behaviours that contribute to a workplace culture that strives for excellence. An inductive approach was used, meaning themes were derived from the participants' responses (Braun & Clarke, 2021; Clarke & Braun, 2017; Smith, 2015).

4.9.1. Part one: Participant responses

Coding

The primary investigator used NVivo software to create 15major codes according to participant responses to each question, including subcategories (minor codes) within most of the codes. Table 4.10 displays the codes and response rates. Refer to Appendix 27 for the coding book.

Opinions regarding ward round attendance were separated for cardiologist and nurse attendance, as these are the two groups that do not always attend an entire ward round. Coding then divided comments by doctors, nurses and the more experienced members of the team to further define responses about regular or intermittent ward round attendance.

Table 4-10: Codes extracted from staff interview responses, with number of files and references for each from NVivo

Major codes	Minor codes		Files	References
Attendance		Attended all ward rounds	5	5
		Attended some ward rounds	2	2
	Cardiologist attends partial ward round		10	19
		Doctor opinion	7	15
		Nurse opinion	3	4
		Senior doctor and nurse opinion	6	10
	Cardiologist attends the whole ward round		11	19
		Doctor opinion	6	10
		Nurse opinion	5	9
		Senior doctor and nurse opinion	7	11
	Nurse attends a partial ward round		10	19
	Nurse attends the whole ward round		4	4
		Doctors want nurses on the ward round	5	13
		Nurses want to be on the ward round	4	15
	Nurses did not attend any ward rounds		1	1
Streams complete ward round before leaving CCU			6	8
		Doctor opinion	3	4
		Nurse opinion	3	4
		Value nurses on the ward round	5	12
		Ward round streams leave the ward round incomplete	7	12
Checklist use			8	14
Communication		Doctors seek nurses	8	25
		Doctors do not seek nurses	6	9
		Nurses do not seek doctors	1	1

Major codes	Minor codes		Files	References
		Nurses need to seek doctors	6	6
Concerned comments			12	83
		Doctor concerns	7	47
		Nurse concerns	6	36
Culture and teamwork		Belonging	1	2
		Do not feel as though they belong on the ward round	2	3
		Do not feel valued	2	5
		Do not feel respected	2	4
		Respected	9	19
Education			1	2
		Ward round is a learning environment	3	5
Empowerment			13	75
Expertise			11	41
		Intern viewpoint	1	2
		Junior nurse viewpoint	3	5
		Senior expertise	7	28
Off the ward round		Board rounds	2	5
		Huddles	13	35
		Update at the end of the day	13	35
Positive comments			13	125
		Nurse positive comments	6	45
		Doctor positive comments	7	80
Quality			12	34
Safety			9	23
Trust			8	18
Ward round role description	Doctor's role	All members of the ward round team understand the treatment plan	2	3
		Assist with decision making	1	1

Major codes	Minor codes	Files	References
	Communicate to other specialties	1	1
	Documentation of the ward round discussion	3	3
	Examining the patient	2	3
	Lead the ward round structure	1	3
	Patients understand the treatment plan	2	2
	Provide junior doctors with instructions	2	2
	See all the patients on the ward	2	2
	See only new patients	1	1
	Supervisor role	5	6
	Ultimate responsibility	3	3
	Write orders for drugs and tests etc.	3	4
Nurse's role	Communicate patient issues and clinical concerns	4	7
	Conduit to ensure timely delivery of care to the patient	2	4
	Follow doctors around	1	1
	Listen to ward round conversation	1	1
	Needs to be a part of the ward round team	2	4
	Provide instructions to bedside nurses	1	1
	Provide nursing information to the ward round stream	5	6
	Wait to be asked for nursing input	1	1

Major and minor codes extracted from interview conversations. Files and references indicate the numbers of participants and number of comments, respectively, for each of the major and minor codes.

Communication was coded into comments regarding doctors and nurses ensuring they communicate with each other about the treatment plan, inside and outside of the ward round. Positive and negative sentiments were extracted from the codes to create codes for concerned comments and positive comments, divided between doctors and nurses. The education code was created to capture comments that related to learning while on the ward round.

All participants mentioned how comfortable or uncomfortable they were speaking up within the team and their acceptance of those that do speak up, on and off the ward round. This was coded as empowerment, capturing a culture where participants feel empowered and participants empower others to discuss clinical issues that affect patient care, even if it is to find out why a treatment, test or drug has been ordered. Another code, culture and teamwork, divided comments about how much participants felt they belonged, and were respected and valued as a ward round team member.

Responses to questions regarding communication off the ward round were coded into ward rounds, huddles and updates at the end of the day. These codes captured comments made about discussions at the nurses' station, paper rounds and phone calls. Even though no formal ward round roles were outlined, each participant expressed their own opinion about what they were meant to do on the ward round. The codes extracted from participant responses were used to create themes for the thematic analysis. The results chapter discusses the formulation of themes in more detail.

Demographics

Table 4.11 shows the breakdown of the 13 interview participants and their experience according to time working in cardiology and CCU. The doctors included registrars (also called advanced trainees) and cardiologists (also called consultants). Cardiac nurses who coordinated the shift were sometimes referred to as the team leader by the medical staff.

Table 4-11: Participants' cardiology and CCU experience

Participant	>10 years cardiology & CCU experience, n=5	<1 year cardiology & CCU experience, n=8
Doctor and stream, n=7	2 x consultants: ARR + HFS	2 x 1st year registrars: ACS + HFS 1 x RMO: ARR 2 x interns: HFS + ACS
Nurse, n=6	3 x senior cardiac-trained RNs	3 x RNs (started coordinating this year)

ACS = acute coronary syndrome; ARR = arrhythmia; CCU = cardiac care unit; HFS = heart failure service; RMO = resident medical officer; RN = registered nurse; Senior cardiac-trained RN = a registered nurse with >5 years experience holding a graduate diploma in cardiac nursing

Ward round role description

Participants' descriptions of their perceived role on the ward round are presented in Table 4.12. Registrars felt they were the ward round leaders and cardiologists tended to agree. The cardiologist would see the patients that the registrar asked them to see but did not necessarily see all the CCU patients. Some cardiologists, but not all, were also observed doing a board round.

RMOs and interns saw themselves as scribes. They felt their role is to act on orders that came out of the treatment plan and to communicate these orders to other healthcare professionals. Nurses felt it is their role to raise patient care issues with the doctors, but the less-experienced nurses did not necessarily speak up unless asked. The primary investigator witnessed nurses who were quiet and did not actively engage in the bedside discussion. The more experienced cardiac nurses were seen to be more vocal.

It is interesting to note that no-one took responsibility for introducing the ward round team to the patient, although it was observed that the cardiologist or the registrar often took on this role. One intern mentioned that they sometimes perform the physical examination of the patient. It was observed that the cardiologist would step back and allow the registrar to do this unless they instigated the examination themselves. The registrar would sometimes allocate the physical examination to the RMO or intern.

Table 4-12: Participant descriptions of their ward round role: collated themes extracted from interview responses

Participant	Responses
Doctors	
Cardiologist	Supervision Ultimate responsibility Team agreement on the patient treatment plan
Registrar	Taking the consultant to see all new and sick patients Leading the ward round Providing instructions to the junior doctors Ensuring a clear management plan exists
Resident medical officer	Documentation Ordering medications, tests etc. according to the treatment plan
Intern	Note taking. Prescribing drugs Sometimes examining the patient Communicating with other specialities, ward and allied health staff
Nurses	
Senior cardiac nurse	Following the doctors on ward round Providing nursing information Communicating patient issues and clinical concerns with doctors Multitasking with nurse unit manager, ward clerk, bed manager and pharmacists Listening to what is said on ward rounds as it is not always documented. Giving bedside nurse instructions
Registered nurse with <1 year as coordinator	Communicating patient issues and clinical concerns with doctors Acting as conduit for information about changes in treatment and therapy to ensure timely delivery of care Being a part of the ward round team Listening and giving nursing input when asked

Ward round attendance and structure

Registrars, RMOs and interns routinely saw all CCU patients on the ward round daily; however, cardiologists and nurses did not. See Table 4.13. Cardiologists did not necessarily feel they needed to see all patients every day, as they must give the registrars room to learn and apply their clinical knowledge. However, cardiologists did make themselves available to the registrar to discuss any clinical concerns the registrar may have. A heart failure cardiologist saw all the patients on a Monday and Thursday ward round. This cardiologist would undertake a full board or paper round

if they had not seen all the patients on a particular day. Another cardiologist, who attended the entire ward round on two days in the week, felt that the registrar needed time to build their clinical skills without a cardiologist always present, so stepped back on the other three days. Interestingly, two senior cardiac nurses and some of the junior doctors felt that the cardiologist should stay and see all their patients. See Table 4.14. This was because they felt the cardiologist is responsible for their patients, and some thought that clinical decisions were made sooner when the cardiologist was present on the ward round. It was common to see the ACS cardiologist rush in and do a quick ward round of the new patients as they have to leave to perform cardiac procedures in the cardiac catheterisation laboratory (cath lab). HFS and ARR stream cardiologists were observed to leave the ward to attend outpatient clinics, including seeing patients under their care in other private hospitals.

Nurse coordinators were often observed to be multitasking and could not always attend a full ward round, let alone all three cardiac streams. Interestingly, they did not ask patient care nurses or the clinical support nurse to attend the ward round either. Observation of the ward round showed that nurse coordinators prioritised patient care over ward round attendance, as well as the coordinator watching the central cardiac monitors, answering phone calls and communicating with bed management and other administrative tasks. Observation and interview responses also indicated that the nurse coordinator prioritised the ACS stream ward round and attended partial HFS and ARR stream ward rounds.

Both doctors and nurses agreed that nurses belong on the ward round. A cardiologist and a junior RN did state that nurses should only attend sometimes. This was due to the increased amount of administrative work nurse coordinators are required to do and being unable to leave the central monitors and phones, as sometimes there is not a cardiac nurse available to relieve the nurse coordinator at the nurses' station. (A cardiac nurse who can interpret lethal arrhythmias must always watch the central cardiac monitor at the nurses station and answer the phone, including the bed manager phone.) One senior RN did state that they would rather see the clinical support RN working with the junior RNs to ensure safe patient care rather than relieving them at the nurses' station. Again, the priority was towards patient care rather than the ward round. Nurse coordinator relied on the doctors to come back and discuss the ward round decisions with them at the nurses' station.

Ward round teams often saw some of their patients then left the CCU to review other patients around the hospital. Interview participants had mixed levels of agreement with this process. Most nurses felt that the ward round team should stay on the unit to finish the ward round, but they also recognised the importance of clinical priority for sick patients in the emergency department, intensive care unit (ICU) or another ward. This was the main reason that the ward round was broken into stages, as the cardiologist was only seeing the new and sickest patients throughout the hospital. Cardiac nurses were happy to wait for them to return. In reality though, when the teams did return to the CCU, they were often observed to be recommencing the ward round without informing the nurse coordinator that they were doing so. Two or three cardiac teams coming and going from the unit did seem to make it harder for the nurse coordinators to keep up with the ward rounds.

Finally, participants were asked whether they used a checklist of some form. Most of them used the handover sheet and made their own checklists to ensure they had all the relevant patient information to share with the ward round and then to note the actions required during and following the ward round. A formal ward round checklist does not exist, and the first ward round study did show poor compliance when one was made available. Doctors and nurses seem to prefer making their own mental notes and highlighting checklist items they feel are important on the day.

Table 4-13: CCU ward round attendance by interview participants

Participant	Ward round attendance this week (5 days)	Nurse seen on ward round	Cardiologist did attend entire CCU ward round	Allocated another nurse to attend ward round
Doctors				
Cardiologist	40–100% (did not routinely see all patients)	50–60%	"Twice a week"	
Registrar	100%	0–60%	40%	
Resident medical officer	100%	30% (patient care nurse only)	30%	
Intern	100%	25–60%	25–30%	
Nurses				
Senior cardiac nurse	1 to 2 (mostly ACS stream)			No
Registered nurse with <1 year as coordinator	2 out of 2 (mostly ACS stream) Sometimes partial ARR and HFS streams			No

ACS = acute coronary syndrome; ARR = arrhythmia; CCU = cardiac care unit; HFS = heart failure service

Table 4-14: Staff opinions about ward round attendance

Participant	A nurse should attend the ward round	Teams should see all CCU patients before leaving CCU	The cardiologist should attend the entire ward round	Do you use a checklist?
Doctors				
Cardiologist	Agree x 1 Sometimes x 1	Somewhat agree x 2	Disagree x 2	Yes x 1 (mental one) No x 1
Registrar	Agree x 2	Disagree x 1 Somewhat agree x 1	Disagree x 1 Somewhat agree x 1	Yes x 1 No x 1
Resident medical officer	Agree x 1	Somewhat agree x 1	Slightly agree x 1	Yes x 1
Intern	Agree x 2	Agree x 1 Somewhat agree x 1	Somewhat agree x 1 Disagree x 1	Yes x 1 No x 1
Nurses				
Senior cardiac nurse	Always x 3	Always x 3	Always x 2 Somewhat agree x 1	Yes x 3
Registered nurse with <1 year as coordinator	Always x 2 Sometimes x 1	Always x 1 Somewhat agree x 1 Disagree x 1	Always x 3	Yes x 2 No x 1

CCU = cardiac care unit

Communication and collaboration

Participants were asked about their communication and collaboration strategies outside of the ward round. Most of the nurses felt they were frequently seeking doctors to speak with them about patient deterioration and understanding the treatment plan. They felt it was more common for them to ask the doctors than depend on the doctors coming to them. However, the RMOs did make more of an attempt to update the nurses, especially at the end of the day before they went home. Nurses felt they struggled to have an updated treatment plan at the end of the day which would help with overnight care of unstable patients. They did appreciate those doctors that did try to update them, but this was not as common as they would like.

The registrars thought it was important to keep the nurses informed, if not in person then at least by phone, so that both doctors and nurses were "on the same page" with clinical information about unstable patients. A cardiologist reflected that nothing would get done if nurses did not know about the orders and decisions made on the ward round. Doctors also recognised that nurses could flag important issues, such as blood results and arrhythmias, that had not been seen by the doctors. The doctors stated that delays in discharge planning could be circumnavigated when doctors and nurses join in with the paper round in the doctor's office, but there was a differing opinion when it came to the discussion before the doctors went home.

Cardiologists and registrars agreed that it should be the registrar who clarifies plans for unstable patients with the nurses at the end of the day. Not all registrars were seen doing this though. One doctor commented that the burden is often left for the night doctors and nurses to figure out the plan, especially when relying on notes only.

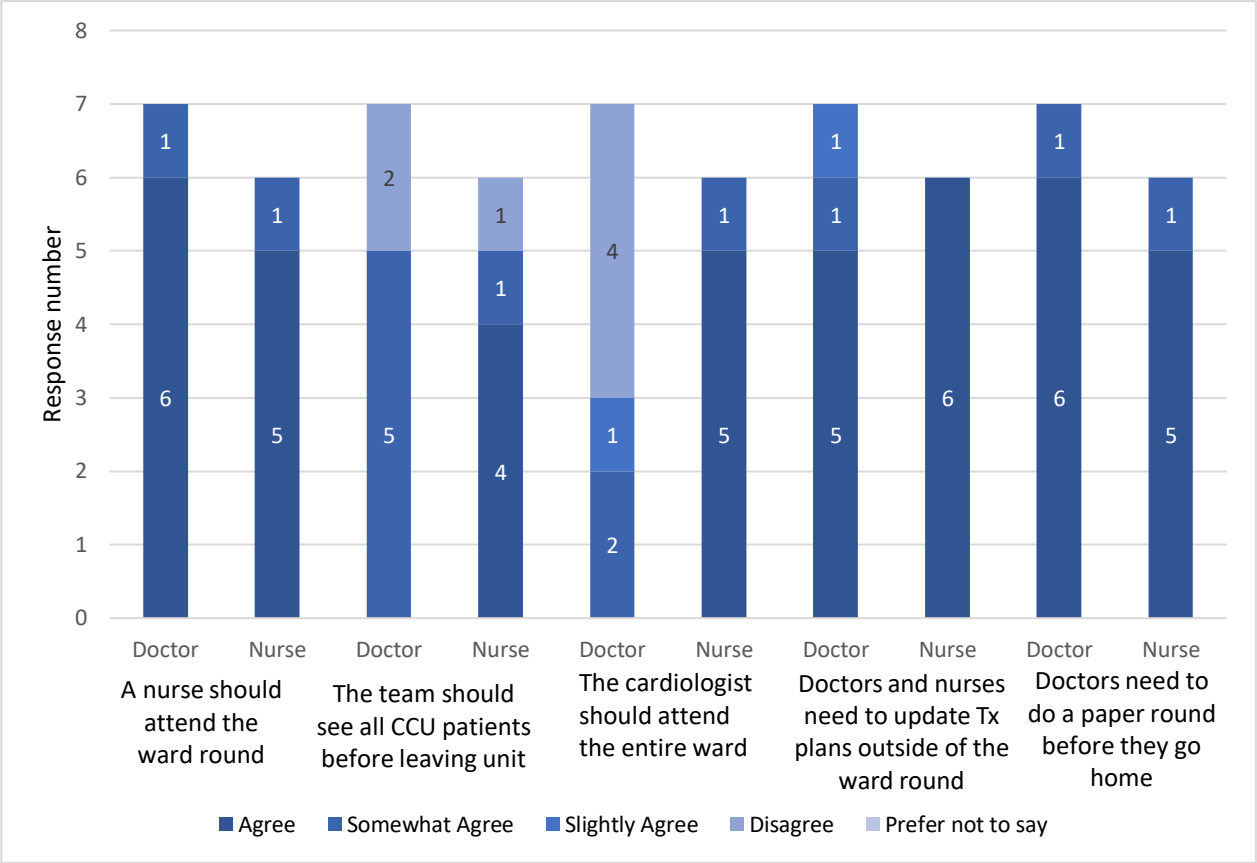
More than one participant commented on the accuracy of note taking on the ward round. The doctors felt that their documentation was not always accurate. Verbal updates were required as the plans changed throughout the day. This meant that nurses could not always rely on the medical notes, unfortunately creating mistrust in the communication process. See Table 4.15 and Figure 4.17.

Table 4-15: Staff opinions about communication and collaboration

Participant	Doctors and nurses need to update treatment plans outside of the ward round	Did the doctor speak with a nurse outside of the ward round? How many times?	Doctors need to do a paper round with the nurse coordinator before they go home	How many times did this occur and by who?
Doctors				
Cardiologist	Somewhat agree x 1 Slightly agree x 1	Role of registrar and RMO to do that I do that if the nurse has not been on the ward round	Agree x 1 Somewhat agree x 1	No, it's the registrar's role
Registrar	Agree x 2	At least 4 times a day Once or twice	Agree x 2	At the end of my shift if on call Twice this week
Resident medical officer	Agree x 1	Nurses often approach me and remind me	Agree x 1	Once or twice but not at the end of the day
Intern	Agree x 2	At least once a day, 2 to 3 times on other days	Agree x 2	Too many to count during the day Not before I went home
Nurses				
Senior cardiac nurse	Agree x 3	Too busy running the shift and patient care; prefer doctors to come to me. Too many to count, mostly patient deterioration parameters Only if plans are not clearly documented	Agree x 3	Occasional registrar
Registered nurse with <1 year as coordinator	Agree x 3	Yes, only about particular patients I tell the registrars to come to me if I cannot go on the ward round Lost count	Agree x 2 Somewhat agree x 1	Doesn't always happen Some are better than others, mostly an RMO 4 or 5 times One person from all teams

RMO = resident medical officer

Figure 4.17: Collated results of staff opinions on attendance and communication



CCU = cardiac care unit; Tx = treatment

Situational awareness

Table 4.16 shows the results for communication behaviour at and away from the bedside. Overall, the cardiac doctors from all levels appreciated the cardiac nurses' input and insight into patient treatment plans. They respected CCU nurses' knowledge and felt they had a more thorough understanding of the medication chart, so appreciated being reminded about withholding or recommencing medications. Doctors were happy when nurses advocated for their patients, both at and away from the patient bedside. The more experienced nurses displayed more confidence speaking up for their patients. Junior nurses highlighted that they needed to learn and understand the reason for medication changes, and doctors felt this was a productive method for communication and educating team ward round team members.

The ability and confidence of doctors and nurses to speak up on the ward round varied. Certainly, the senior doctors and nurses were more comfortable raising clinical issues in front of the patient, but felt this had to be done in a professional manner. All members of the medical team were appreciative of nurses raising concerns about treatment plans and cardiac medications, both on and off the ward round, as long as the patient was not confused by the discussion. The more

junior doctors and nurses did not feel as confident speaking out in front of the cardiologist or registrar at the bedside. See Table 4.16.

Corridor conversations, away from the patient, were commonly observed during ward rounds; however, it was difficult to see all members of the ward round team involved in the discussion. It was usually the registrar and the cardiologist and, if present, the senior cardiac nurse coordinator who were speaking.

Table 4-16: Staff opinions about situational awareness

Participant	Bedside situational awareness			Away from the bedside
	Speaking up at the bedside if you disagree with the treatment plan	**Nurse speaks up at the bedside and advocates for patient**	**Nurse queries a medication at the bedside**	**Nurse speaks up at the nurses' station**
Doctors				
Cardiologist	Extremely confident Somewhat confident if taking over another cardiologist's plan	Consider patient confidence in team and take the conversation away from the bedside. Consider all angles and discuss with other cardiologist; do not want to undermine previous clinical authority	Nurses often have more oversight of the medication chart. Doctors may need reminding. The nurse will then be able to explain this to the patient.	Better conversation for the nurses' station Patient does not get confused; we can go back to the patient later and explain. No problems with speaking up
Registrar	Extremely confident x 2	Helps us understand and advocate for patient's needs. Happy for nurses to raise issues	Nurses have a better cardiac knowledge than rotating medical staff. Listen to any team members concerns and ensure explanation or fix the problem	Happy to take concerns to the consultant
Resident medical officer	Slightly confident	We presume a lot of patients understanding so a nurse's input is valued	Need to document more clearly why we hold drugs so that the whole team understands	Should accept this from CCU nurses
Intern	Slightly confident x 2	Nurses are better at this; I do not feel as confident. Hopefully have these discussions before the bedside ward round	Assess myself first before escalating to senior doctors. Happens quite often here, it's helpful. Make decisions together	Use teamwork and discuss with patient to make decision. Positive

Participant		Bedside situational awareness		Away from the bedside
	Speaking up at the bedside if you disagree with the treatment plan	**Nurse speaks up at the bedside and advocates for patient**	**Nurse queries a medication at the bedside**	**Nurse speaks up at the nurses' station**
Nurses				
Senior cardiac nurses	Extremely confident x 3	Determine what is best for the patient. Ensure the patient understands the treatment plan while at the bedside. Will require doctors or nurse to go back and explain. May need to take it offline	I'll raise it with the cardiologist or registrar. Happy to tell the doctors, they may have forgotten	Phone the registrar to discuss alternative ideas. Can help the patient if they're stable. Use modern technology to help the patient or arrange alternative short-term solution
Registered nurse with <1 year as coordinator	Slightly confident x 3		As long as I have a rationale. I would ask for my understanding and learning	As long as the patient is stable. I already did this yesterday. Ask the doctors if the patient is stable

CCU = cardiac care unit

Decision making on and off the ward round

Decision making was measured as a confidence score. Doctors and nurses were asked how they felt about making clinical decisions away from the ward round, that is, being in a situation where they feel they can make a clinical decision without asking anyone else, although they may speak to them about it afterwards. The initial ward round study captured a slight improvement in confidence regarding decision making when comparing staff surveys before and after the ward round intervention (see Figure 4.14).

Senior medical and nursing staff did not rate themselves as extremely confident about making decisions in all the scenarios put forward in the interviews. One cardiologist said it was easier to decide on the ward round because all the facts were available, which allowed them to make a more informed decision. One cardiologist said they would be more confident ceasing a cardiac monitor or allowing for an unmonitored transfer if the senior nurse could reassure them that the patient did not have any arrhythmias. This shows a level of trust between cardiac nurses and cardiologists.

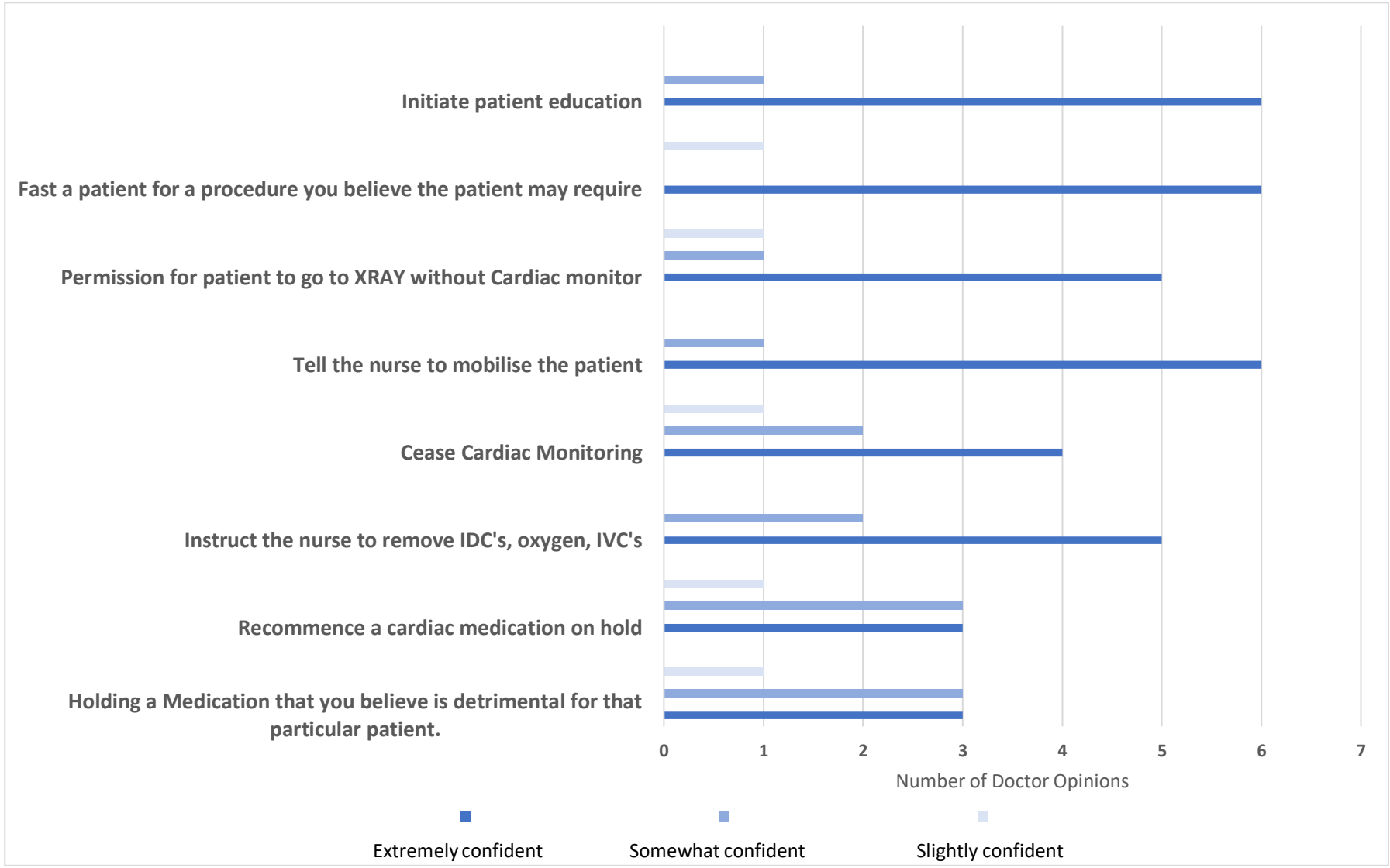
Figures 4.18 and 4.19 show the levels of confidence in decision making outside the ward round for doctors and nurses, respectively. Both senior and junior nurses were less likely to remove an IDC, withhold a medication, cease a cardiac monitor, or transfer an unmonitored patient without consulting a doctor. However, they felt confident about holding drugs that may exacerbate hypotension. Senior and junior doctors felt more confident about decision making off the ward round compared with nurses, except the interns who were more likely to feel less confident. There was an element of junior staff refusing to speak up in the presence of seniors on the ward round; however, junior staff did express that you must go outside of your comfort zone if patient safety and quality care was at stake. Senior medical staff were appreciative of doctors, and nurses in particular, highlighting these concerns as they often needed to be reminded and mistakes needed to be avoided.

Nurses were also supportive of doctors if they could not make an immediate decision off the ward round and wanted to seek clarification from a more senior medical officer. This showed a pattern of teamwork and collaborative decision making amongst the cardiac streams.

Finally, participants were asked if their confidence in decision making for each scenario would change if they were on the ward round, in the presence of all the doctors and the cardiac nurse. As stated earlier, both senior and junior nurses would prefer to discuss most of these decisions with a

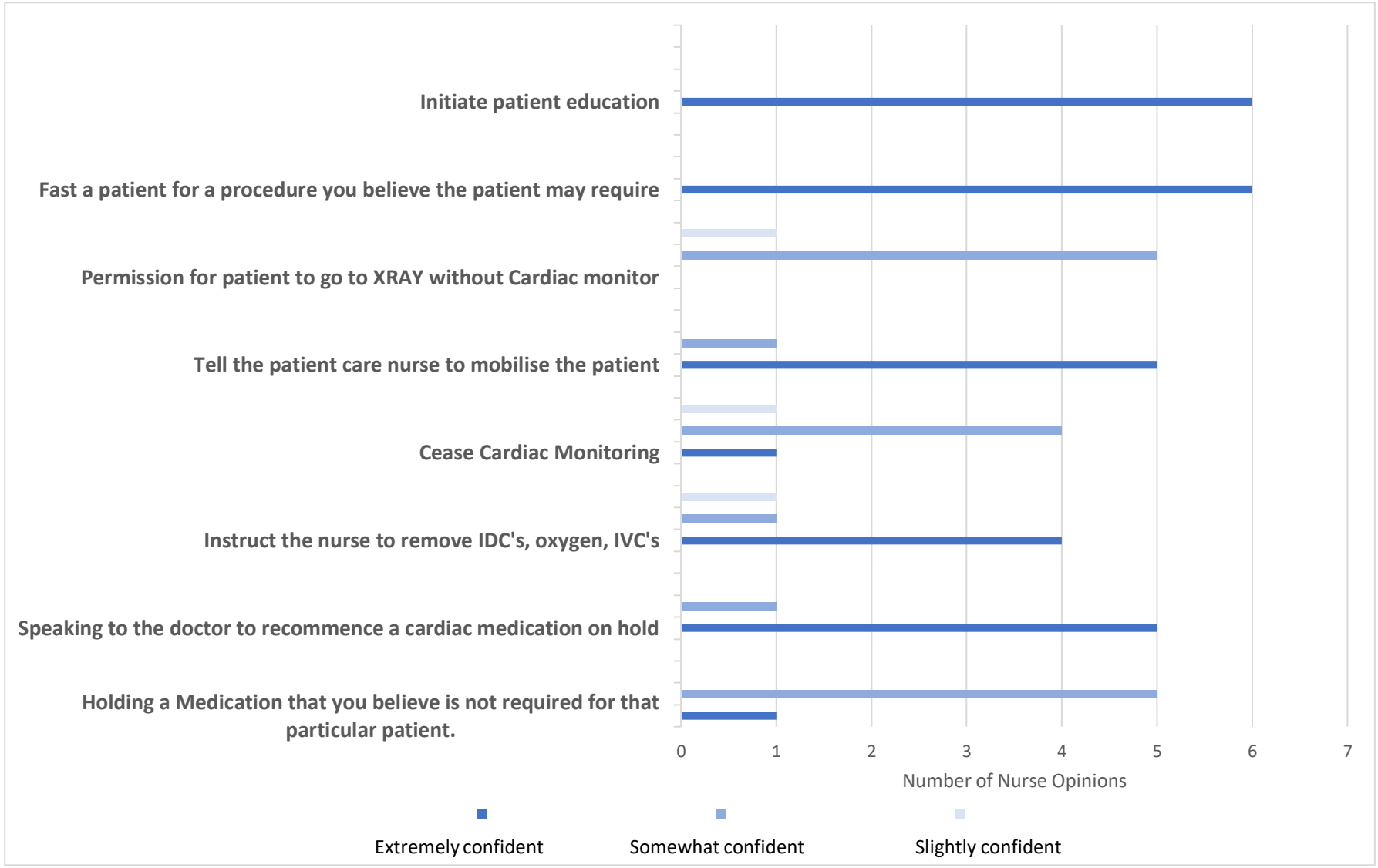
doctor; however, senior nurses felt more confident instructing bedside nurses to mobilise, fast or educate their patients than junior nurses. Doctors were most confident in making decisions about safe unmonitored transfers, patient fasting and asking nurses to initiate nursing care, However, one of the cardiologists thought the ward round would make them feel more confident about their decisions, but that depended on whether they were taking over care from a previous cardiologist who had already made a treatment plan. This wasn't necessarily about confidence but professionalism and continuing the prior cardiologist's treatment plan instead of creating a new one. Both registrars did not feel the ward round would change their level of confidence in decision making, as they are asked to make many of these decisions frequently and always consider the patient's safety. As expected, one of the interns did feel better making decisions with the ward round team, but the other two junior medical staff did not feel this was the case. In fact, one doctor mentioned they felt more in tune and able to make decisions when working after hours away from the team, as they felt they had more knowledge about the situation and this improved their ability to analyse the patient information.

Figure 4.18: Doctors' confidence in decision-making outside the ward round



IDC = indwelling urinary catheter; IVC = intravascular device

Figure 4.19: Nurses' confidence in decision making outside the ward round



IDC = indwelling urinary catheter; IVC = intravascular device

Free comments

At the end of the interview, participants were asked if they would like to make any further comments. Medical staff showed their admiration for the way CCU conducts the ward round and the significant contribution that cardiac nurses make to the team. This includes providing the preceding 24-hour patient information required to make effective treatment plans. It was generally expressed by doctors and nurses that it would be better to always have a nurse on the ward round, even if it is a bedside nurse, but unfortunately nurses have competing priorities.

Doctors rotating through CCU generally enjoyed their CCU placement due to the ward round structure and clinical support they received from the nurses; however, some commented that the ACS ward round was too fast and felt unsafe. It did not allow for a thorough patient assessment and plans could not be documented at the time, leading to missed information. One comment compared it to an orthopaedic ward round;

"Um, you know, akin to an orthopaedic ward round. That comes from the top, because I don't determine the speed of the ward round. But there were times that I was not able to adequately document what was happening before moving on to the next patient. It means I have to come back later, which delays the latest things happening. It's not just so much risk of things being missed. You know, it doesn't allow for a proper assessment of decisions to be made."ID7

Nurses made similar comments about the speed of the ACS ward round;

"I think my only comments would come out of the time on ACS [ward round], which is we sometimes do ward round so fast. I I felt it was unsafe."IN4

This ward round is often done quickly because the new patients are seen by the cardiologist to determine what investigations they need, mostly angiograms, and then the cardiologist has to rush off to the cath lab to perform those angiograms.

Participants made suggestions that more board rounds and post-ward round paper rounds with the nurses were required. One of the innovations suggested separately by a registrar and a senior nurse was to create a WhatsApp group. It was intended to be set up between the doctors, nurse coordinator and the pharmacist to maintain communication about discharge scripts and medication decisions. Unfortunately, the nurse coordinator's mobile phone is not set up to install applications. This has the potential to create an open line between the nurse, pharmacist and stream doctors for information transfer, to clarify treatment plans. Mobile text messages or phone

calls are currently used, unfortunately, most nurse participants did not feel a part of the team when they attended the ward round. They felt that the doctors really do not care if a nurse is present or not because they start the ward round without asking for a nurse. One nurse has been working in CCU intermittently over the last 10 years, but the cardiologists still do not know their name, even though they introduced themselves regularly. This nurse has just started coordinating the ward.

Another nurse has experienced cardiac streaming in another hospital, where it is the bedside nurse's responsibility to attend the ward round and most nurses manage to attend;

"When I was working in New Zealand, the bedside nurse always had to attend the ward round. Also the team leader will come as well." IN4

This is still an issue for our CCU as three streams were often observed visiting a four-bed bay of patients all at once.

Finally, there were conflicting reports from nurses who felt they could not always speak up on the ward round as it depended on which doctors were attending. Personality traits differ among people and some are easier to interact with than others. One of the senior RNs reminisced about being discouraged from speaking up and from asking questions in the past, then conveyed that in our current practice, we must encourage our younger workforce to ask more questions: "We want happy workers because that leads to a productive workforce" (participant IN6).

4.9.2. Part two: Thematic analysis

A variety of main themes and subthemes were analysed and structured around a central concept (Clarke et al, 2015). The thematic analysis for the ward round study first created visual themes from the codes extracted from participants' interview responses. These themes were then structured and categorised for the final analysis. The analysis broke down the codes to create themes according to our conceptual framework, which focuses on doctor and nurse behaviour and their ability to include situational awareness into their workplace culture to facilitate making effective decisions.

The six main themes identified were;

1. Senior expertise is trusted and valued
2. Workload barriers to ward round attendance
3. Expectations of doctors and nurses
4. Teamwork
5. Trusting relationships
6. Optimising the ward round

Subthemes discussed within the themes include:

1. Nurse Surveillance
2. Situational Awareness
3. Workplace Culture
4. Leadership

Theme 1: Senior expertise is trusted and valued

Doctors and nurses rely on senior support to make clinical decisions. They need to have a person to go to for advice and report their findings as "a lot changes in a day". The cardiologists make themselves available to the registrars 24 hours a day. The registrars are advanced trainees and are working in a tertiary hospital education program to eventually develop into a consultant role.

The more experienced senior cardiac nurses have an advanced understanding about the registrar's and cardiologist's roles, and feel comfortable discussing patient and clinical issues with them as they arise. Senior cardiac nurses also display advanced problem-solving skills and are recognised by all levels of the medical staff as having a thorough knowledge about cardiac care. These skills and knowledge reflect the concept of nursing surveillance (Halverson & Scott Tilley, 2022). Some of the less experienced cardiac nurses who attend the ward round feel less confident to speak up, on and off the ward round, as they display a sense of inferiority towards the cardiologists. See Table 4.17. Overall, however, the ward round does have senior support for decision making due to the 24-hour connection with the cardiologist. This support is enhanced when an experienced senior cardiac nurse is present for conversations at or away from the bedside; however, this does not occur regularly.

Table 4.17 shows extracted comments on the theme of trust in senior expertise and use of that support to make effective decisions. Figure 4.20 expresses sentiments about nurses' and doctors' level of expertise. Valuing their team members, especially senior staff, helps build trusting and respectful relationships.

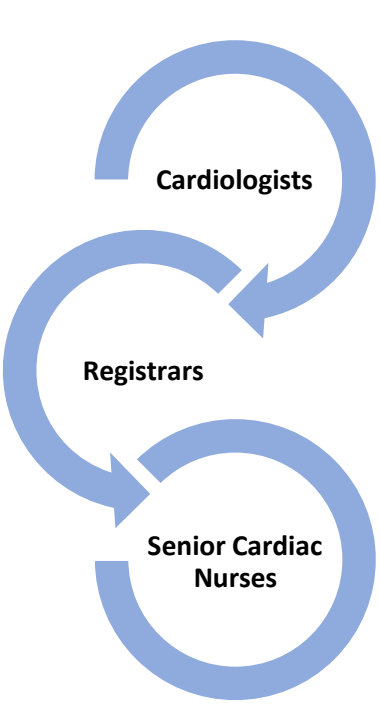
Table 4-17:Collated codes and data extraction for expertise and trust and how that influences decision making inside and outside of the ward round

Expertise and decision making	Trust
"It's because the nurse has more intense oversight of the patient's medication." ID5	"I would support those patients being seen by another senior member of the medical team, such as the registrar." IN3
"There is not always a good communication between us. If there is something I don't know, of course, I will call." IN1	"And I think if it's done in front of a medical round, then it brings it to everyone's attention at all levels. Sometimes as more junior, I find it difficult to escalate those sorts of things like that." ID2
"I think there is a, there was a grey area, and we all know that the patient needs to be cardiac monitored. As a nurse, not sure whether we should or should not. Then I'll definitely check with them [doctors]." IN3	"I'd have a look at it myself. I would look in some eyes and have a look through the notes. If I could find out the reason why that was so, and then discuss it with the bedside nurse. Just to clarify whether I was satisfied with that justification. If I were still concerned, I will escalate it with my seniors." IN2
"And even someone who's been a consultant for 20 years can find it difficult. Okay. That's experience." ID3	"And there's something about the team culture as well that is sort of fostered from that. I feel like there's an opportunity for all the medical team to ask questions of the nursing staff and foster sort of an open communication atmosphere about it." ID2
"I think specifically in CCU, and I find that the nurses have a better knowledge and then the juniors with some cardiac-specific stuff. Yes." ID7	"The cardiologist is the most senior person. They are the ones making decisions with the registrar with sick patients, junior doctors need to follow. What they say weighs a lot. The cardiologist needs to see the patient and should provide supervision, to make sure everyone else is doing the right thing for the patient." IN5
"I think it's a case of the coronary care nurses have a wealth of experience, and they should be listened to if they have concerns." ID2	"I would be grateful at that time. I think specifically in CCU, and I find that the nurses have a more cardiac knowledge." ID6
"Because what we think is a priority is not always seen the same way by the doctors. So, I always just check." IN4 "Explore your options." IN6 "Extremely confident. And what I tell them, what I tell the patient nurse is the rationale for it so that they understand." IN6 "So, it comes down to, I guess, practising within the scope of practice of what you are, what you're legally licensed to do. So, I'm not a prescriber, so I will seek clarification about prescription medication." IN6	"Because I think that can be seen as devaluing our decisions and can also be seen as taking away the authority of the person most responsible. Yes. Or that the patient gets the perception that he or she hasn't got it covered." ID3 "Because I never trust what is being said to me." ID3 "And so, I've got the senior nurse saying there was nothing on the monitor. Yeah, I'm happy with that decision." ID3

Expertise and decision making	Trust
"I feel more confident on the ward round to talk to them about that. Absolutely." IN4 "It's all just common-sense stuff, isn't that. Yeah. Patient management." IN6	"And clearly, they, [the registrars], have the common sense to check up with the consultant. And I know that they do." IN6 "If I can't be on the ward round, um, I make a point of telling them I can't be on the ward round for such and such a reason, always given the reason they know that I trust the documentation and actually documents so well." IN3
"It depends on the patient's best interest or not." ID4	"The team is quite good at prioritising who they need to see." IN4
"Well, if someone's coordinating a shift, they're usually fairly independent and autonomous. And if I, and I can leave them to their devices. Yeah. And that's what I think the patients and the other staff need support. So that's where I'll focus my attention." IN6	"This and I trust our registrars, but they are still learning, and the cardiologist role is to provide that keen knowledge of their gap in knowledge that might be missing. A lot of the cardiologists are not actually on the ward, so this is when they're on the ward and should be providing case-by-case knowledge." IN1
"A funny thing happened when I started nights. I became or made better decisions. I was the one taking on responsibility for that. Whereas in the ward round I feel more like … intimidated by them." ID7	"I think the registrars as advanced trainees are pretty capable of seeing a lot of the patients that may have already been here for quite some time. And I don't think a cardiologist always needs to be there for those long, longer-term patients." ID6
"And following our own set of single-minded decisions, sometimes I think sensible thing to do is to engage other people." IN5	"And I think that ceasing cardiac monitoring is, it depends on the context. And for patients that have had reasonable cardiac monitoring and no longer quite so, I think I would be confident it can be. And I think that is in some lines the role of the registrar facilitating this." IN3

CCU = cardiac care unit
De-identified participant codes: ID = doctor; IN = nurse

Figure 4.20: Staff sentiments about the value of senior expertise



"The cardiologist is the most senior person. They are the ones making decisions with the registrar with sick patients." IN5
"I think the cardiologist is ultimately responsible for the patient, needs to be regularly involved in their care. Whether this means every day, I don't think so." ID5

"I'm really happy with the cardiology registrars. I think they're exceptional, like overall." IN6
"And clearly, they [the registrars] have the common sense to check up with the consultant. And I know that they do." IN6
"I'll just bring it up. At least I'll go and ask the registrar or the consultant right away." IN1

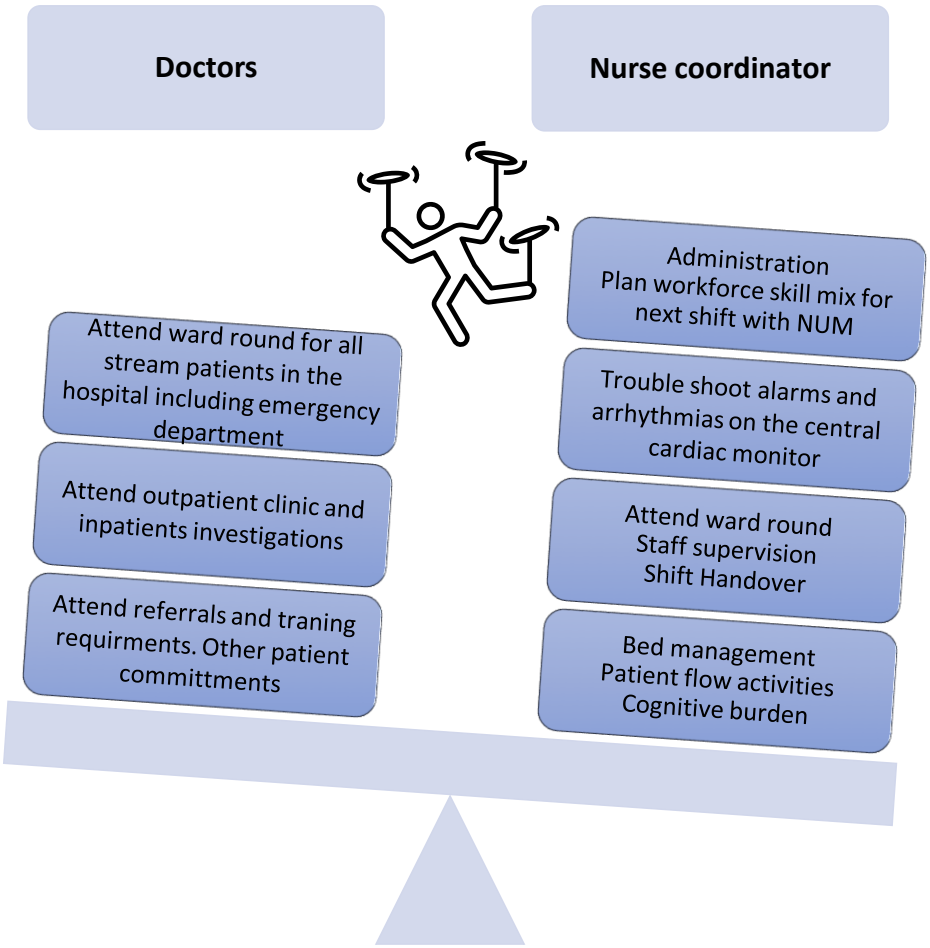
"I think it's a case of the coronary care nurses have a wealth of experience, and they should be listened to if they have concerns." ID2
"I think specifically in CCU, and I find that the nurses have a better knowledge and then the juniors with some cardiac-specific stuff. Yes." ID7
"I have made a mistake and I'm saved by the nurse." ID3
"I think especially in settings like CCU, where you've got very experienced nursing staff." ID5

CCU = cardiac care unit
De-identified participant codes: ID = doctor; IN = nurse

Theme 2: Workload barriers to ward round attendance

Ward round attendance for doctors and nurses is unbalanced. Doctors and nurses juggle their workload to find time to attend the ward round, particularly the nurses but even the cardiologists. Limitations are placed on both groups according to the demands of their clinical and administrative workloads. Conversations away from the bedside are also impacted, as doctors and nurse have competing workload requirements that limit good communication practices to keep up to date with patient care throughout the day. See Figure 4.21.

Figure 4.21: Workload impacts on ward round attendance of doctors and nurse coordinators

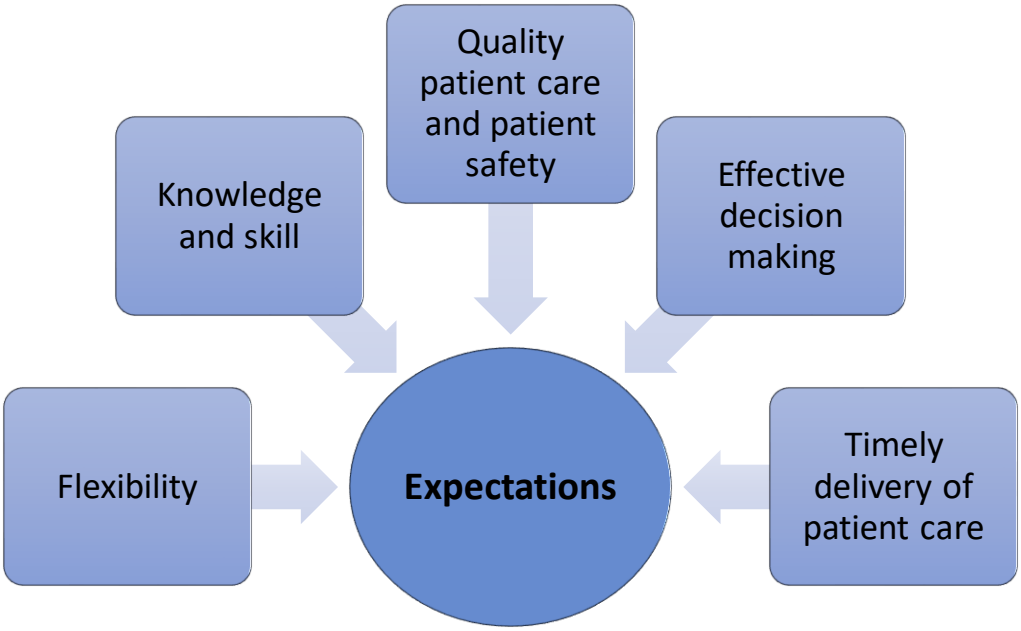


Theme 3: Expectations of doctors and nurses

Doctors and nurses expect effective decisions to be made on the ward round to progress patient care and patient flow through the CCU. This requires a level of knowledge and understanding of the patient, as well as the ability to be flexible according to changes in patient and workload demands that occur on a daily basis. Cardiologists do not expect to see all the patients, whereas the junior doctors and nurses feel it is better if they stay for the whole ward round. Some doctors

also do not see the point of having mandatory off-the-ward-round huddles that are dictated by the system. They prefer to let the staff and state of the ward dictate the necessity to add extra off-the-ward-round discussions with the team. Nurses needing to chase doctors and not feeling included in the treatment plan decision-making processes impact the communication processes. Nurses expect the doctors to come to them or at least document when a plan changes, but this does not always happen. Doctors even stated that they know they should go and tell the nurses themselves but fail to do so. Unfortunately, expectations are not always fulfilled for themselves and each other. See Figure 4.22.

Figure 4.22: Staff expectations of themselves and each other



Theme 4: Teamwork – doctors and nurses working in silos or working together

Teamwork is fractured simply because the nurse cannot make it to every ward round. However, the admiration for nurses by doctors, and the work nurses do to chase doctors and keep them informed does ensure a certain level of teamwork exists. Cardiologists expect their medical staff to keep the nurses informed, and one of them even goes out of their way to find the nurse to update them about their sick patients. Doctors know that if a nurse is not aware of changes in a patient's treatment plan, the patient does not receive the intended care. As shown by the arrows in Figure 4.23, doctors and nurses work together with the patient on the ward round. Doctors are also aware that the reminders and alerts that nurses raise regarding cardiac medications are vital to preventing mistakes and optimising cardiac medication administration. Figure 4.24, however,

shows the arrows moving away from the patient when a nurse is not present on the ward round, which indicates this is against the patient's best interest.

Figure 4.23: Impact of nurse presence on the ward round

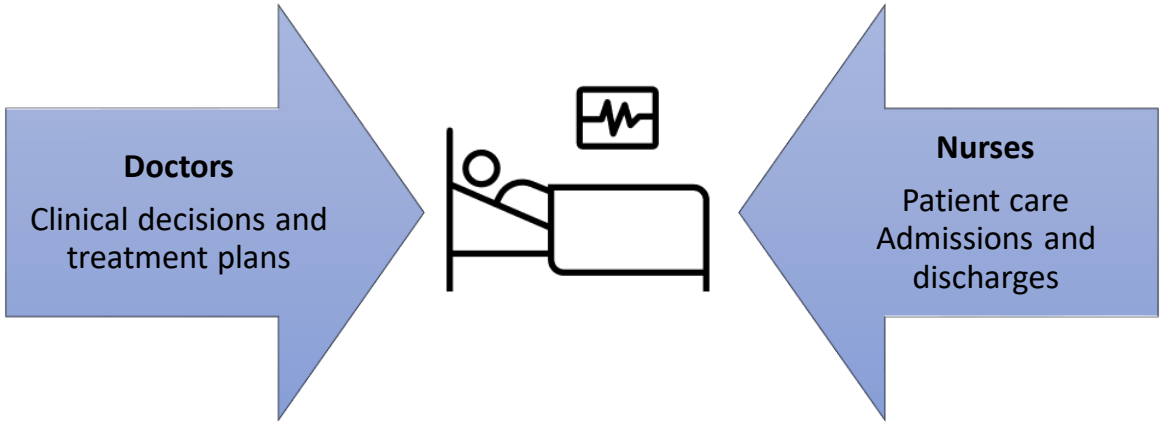


Figure 4.24: Impact of no nurse on the ward round

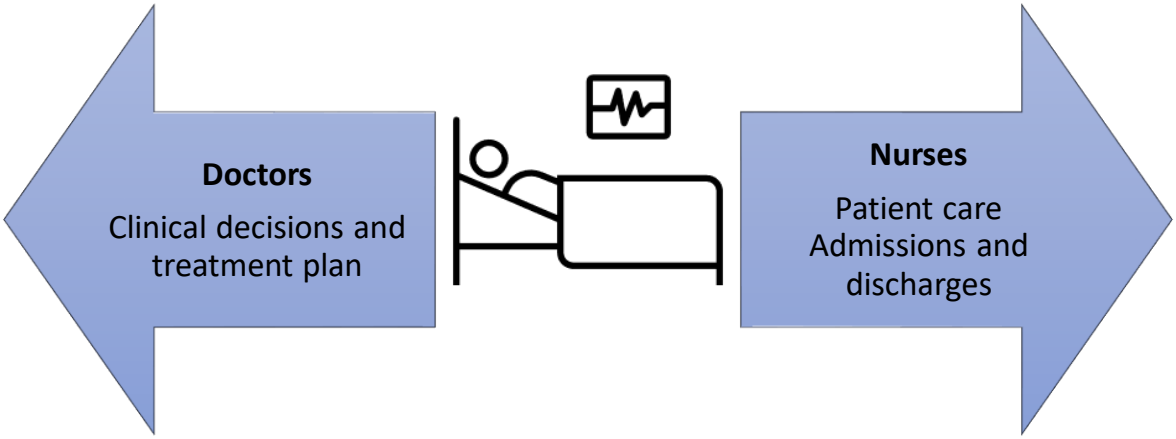


Table 4.18 presents concerns expressed by doctors and nurses about these and other difficulties. These include; nurse attendance; updating treatment plans throughout the day; the lack of accuracy when writing ward round notes; competing workload priorities and the level of expertise each clinician supplies. This breakdown in communication flows onto the bedside care nurses and hampers their ability to deliver up-to-date quality patient care.

Table 4-18: Collated codes and data extraction for doctor and nurse concerns

CODES	Doctor concerns and comments	Nurse concerns and comments
Nurse attendance	"If you have a sick patient, [the nurse] should be there all the time when major decisions are being made. The nurse needs to be there at that time." ID1	"Is the poor communication between doctors and nurses, which is I think it can be achieved really simple if we can get together." IN1
	"It is not possible for nurses to be at three ward rounds at the same time." ID1	"If a nurse is not there for the ward round or the doctor didn't really get a chance to talk to the nurse, then it's I think for both parties that we should make the effort and then to catch up at the end of the ward around." IN1
		"We could just, are still try our best to achieve, at least we attend some ward round." IN1
Patient advocacy and understanding patient's needs	"I don't feel like it's [patient inclusion] done in my very limited experience well amongst the medical team to open this conversation to say why do you not want [treatment] or why, what are the barriers for you?" ID2	"But nurses instead, they got a detailed handover from the last shift, they can speak for the patient regarding any concerns. And that's very important in the part of the team, part of the plan to how to look after the patient." IN2
	"And I think if it's done in front of a medical round, then it brings it to everyone's attention at all levels. Sometimes as more junior, I find it difficult to escalate those sorts of things like that." ID2	
	"Nursing staff are in a better position to know actually what the patient's bothered about. And they might not feel that they could express those wishes, when you've got a gaggle of sort of 10 people standing at the end of the bed." ID5	
	"As a whole thing we don't do consent and understanding very well." ID7	
Handover/ Communication	"It would be nice to have like maybe a debrief afterwards. But it would be good to sort of have like even just a conversation with some of the doctors, some of the nurses, and we all just paper around together." ID6	"I realise many doctors do not look anything at all from the previous shift, so they ask the patient or how do you feel and how did you sleep? Sometimes patient cannot cover all of them or patient doesn't know the priority that they need to mention to the doctor." IN2
	"I'm just a bit against getting together just for whole routine stuff because everyone's busy." ID3	"Yes, I definitely agree if they can stay in CCU, and finish the ward round. Prefer them to see the patient who is discharging, at least if you know if someone is a discharged for that day, and probably see the sick patient, it would be safest." IN1
	"And the other thing we do poorly is documentation." ID7	"So, we often need to discuss that outside of the ward to see what the plans progressed. I didn't manage to speak to anybody." IN2

CODES	Doctor concerns and comments	Nurse concerns and comments
	"Because I know that doctors, we always paper round and even if we just had a nurse with us to paper round, I feel like that would be seriously helpful for everyone. I'm not really sure why we don't do that." ID6	"Fill the gaps and then, you know, just to hand over to something needs to be done and so on. So just make sure we are on the same page." IN1
	"Because often there is a presumption of understanding without ever actually checking that and closing that loop." ID7	"If we can set up the thing that we can catch up after and so that we still know the plan." IN3
		"Help me to empower the patient because I get all the correct information from the team because most of the time, they don't write all the information in the clinical notes …But by hearing it, I know the clear plan better. And so, I can improve the plans for the patient." IN4
		"This is not always a good communication between us." IN5
		"And if doctors are too busy to come give their handover, I find I am just going by the notes and it sounds like second-hand information." IN5
Delays in communication lead to delays in patient care	"Then it gets flagged the next day and that delays the patient in ED waiting for a bed who could have come to CCU quicker." ID4	"Now with bed management and short stay patients we need to text on the mobile but will still page the doctors if they're not on rounds, or not on a ward or still paging them because you know, the phone might be engaged. We might improve communication slightly if we say can have a group chat you know on the, [mobile phone] on a mobile everyone can know." IN1
	"But if you don't update the nursing staff, you've got less chance of that happening." ID3	"If we know what the plan is, but quite often is the communications issue and then the patient is no longer for that procedure. But we didn't know. And then we just kept them on the fasting and stuff." IN1
	"Clinical things can actually be easily missed if the nurse is not there. And that could further delay the patient's care." ID4	"So, if they can update that team leader before they go on about plan for, especially for unstable patients or we have our deteriorating patient, that will be easier for the next shift." IN4
	"Because sometimes the notes don't have the accurate plan." ID6	
Competing priorities	"But the stream thing makes it challenging, and we have competing priorities, lots of sort of middle management who want many boxes ticked and things like that." ID4	"I think it's due to workload and pressures on everyone else". It's almost a daily thing." IN3
	"I feel like a lot changes in the day." ID2	"What I find with a lot of relievers is they don't get much direction from other staff and that is not because the other staff are mean or don't

CODES	Doctor concerns and comments	Nurse concerns and comments
		want to. It's just because the other staff are usually so intensely busy at trying to manage their own workload." IN6
		"I had to come back to the nurses' station for the clinical nurse to go and help the nurses on the floor." IN5
		"Because sometimes if we're stuck in the nurses' station, we can miss something." IN5
Expectations on Junior and Senior Staff	"I find that the medications they have, the intern will be asked." ID4	"It is usually the RMO because the reg [registrar] is so hard to get." IN3
	"The intern is not going to know the answer to that question and/or be afraid to be bothering the registrar." ID4	"Only problem is sometimes we don't have a time to because that is what I found." IN2
	"That comes from on top because I don't determine the speed of the ward round." ID7	
	"And so we really have a 45-minute window to get to the patients very quick. And often you'll find that that, yeah, junior sometimes won't even capture everything at the time in their notes." ID4	
	"But there were times that I was not able to adequately document what was happening before moving on to the next patient, which delays the latest things happening. It's not just so much risk of things being missed. You know, it doesn't allow for a proper assessment of decisions to be made." ID7	

CCU = cardiac care unit; ED = emergency department; RMO = resident medical officer

Theme 5: Trusting relationships

Even though there were expressions of lack of trust, these were very few. The most striking comments regarding trust in colleagues were positive comments made mostly about the nurses by all levels of medical staff. Experienced senior cardiac nurses trusted cardiologists and registrars the most. Generally, trusting relationships do actually exist as this was a repeating theme throughout all the interviews. See Table 4.19 for collated positive and negative comments relating to attributes for a functioning team: respect, feeling valued, belonging and being empowered to contribute to clinical decision making.

Registrars and cardiac nurses all valued each other and were not afraid to discuss decisions as a team when they needed extra input. Senior staff seemed approachable; however, this was not as evident with junior nurses and doctors. They expressed a sense of trepidation when speaking up on the ward round in front of the cardiologist. Figure 4.25 captures themes relating to team relationships from the cardiologists, registrars and senior cardiac nurses (i.e. experienced cardiac nurses who have worked in this capacity from 5–10 or more years). This figure shows the codes related to feelings and attributes that impact team relationships between doctors and nurses

Table 4-19: Collated codes and data extraction for elements of teamwork

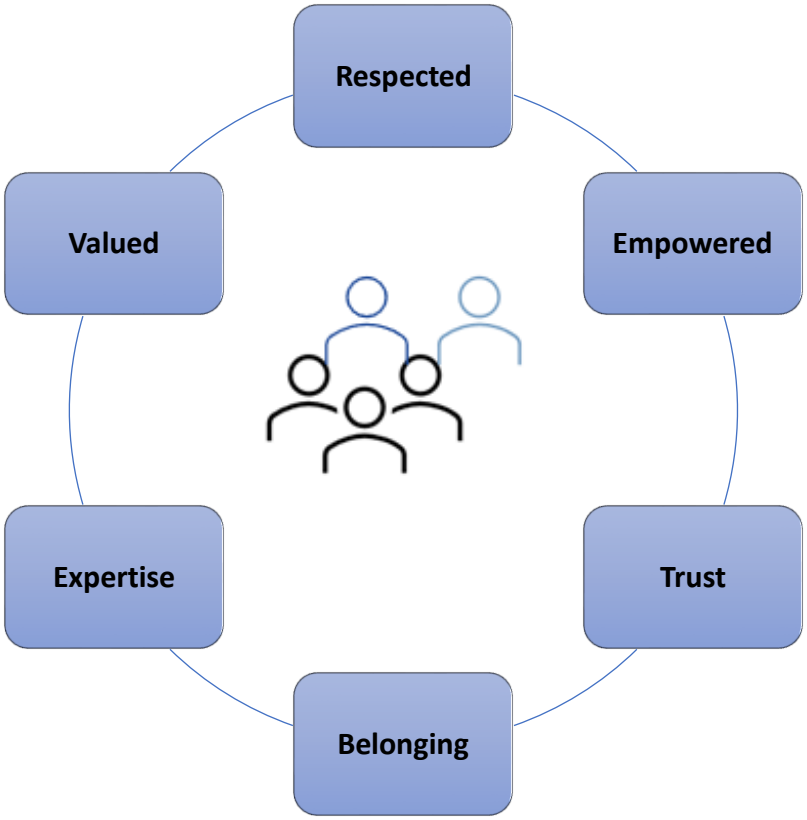
Teamwork element	Positive	Negative
Respect	"I might just ring the registrar and then discuss about the situation." IN1 "It'll be good to have the doctor's input and to support it." IN1	"Depending on which consultants are actually in the ward, some consultants actually make the process of the ward round very, very uncomfortable. And so, you know, not to open your mouth because of their personality, also that it's not a positive environment." IN3
	"I think the cardiologist is ultimately responsible for the patient and needs to be regularly involved in their care …. Whether this means every day, I don't think so." ID5	"I've seen poor behaviour more often from, I think, poor behaviour from doctors where they feel that there's some perceived challenge of authority." ID4
	"Not only is it useful for the whole team to demonstrate capacity and they're again advocating for the patient and making sure that they actually understand." ID5	
	"And I think it's a case of the coronary care nurses have a wealth of experience, and they should be listened to if they have concerns." ID5	
	"I feel like the consultant has a lot more knowledge than me." IN5	
	"But when a nurse sees something and tells me I know." ID3	
Valued	"And the nurse is bringing up questions as well with the doctors and I really like that we can all speak about the patient care as a whole team." ID2	"I don't think the doctors care about if nurses are able to attend so they just go ahead." IN2
	"I'm really happy with the cardiology registrars. I think they're exceptional." IN6	"I feel like I'm just kind of invisible." IN2
	"This has happened, I have made a mistake and I'm saved by the nurse." ID3	"I've been working here for 10 years, and all the consultants do not know my name." IN5
	"If it's taken into the consideration of the treatment plan and the risks and benefits of the options discussed with the nurse. And if necessary, you go to the patient, advise them what the teams recommend." IN2	"When the registrar and consultant are off the ward, it is quite junior staff who might not know how to manage it." IN1

Teamwork element	Positive	Negative
	"I do sometimes wish that the bedside nurses were available, but I know that is not always possible, particularly in a larger base where the patient to nurse ratio is a bit larger because sometimes as a doctor, I feel like I'm not entirely sure that information has made it to the bedside. That's a core part of the work that I don't say gets closed." ID7	
	"I think especially in settings like CCU, where you've got very experienced nursing staff or I mean, you know, someone who has a different point of view. Um, yeah, I like to think that that would be taken seriously." ID5	
Belonging	"I feel like there's an opportunity for all the medical team to ask questions of the nursing staff and foster sort of an open communication atmosphere." ID6	"I do not feel like I'm included in the team." IN2
	"I feel very supported in the structure in the CCU and ward round." ID2	
Empowered	**Self**	**Others**
	"If necessary, you go to the patient, advise them what the teams recommend." IN4	**Doctor to nurse:** "I'm happy to leave it to you. I'm happy for it to be judged case by case. There's nothing decided by itself." ID3
	"Just a direct approach, just tell them. I'm sure there'll be a reason." IN6	"You're telling me that for investigations and management, the patient needs to understand that. And it is the nurse who is reinforcing that message. I don't think that's at all problematic." ID4
	"There are times because you come on and there's a plan being made by the consultant of last week and there's a lot of ways to skin a cat." ID3	"I want nurses to bring it up but not in front of the patient." ID3
	"I think I never say I'm extremely confident about anything, but I'm very confident because it needs to happen." ID7	"I would always listen to their concerns. And if this is something that I hadn't considered then I'm going to take that on board." ID6
	"I think sometimes decisions, difficult decisions, just need further input from maybe a wider thinking circle. I think it's sensible sometimes if you don't know the answer itself, get a consensus of opinions." IN6	"It is appropriate that any team member can have a discussion with the patient." ID5

Teamwork element	Positive	Negative
	"By directly asking, 'Do you understand what the doctors are trying to say to you?', and then you are actually advocating for the doctors to spend more time explaining to the patient what is going on and what subjects I can actually translate from doctor speak to normal speak." IN3	**Doctor to doctor:** "I think the registrars as advanced trainees are pretty capable of seeing a lot of the patients that may have already been here for quite some time. And I don't think a cardiologist always needs to be there for those long, longer-term patients." ID6
	"Yes. But I have to have my own reasoning rationale behind it to support my suggestion." IN2	"That needs to be discussed within the team as is appropriate or not." ID1
	"I would raise, I would put voice why I think that is the case and I would be pretty confident. Yeah." IN4	
	"And if you think that something's missed or something's not right, you have an obligation. You have a duty to say something." IN2	
	"If I can't find rationale for doing something, I generally don't do it until I know the rationale." IN6	
	"I would actually go, okay, let us go talk to so and so." IN3	

CCU = cardiac care unit

Figure 4.25: Codes that relate to team relationships



Theme 6: Optimising the ward round.

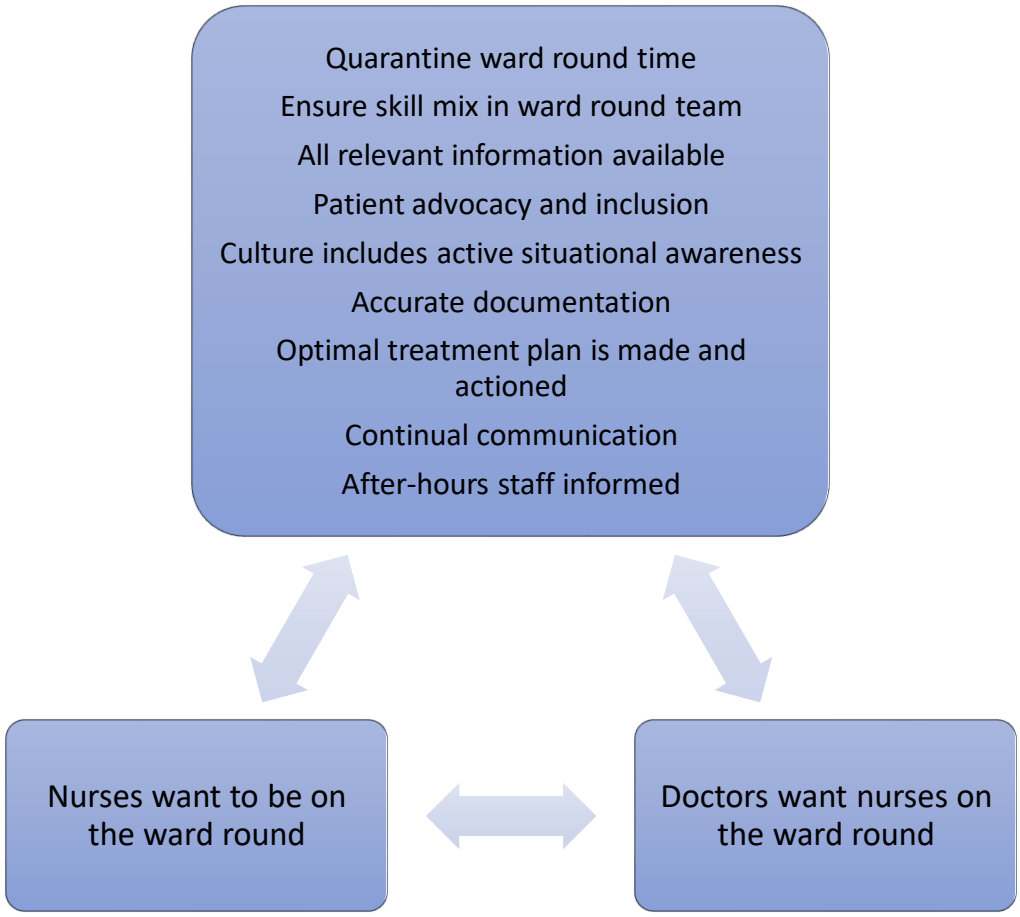
Exploring positive and concerned comments by staff revealed elements that will contribute to better ward round practices. Both doctors and nurses want nurses to be a part of the ward round, both at the bedside and away from it. Nurses hearing the bedside and non-bedside discussion is considered superior to them reading the patient notes. Clinical decisions and patient flow (admissions and discharges) do not occur in the patients' best interests if nurses are not able to know about or contribute knowledge to clinical decisions while patient treatment plans are formulated.

Regular communication paths that are adhered to would make it easier for doctors and nurses to keep up to date with patient needs and patient flow, both in hours and out of hours, that is, throughout the 24-hour patient journey. Doctor paper rounds are already embedded into daily practice. By including nurses at doctor paper rounds, as well as at the end of the day before the doctors leave the hospital, communication could be optimised and after-hours staff will be better informed.

Other practices for optimising ward rounds include fostering situational awareness so that everyone feels comfortable speaking up in front of the team, although maybe not always in front of the patient, so that red flags and concerns can be raised and a safer learning environment is created. Finally, documentation is considered lacking in quality due to the fast pace and fractured nature of the ward round, which may impact patient safety. Doctors felt they needed more time to accurately document ward round examinations, discussions and treatment plans.

Cardiac streaming improved decision making due to the nature of categorising patient diagnoses. Study 1 showed that quarantining the ward round, especially for nursing staff – to ensure that the right people are available to ensure, that the patient is included, and that clinical decisions are made for the right patient at the right time – has benefits for timely delivery of patient care. Unfortunately, there are no nursing resources available to facilitate regular nurse attendance on all three ward rounds at the present time. Translating this research into practice and providing the appropriate nursing resources needs to be addressed by the department and hospital executive. Further leadership and support outside of the ward round and CCU is required. Figure 4.26 shows the principles we need to focus on for future CCU ward round models, according to the thematic analysis.

Figure 4.26: Principles for optimising the ward round, derived from thematic analysis of doctors' and nurses' interview responses



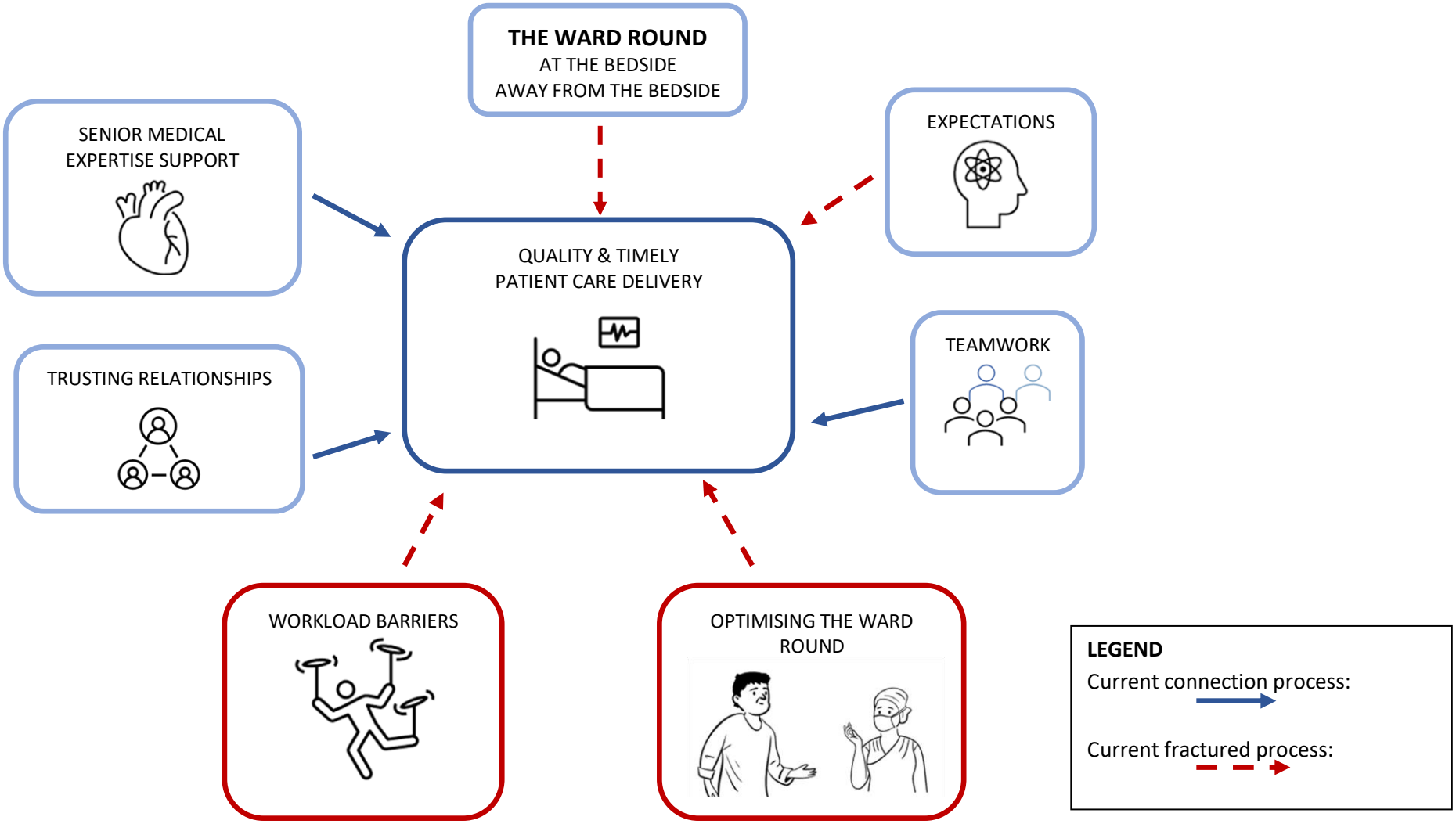
4.10. First thematic map

As previously discussed, various figures and tables were developed from the coded interviews. Six preliminary themes were derived using participant comments regarding workload barriers, expectations of themselves and others, the presence of teamwork, senior expertise, exhibited trust for each other, and positive and negative concerns regarding the elements that would optimise the ward round to deliver timely quality patient care. We also identified four subthemes when discussing these themes. These include nurse surveillance, situational awareness, leadership and workplace culture. Combining all of theses themes and subthemes has allowed us to create the first thematic map which unfortunately is not always connected to the delivery of quality timely patient care.

Figure 4.27 presents the first thematic map, showing factors that are currently able and not able to contribute to the delivery of quality, timely care from a functioning ward round, at and away from the bedside. Ideally all six themes would be connected to quality and timely patient care delivery, but unfortunately the figure only shows three themes are connected for our CCU. These

are senior medical expertise support, trusting relationships and teamwork. This shows that leadership needs to ensure the unit has a workplace culture that supports nursing surveillance, and functional situational awareness between doctors and nurses. Therefore, to ensure a functional ward round, the other three themes, expectations, workload barriers and elements that optimise the ward round need to be connected.

Figure 4.27: First thematic map: current state of the CCU ward round



This figure shows elements that fracture the current ward round restricting delivery of quality, timely patient care.

4.11. Final thematic maps

This analysis now leads to the final thematic map for answering the second study question.

> "Has the culture and practice change on the ward round to improve efficiency of care and patient-reported outcomes been sustained 1 year later?"

Our final objective was to see if a culture change has occurred following the ward round intervention that has sustained benefits to the timely delivery of quality patient care. Without regular cardiac nurse attendance on the ward round 1 year after the intervention, our results show that the culture change has not occurred.

If we are looking for a culture change, that supports this practice change, then we should acknowledge behaviour as a marker that has an impact on patient care. As previously discussed in Chapter 2, the behaviour change wheel (Figure 2.4) is a framework that supports the success of implementing practice change. This framework states that behaviour is impacted by capability, opportunity and motivation. The interviews show us that the staff already have the motivation to deliver quality and safe patient care, plus attend the ward round. It is the nurses' practice capability plus the physical opportunity to attend the ward round that are missing. So, of the three centre principles of the behaviour change wheel, two are already missing. The next ring of the behaviour change wheel shows us the nine intervention functions that need attention: environmental structures, education, training, modelling, enablement, coercion, incentivisation, persuasion, and acknowledging the restrictions that are already in place. Finally, the outside of the wheel is enveloped in policy categories that provide the executive support for the practice change (Michie, 2014; Michie et al., 2011). To ensure successful adoption of the practice change, two actions are required: leadership support and optimising our nurses' scope of practice. These actions ensure that nurses feel they belong to the cardiac stream and are empowered to be involved in clinical decision making. This will be called cardiac nurse streaming. Cardiac nurse streaming is where a nurse actually belongs to each of the ACS, ARR and HFS cardiac streams. However, nursing leadership is required to roster and support cardiac nurse streaming. The final thematic map is shown in Figure 4.28. This figure presents a future state of the ward round if the organisation wanted to adopt this practice change and optimise ward round structures. The final thematic map addresses the two outer circles of the behaviour change wheel.

The directed acyclic graph for an effective decision on the CCU ward round (Figure 2.5) has also been revised. Organisational support and leadership has been added to the environment, cardiac

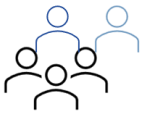
nurse streaming and patient inclusion to the patient voice, staff expertise (senior cardiology support) to knowledge, staff expectations and trusting relationships to culture, and an optimised ward round to the effective decision. See Figure 4.29 for the incorporation of this possible sustained ward round culture change into the directed acyclic graph for an effective decision.

Figure 4.28 and 4.29 are therefore the ultimate future state thematic maps that have been extracted from the staff interviews.

Thematic map legend

The following symbols are used in the final thematic map and the revised directed acyclic graph:


Organisational support and leadership


Teamwork


Expectations: team and individual


Trusting relationships


Senior cardiology support


Optimised ward round


Patient inclusion


Cardiac nurse streaming

Figure 4.28: Final thematic map (future state): cardiac nurse streaming model to improve the CCU ward round and sustain culture change to maintain quality and timely patient care delivery

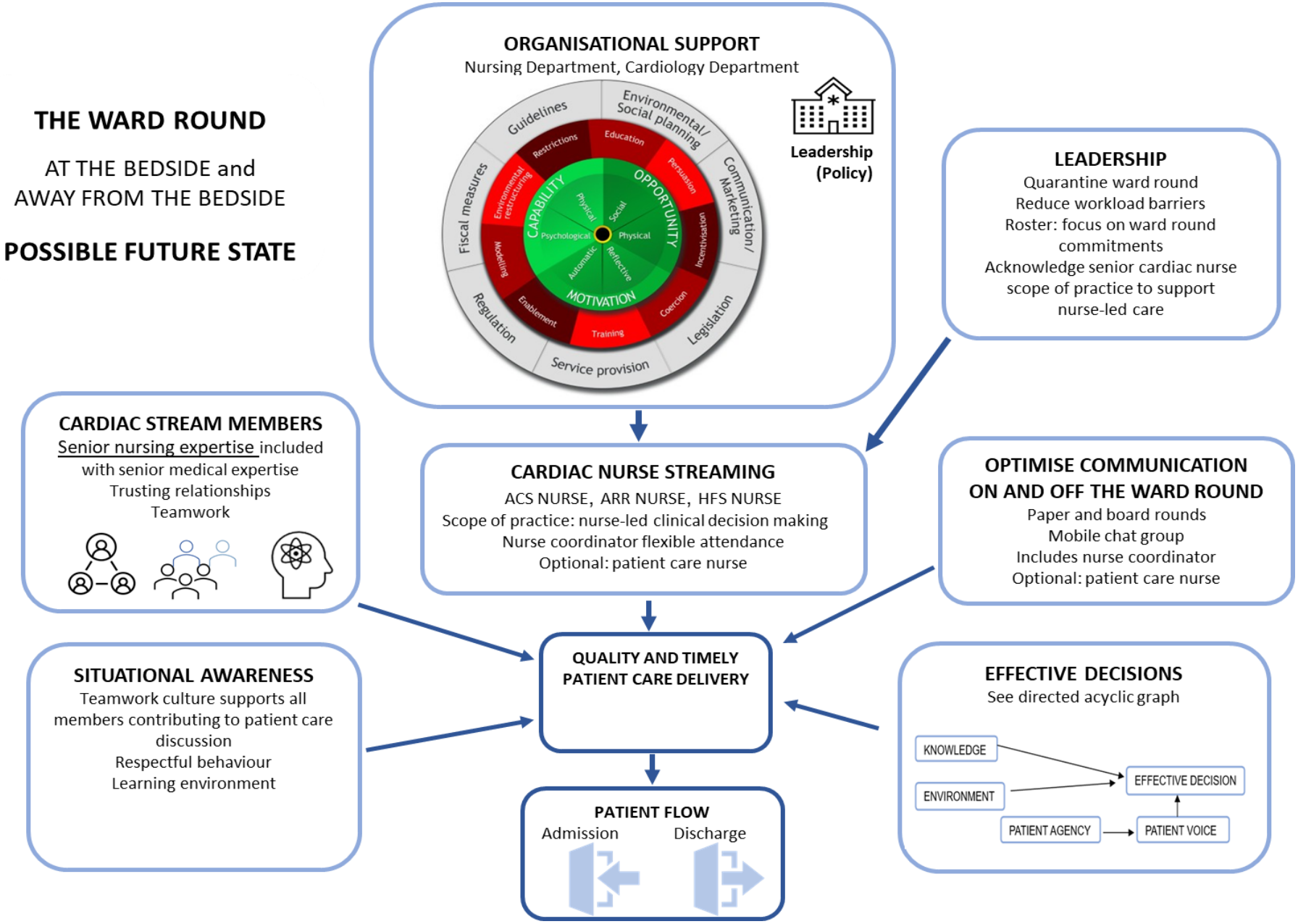
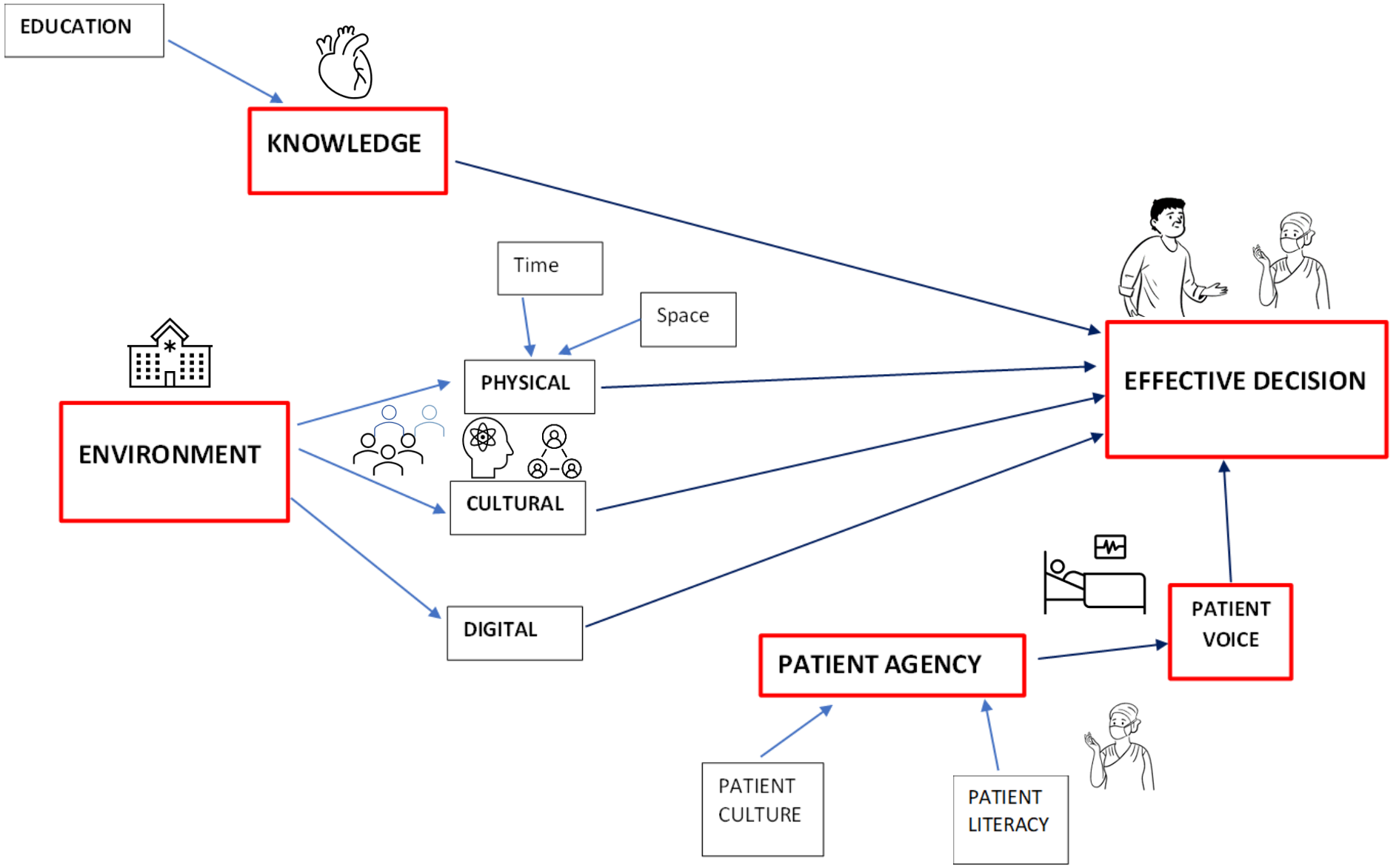


Figure 4.29: Revised directed acyclic graph: effective decisions including sustained ward round practice changes



(Textor et al., 2016)

4.12. Follow-up study conclusion

The aim of this study was to ensure evidence-based clinical decisions were continuing to be made by doctors and nurses on and off the ward round, in an environment that supported effective decision making and included patient participation. Both qualitative and quantitative measurements prove that this has not been achieved, ultimately impacted by the inability for a cardiac nurse to attend the three cardiac stream ward rounds, as well as having no formal or inclusive communication structures.

Results for Objective 6 showed that a culture change where doctors and nurses work more closely as a team had not actually occurred. In fact, there is evidence that doctors and nurses are still working in silos and, even though individuals practise with good intention, there is no connection between nurses and the cardiac streams. However, the thematic analysis discovered many principles that can be used for future ward round research. Therefore, two final thematic maps show that cardiac nurse streaming could be a possible addition to the ward round that might create a sustainable culture change.

4.13. Results chapter final conclusion

Objectives 1 through to 4 were met by the quantitative success of the re-engineered ward round. Shorter cardiac medication administration delays, with positive achievements in fasting, bed rest and patient education, provided the quantitative evidence that improving doctor and nurse collaboration and decision making does reduce delays in patient care. Having a nurse on most of the ward rounds also achieved our objective of improving patient advocacy and the culture of teamwork between CCU doctors and nurses. Objective 5 tried to deliver a treatment plan that is fully understood by all patients. This did not always occur, but we found that, even though patients did not always understand the treatment plant, the majority were highly satisfied and appreciated being included in the bedside treatment plan discussions.

Even though the intervention was successful, the follow-up study showed that patient care delays continued and a continual positive teamwork culture between doctors and nurses did not occur outside of the intervention, either statistically or qualitatively. Therefore, Objective 6 could not be met. Unfortunately, the second study proved that there was no sustained effect on quality and timely patient care delivery 1 year after the initial ward round intervention.

The second study did reveal a lot about the high respect doctors and nurses have for each other and how they can work together as a team when workload permits. It also highlighted faults in the ward round intervention design and why ward round structural compliance was limited. This is valuable information for future ward round intervention designs. The follow-up study also discovered that the more senior and experienced cardiac nurses seemed to be a better fit with the culture of the team, which has given rise to a new possible option, cardiac nurse streaming.

The thematic analysis found that trusting and respectful relationships do exist between the cardiac doctors and nurses. However, this culture is underutilised. All doctors and nurses want nurses to attend the ward round. Understanding the behaviour change wheel and the factors that contribute to an effective decision using the directed acyclic graph, we know that staff have the motivation, capability and knowledge to make effective decisions, but only some have the experience, confidence and ability to influence team dynamics and culture. If the organisation provides an environment and creates policies that ensure every ward round team contains a nurse we may have a better chance of sustaining effective decisions that deliver quality and timely patient care.

The next chapter will combine these thoughts and discuss in more detail what we have learned about staff behaviour through these ward round studies and how we can offer teamwork practice changes that will influence quality patient care.

CHAPTER 5. DISCUSSION AND CONCLUSION

In the previous chapters, the ward round study developed the question of how nurses attending the ward round, plus structural changes to the ward round, benefit the timely administration of patient care, and whether a workplace culture and practice change had occurred 1 year after the initial ward round intervention. A multimethod approach used quantitative measurements of cardiac administration delays and other key clinical activities to provide comparison statistics between the control, intervention and 1-year follow-up periods. Then qualitative methods were adopted to find out about patients' satisfaction and their personal understanding of their treatment plans, and to capture doctor and nurse perceptions of the ward round processes. The qualitative data revealed the attitudes and feelings of the nurses and doctors and how they interact with each other. This then enabled us to understand the dynamics, teamwork and therefore culture that exists within the workplace.

In this chapter, we combined the qualitative and quantitative results with our conceptual framework to better understand doctor and nurse behaviour and decision making in a changing environment so that we can put in place future evidence-based ward round structures that will contribute to a CCU centre of excellence. This chapter will discuss the strengths and limitations of this research, it's contribution to knowledge, and implications for practice and future research.

5.1. Strengths and weaknesses of this research

Single-centre research is regarded as less robust than multicentre studies because it is less convincing that findings can be spread across the general population. One must consider the perspective and scope of the study to determine the relevance of its findings (Borm et al., 2008). However, few ward round studies in the literature have been implemented across multiple hospital sites. It is the contextual nature of ward round studies that provide strength in their practice change (Augustsson et al., 2019; RCP & RCN, 2021b). The intervention in our study has provided an exemplar to develop ward round practices within this and other hospitals in South Australia, especially those that already have cardiac streaming in their cardiology departments. The primary investigator has been approached by the hospital clinical improvement committee to explore future ward round structures outside of the CCU. Therefore, choosing an individual cardiac unit embedded with its own ward round routine, staff interaction and behaviour provides a

microclimate to study changes in practice and see benefits to patient care that can be applied to the general patient population.

That is the paradox of this study. What seems like a usual weakness can turn into a strength in this research, because the primary investigator is so embedded in clinical practice. As a cardiac nurse who has spent the last 32 years working in the CCU, I had the opportunity to step back with a research mindset, or equipoise, and study the structure and behaviour of colleagues' ward round methods. Then, in the search for excellence, I have adapted what has already worked in previous studies, found out what we are missing, and used what we already know about change management to finally apply evidence-based practice. So, by identifying the knowledge gap as the measurement of key clinical indicators, particularly cardiac medication administration delays, and the necessity of nurses on the ward round, this research has successfully answered the research question, "do nurses belong on the ward round"? Let us now explore the strengths and weaknesses more closely.

5.2. Strengths

5.2.1. Context and relevance

This is a small single-centre study that examined the behaviour of doctors and nurses as they work closely together in the three cardiac stream ward rounds. Few ward round studies have been implemented in multicentre sites. Britain documented the largest ward round research project when the Royal College of Physicians and the Royal College of Nursing collaborated to form the NHS ward round guidelines (RCP & RCN, 2012, 2021a). Even though this is a national document, individual sites around Britain are implementing parts of the guidelines to suit their needs according to the healthcare location and context. Most of the results of the research were qualitative and benchmarked standard KPIs against single-centre sites. No other study has measured cardiac medication delays or the other key clinical activities used in this thesis study, except for length of IDC insertion.

5.2.2. Trust and respect/primary investigator relationship with stakeholders

The primary investigator works within the CCU as a senior cardiac-trained nurse, even participating in the intervention ward rounds due to rostering requirements. This admittedly can be seen as a bias, as it limits objectivity in qualitative results analysis to one person. However, the primary investigator attended 2 of 15 ACS ward rounds and 1 of 15 HFS ward rounds throughout the 6-week intervention period, that is, 3 out of 45 ward rounds throughout the entire 6-week

intervention period. This is a small amount of intervention exposure and should therefore have little influence on the statistical results.

It is often laborious for academic university staff to access a clinical environment for their research. This PhD was set up as a clinical PhD, so extra permission from the site was not required as the primary investigator is employed by SA Health. Stakeholder engagement was improved because the intervention was not being implemented by an outsider. Support from senior medical and nursing staff, as well as collegial support from the doctors and nurses working on the unit, was already in place. Cardiology grand round presentations helped engage stakeholders and, therefore, acceptance by doctors and nurses to try something different. As a nurse PhD candidate, the primary investigator seemed held in high recognition and respect for participating in clinical research. This and the perceived leadership role, cultural credibility and collegial relationships seemed to make it easier to influence positive behaviour. As a stakeholder herself, and with the influence of her supervisor's support, being the head of cardiology at the time, it was easier to gain participants' engagement and compliance in the research. Encouraging nurses to attend the ward round and doctors to follow-up treatment plan communication with nurses was not perfect, but staff were willing to try it.

5.2.3. Clinical nurse researcher

This nurse clinical PhD also provided an example of an alternative nursing career pathway. Nurses can be mentored with nursing research and drive evidence-based care without leaving the patient bedside, thus creating possibilities, and opening the hospital nursing executive to supporting more nursing research within the hospital. By disseminating these findings, the primary investigator has become more confident and articulate when addressing patient care issues and the plight of cardiac nurses within hospital executives, who are listening and acting. Therefore, the research, leadership, writing, and presentation skills obtained through this process has benefited not only the PhD candidate's professional abilities but also advocacy for patient care, nursing workload and patient flow.

5.2.4. Staff interviews

The interview process captured relevant and inclusive data about the ward round structure and staff behaviour. The volunteers who participated gave open responses to the questions and provided informative opinions about their feelings towards ward round attendance and delivering

safe and quality patient care. The thematic analysis provided a more co-designed option for future ward rounds and a vision for where this research could now progress.

5.3. Limitations of this study

5.3.1. Re-engineered ward round design

The design of the re-engineered ward round could be considered flawed from the very beginning. It was not co-designed with the staff or patients. The only stakeholder engagement was in the form of a staff survey and brief presentations prior to the intervention. Doctors and nurses were told about the new ward round structure and what was expected of them before, during and after the ward round on the Friday before the next Monday's 2-week implementation. They were expected to comply. Compliance was measured and found to be variable. This was done to remove contamination from the controlled ward round where we wanted workflow to remain unchanged. This allowed us to see a difference when the intervention was "switched on". It was the staff interviews at the end of the research that truly engaged with the stakeholders and delivered information that could be used to design a future ward round study. Therefore, traditional change management strategies were reversed and co-design occurred at the end of the study.

Also, the study occurred over a relatively short period of time. This was because we were following the 12-week RMO placement rotation through CCU and trying to prevent too much contamination with new staff.

5.3.2. Single-centre study

As mentioned earlier, this research may not seem robust as it was a small single-centre study, carried out over a short 12-week period. The primary investigator is a clinical nurse rostered in the unit, intermittently participating in the ward round process, which constitutes a bias. This same bias also exists with the thematic analysis of the staff interviews, which was undertaken by the primary investigator alone, without any other objective viewpoints, although the collegial relationship with the participants was a strength in gaining their participation and openness in the interview process. Delays occurred and the interviews were captured almost 2 years after the original intervention instead of the intended 1 year.

5.3.3. Compliance

Compliance with the ward round intervention, particularly use of the proforma, was a challenge. Preliminary work to identify enablers and barriers to behaviour change and positive adoption of the new ward round model was missing. We relied on leadership from the cardiologists and nurse unit manager, and CCU staff taking a leap of faith and following the intervention. Therefore, there was a lack of compliance with the away-from-the-bedside communication strategies and completing the proforma and checklist. In addition, sick leave during the intervention could not be covered, which meant that sometimes nurses were not available for the ward rounds. Although there were intermittent gaps in compliance, we still managed to see positive results. The second study helped us understand the compliance issues a little better and provided better insight into workable structural changes for the ward round. So, even though the lack of compliance with the intervention did occur, it did not make a large difference to the statistical results, and we have learned a lot about workable CCU ward round structures.

5.3.4. Data capture

Statistical data capture methods in the first and second studies were not identical. In the initial ward round study, we captured some data from EMRs, for length of stay, readmission rates and fasting times, but had to rely on paper records, including paper drug charts, for other data. In the second study, all data was taken from EMRs, and eMars for drug charts. Noting that we were comparing primary endpoints from a paper-based drug chart to a computer-based drug chart, there may have been a difference in data capture between the two studies. For example, a practice change was noted when using the eMar instead of paper records, whereby there was no option for doctors and nurses to mark medications for review as with paper charts. The eMar uses only “suspend” or “unsuspend”. eMar doses ordered on the ward round, after 8am, were not scheduled until the next dose. This could be 6pm for a twice-a-day dose, or even the next day if they were a daily dose. When no extra “catch-up” dose was ordered, ward round documents did not reveal if this was deliberate. Cardiology doctors were informed of this noticed practice change at the time of the audit in February 2023, ensuring that more immediate doses were ordered by the doctors to counteract the delays. Therefore, future research using eMar records only to compare medication administration time delays may give a more accurate picture than the data in this study.

We chose not to test for statistical significance in the second study. We used a non parametric test (Kruskal-Wallis) for our quantitative data in the first study to measure the effect of having a

nurse on the ward round during the intervention. We were not looking for statistical significance in the second study as the null hypothesis predicted we would not see and improvement as there was no intervention at that time. Comparing the medians did not provide any positive trends that would indicate improvements had been made after one year.

However, we did noticea shorter length of stay for ACS patients in the second study data capture. Another potential influence on study results was the COVID pandemic. COVID was in its third year with ongoing waves occurring during the 1-year audit period. Many patients were admitted to the ACS stream with chest pain that was not necessarily due to ischaemic heart disease, and pressure on bed availability likely influenced early discharge decisions. Therefore, the shorter length of stay observed for the ACS stream in the second study may have been influenced by COVID rather than the ward round itself.

Survey Limitations:

1. Survey Development: The questions were crafted by a research team, PI, supervisors, and a cardiology research colleague with survey-writing experience. This indicates that the questions were developed with expertise in mind.
2. Ethics Review: The survey questions underwent thorough review by an Ethics committee to ensure they were appropriate for the studies and that confidentiality was maintained.
3. Lack of Pilot Testing and Validation: Although the study was not piloted or validated, having experienced individuals involved and passing an ethics review helps ensure questions are relevant and ethically sound.

5.3.5. Executive support

Another problem during the research project was the lack of nursing executive support or interest within the medical division. It was difficult to engage with them and present findings along the PhD journey. This was the first clinical nursing PhD conducted within the division, but other than facilitating the rostering for a clinical research nurse role, there was and is no divisional nursing research culture to support nurses who want to pursue this as a career pathway. The primary investigator tried to engage with the nursing executive, but a collaborative relationship was not successful. This might make it difficult to present the results and implement evidence-based practice. Therefore, even though including a nurse on the ward round as a patient advocate will hopefully address patient needs and enable them to voice “what matters to them”, the challenge

will be getting the nursing executive in the department of medicine to help us roster cardiac nurses on each of the three cardiac stream ward rounds.

5.4. Contribution to knowledge of this thesis

5.4.1. Compliance culture

Healthcare organisations are bound by Australian healthcare governing bodies to ensure the staff within the institution are compliant with policies, procedures, and guidelines, as a method for quality control and to protect the organisation from litigation and financial peril (Grimm, 2018). Rules and regulations provide boundaries that doctors and nurses must comply with the organisation's strategic direction and work within the legal authority to provide healthcare (Braithwaite, 2018). But this bureaucratic control of healthcare delivery and micromanagement that our healthcare professionals are experiencing limits their ability to individualise patient care at the bedside. Do our doctors and nurses truly have the freedom to make effective clinical decisions (Braithwaite et al., 2020)?

The ward round intervention in this thesis study attempted to create a culture that stimulates independent thought and encourages decision making. In the pursuit of building excellence, we are requesting doctors and nurses to change practice. Too often nurses are bound by organisational rules and regulations while still needing to follow best practice guidelines that determine how we are to deliver standards of care. One could postulate that the organisation's control over protocols and limitation of contextual evidence-based practices restrict nurses to working within a narrow scope of practice. Rather than feeling confident about their knowledge, assessment skills and experience, nurses are not allowed to rely on their own individual professional integrity and need permission to work up to the highest level of their scope of practice (Augustsson et al., 2019; Braithwaite, 2018; Halverson & Scott Tilley, 2022).

5.4.2. Workplace culture and staff behaviour

Keeping the team together on the ward round and ensuring they are performing at their peak was a challenge in both ward round studies. The second study proved that quality, timely patient care delivery could not be maintained if a nurse was not consistently available on all three ward rounds. However, great insight into doctor and nurse behaviour has been achieved. Both studies highlighted six major components that can be used to address future studies. These are:

Primary and secondary outcomes: Nurse attendance on the ward round reduces delays in cardiac medication administration and improves delivery of quality patient care for other key clinical activities, especially patient mobility, fasting rates and patient education.

Patient expectations: Patient surveys revealed**,** Patients are satisfied with their care, but want to be included in making decisions about their treatment plan.

Staff expectations: Staff surveys revealed, staff want leadership from cardiologists to assist with confidence in decision making.

Workforce issues: CCU staffing and activity leads to unavailability of nurses and fractured medical attendance for the ward round.

Staff interview thematic analysis:

- Workload barriers
- Expectations
- Teamwork
- Senior expertise availability
- Trusting relationships
- Optimised ward round practices

Directed acyclic graph, (DAG) for an effective decision: the four elements are the environment, knowledge, patient agency and patient voice.

Figure 5.1 shows how all these components and the information gained from both ward round studies interact with each other. Using our previously discussed conceptual theories, namely the theoretical domains framework (TDF) and the behaviour change wheel (Figure 2.4), we can better understand doctor and nurse behaviour on and off the ward round. Bai et al. (2022) used both strategies to improve prescribing and overprescribing strategies within the community (Bai et al., 2022). Incorporating this model into our ward round research, we first need to address the individual's psychological and physical ability, the external influences, and their incentive to participate in the ward round, both at and away from the bedside. A framework defined by Michi et al. (2011) as the "COM-B system" helps us understand how capability (C), motivation (M) and opportunity (O) interact with each other and influence a person's behaviour (B) (Michie et al., 2011). See Figure 5.2.

Figure 5.1: Ward round study implications for behaviour

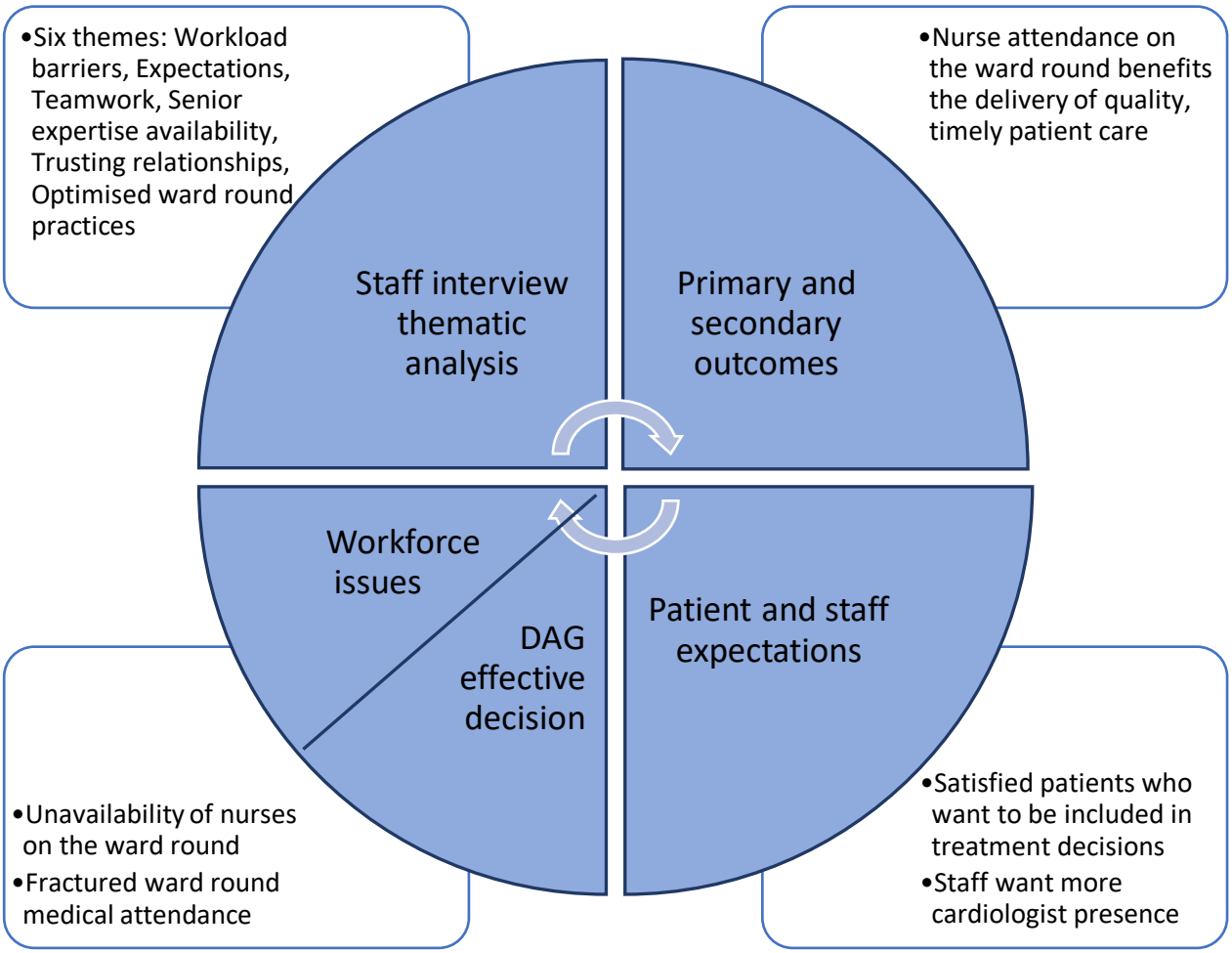
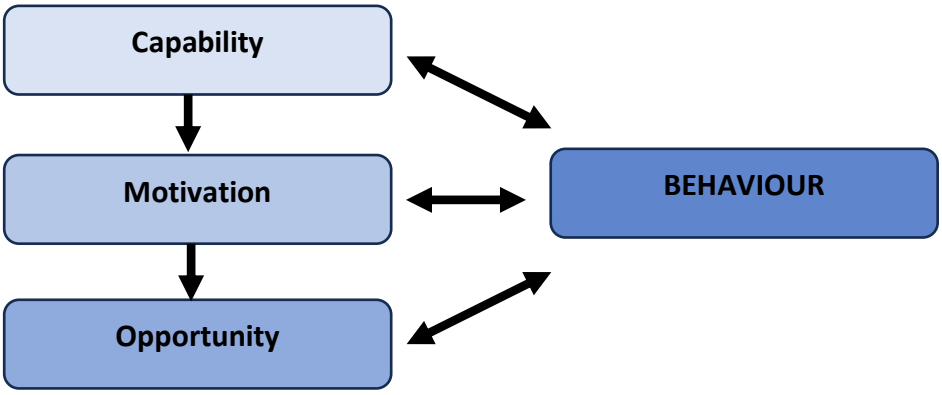


Figure 5.2: "The COM-B system – a framework for understanding behaviour" (Michie et al., 2011, p. 4)



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In 2012, Cane et al. refined the TDF into 14 domains to assist researchers in healthcare to better understand healthcare worker behaviour when implementing evidence-based practice changes, and patient behaviour towards compliance with treatment strategies (Cane et al., 2012). The 14 TDF domains are listed in Table 5.1 and matched to the ward round concepts influenced by staff behaviour, both at the bedside and away from it.

If we bring our ward round insights, the behaviour change wheel and TDF theoretical concepts together, like Bai et al. (2022) we can think about supporting behaviour change that will promote positive relationships within each ward round stream and therefore achieve the desired patient outcomes to promote excellence. By addressing the capabilities, opportunities and motivating factors within the organisation, doctors and nurses could be brought together to create a culture or trusting and respectful relationships. Using three positive behaviour influences from the theoretical domains – memory, attention and decision process; environmental context and resources; and staff beliefs and capabilities – Figures 5.3, 5.4 and 5.5 show us how ward round concepts and the theoretical domains can be used to address capability, opportunity and motivation to promote better ward round structures. This in turn will facilitate more connections between doctors, nurses and the patients, on and off the ward round. For example, leadership within the organisation that supports three nurses being rostered to attend all three streams. creates an environment that improves the culture of trust and respect within the ward round team, providing the capability, opportunity and motivation to attend the ward round. Only three theoretical domains have been addressed in these figures. Table 5.1 reveals that many more domains could be considered to improve the ward round teamwork culture. These include knowledge, skills, social/professional role and identity, beliefs about consequences, reinforcement rewards, intentions, goals, and social influences. Therefore, further attention to these domains would provide a stronger team of doctors and nurses who feel included and are comfortable and confident speaking up within the team, keeping the patient at the centre of decision making and including them in the ward round discussion.

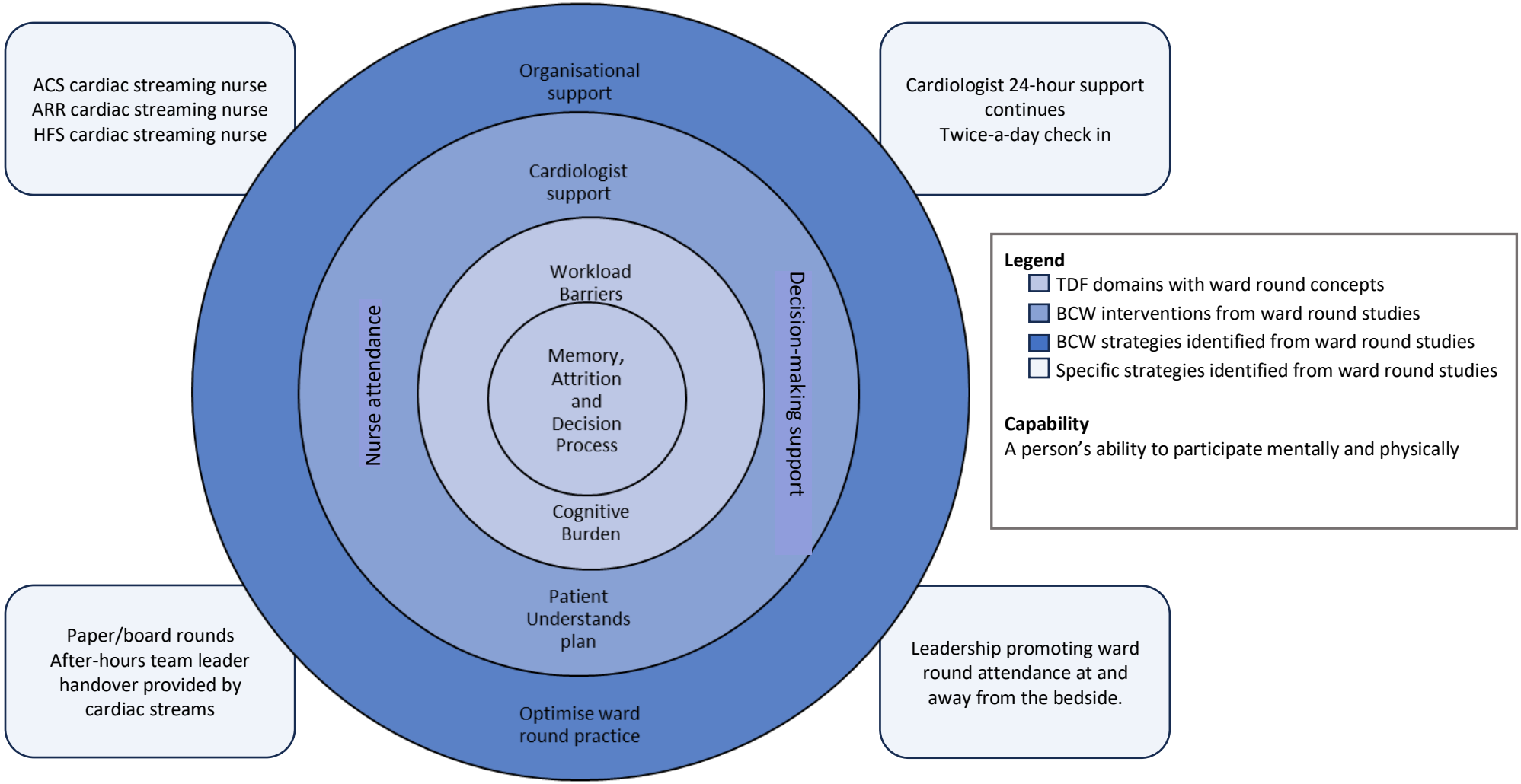
Table 5-1: Refined theoretical domains matched to ward round concepts that influence ward round stream behaviour

Theoretical domain	Refined framework	Ward round concepts
Knowledge	Procedural and condition knowledge Scientific rationale	Senior cardiac expertise for doctors and nurses
Skills	Interpersonal skills	Patient advocacy Patient voice
Social/professional role and identity	Leadership Group identity Organisational commitment	Belonging Inclusion
Beliefs and capabilities	Perceived competence Self-efficacy Empowerment Self-esteem	Expectations of themselves and others Value Confidence in speaking up
Optimism		**
Beliefs about consequences	Attitudes Beliefs Outcome expectations Anticipated regret	Situational awareness Expectations
Reinforcement rewards	Valued Not valued Incentives Punishment and consequences	Situational awareness
Intentions	Stability of intentions Stages of change model Goal setting and priority Certainty	**
Goals	Action planning Priorities Implementation intentions	**

Theoretical domain	Refined framework	Ward round concepts
Memory, attention and decision process	Memory Attention Decision making Cognitive overload	Workload (bed demands, patient flow, clinics, catheterisation laboratory) Cognitive burden Value Belonging
Environmental context and resources	Barriers and facilitators Conflicting demands Organisational culture and climate	Workload barriers Optimised ward round practice Physical, cultural and digital environment One nurse for three ward rounds
Social influences	Group norms Conformity Power Alienation and intergroup conflict Social support	Situational awareness Trusting and respectful relationships Teamwork
Behavioural regulation	Breaking habits Self-monitoring Learning and review	**

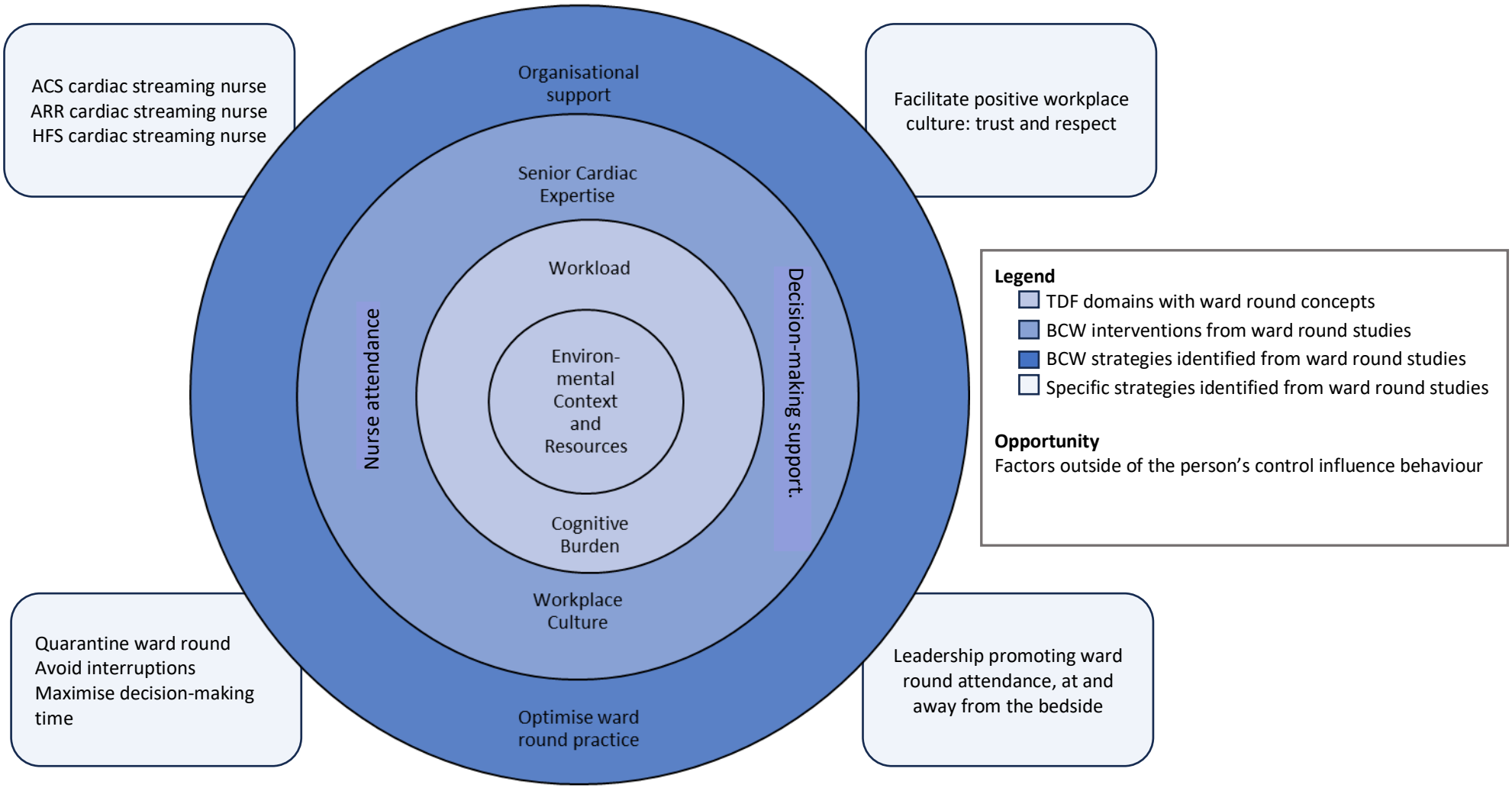
*** Ward round concepts did not fit into these domains*

Figure 5.3: Ward round behaviour change model using behaviour change wheel and theoretical domains framework: Capability



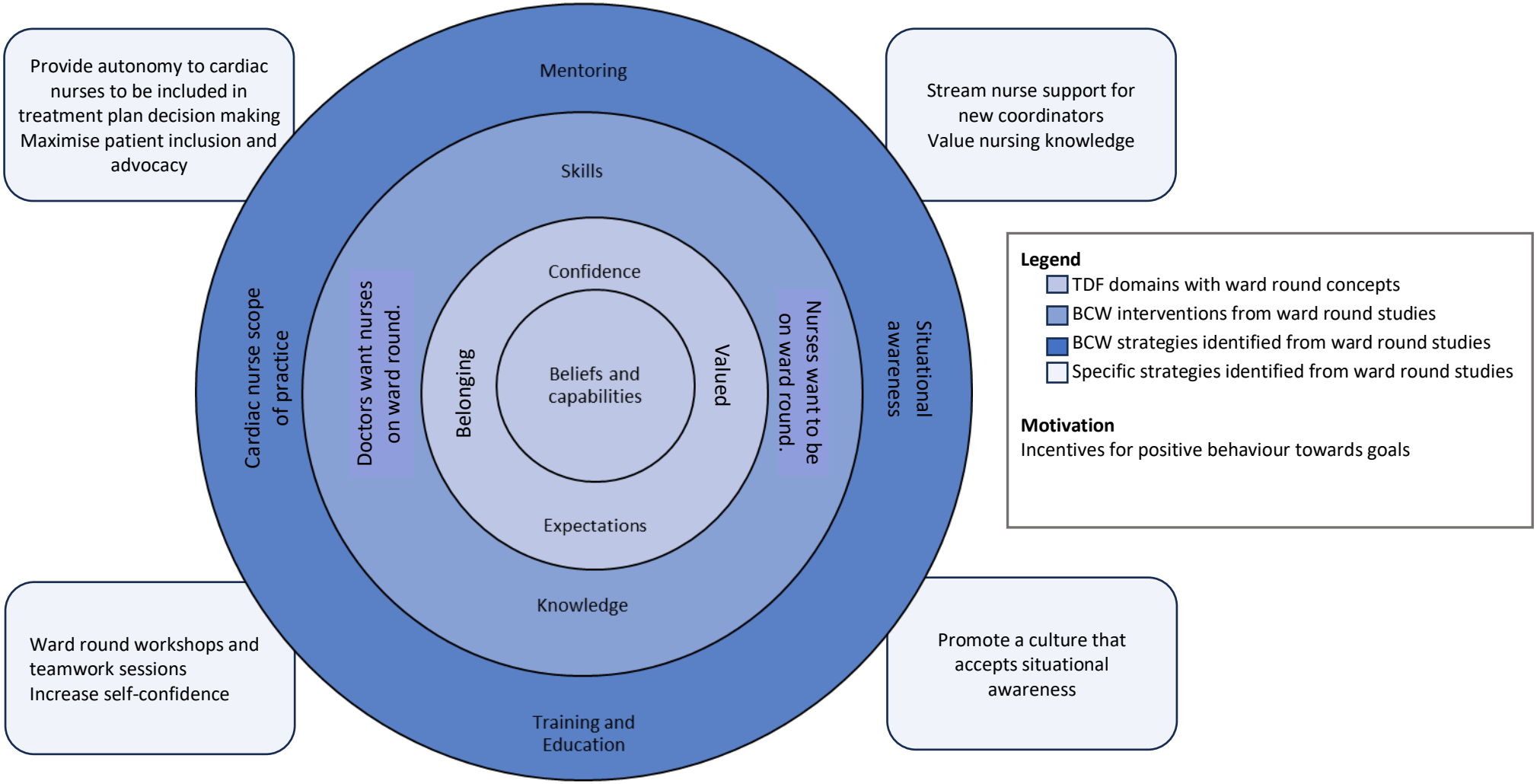
ACS = acute coronary syndrome; ARR = arrhythmia; BCW = behaviour change wheel; HFS = heart failure service; TDF = theoretical domains framework

Figure 5.4: Ward round behaviour change models using behaviour change wheel and theoretical domains framework: Opportunity



ACS = acute coronary syndrome; ARR = arrhythmia; BCW = behaviour change wheel; HFS = heart failure service; TDF = theoretical domains framework

Figure 5.5: Ward round behaviour change models using behaviour change wheel and theoretical domains framework: Motivation



ACS = acute coronary syndrome; ARR = arrhythmia; BCW = behaviour change wheel; HFS = heart failure service; TDF = theoretical domains framework

5.4.3. Scope of practice

RNs develop their decision-making skills as they learn and gain more clinical experience (Benner, 1982). Mentorship, leadership, and further education and clinical experience over time develops the nurse's confidence to make effective decisions (Benner, 1984, 2000). Attending the ward round created more situational awareness opportunities for nurses and their healthcare colleagues. The first ward round study empowered nurses to make effective decisions so that medications were given on time, and patients fasted less, had less bed rest and received more patient education.

Unfortunately, there is no true definition, either within or outside of Australia, of what an RN's scope of practice is. The term is poorly defined and based on local guidelines and healthcare service needs; it depends on the nursing workforce's level of practice in context with their clinical work (Birks et al., 2016). This does not mean that scope of practice does not exist. There are many advanced nursing practice opportunities in the current healthcare system, developed to address the burden of increasing chronic disease, attendance in the emergency department, and demands on hospital beds in both rural and metropolitan areas. The Australian College of Perioperative Nurses (ACORN) have had their professional practice standards endorsed nationwide so that all operating theatres within Australia now comply with the ACORN standards (Sally & Menna, 2018; Williams et al., 2018). Up until recently, Australian cardiac nurse professional practice standards did not exist. The Australasian Cardiovascular Nursing College (ACNC) recently published the first ever Australasian cardiac nurse professional practice standards (version 1). A Delphi process was used by the members of the ACNC, mostly the NSW cohort of members, to produce the standards. The standards address all levels of cardiac nursing practice levels and experience (Colgan et al., 2023). Unfortunately, these standards have not yet been endorsed by the Cardiac Society of Australia and New Zealand (CSANZ) nursing subcommittee, nor are they recognised nationally; however, a review and discussions are underway. Having these standards published and discussed by additional professional bodies of cardiac nurses empowers cardiac nurses to explore their scope of practice and think about future opportunities available to their clinical, research and educational careers.

The Nursing and Midwifery Board of the Australian Health Practitioner Regulation Agency (AHPRA) has published a fact sheet to clarify the scope of practice between nursing groups and midwives (Nursing and Midwifery Board AHPRA, 2022). This document outlines a variety of nursing tasks a nurse can do at each level of qualification – enrolled, registered, nurse practitioner and midwife;

however, this document does not necessarily guide the scope of professional practice that a nurse needs to follow. It is merely a guide for nurses and healthcare institutions to categorise nursing skills. The Nursing and Midwifery Board has also published an advanced nursing practice fact sheet that acknowledges the need for healthcare organisations to recognise the benefits of specialist practice nurses as they have complex decision-making skills at that level of practice (Nursing and Midwifery Board AHPRA, 2020). Ibrahim et al. (2017) implemented practice standards for cardiac nurses when caring for patients with cardiac arrhythmias. Their study showed a significant improvement in the cardiac nurses' performance when using practice standards (Ibrahim et al., 2017). This evidence, along with the work of Colgan et al. (2023) in the ACNC standards, as well as the ACORN standards, does mean that professional nursing bodies do advocate for nurses to address their practice and strive to reach higher standards – a motivation to achieve excellence. If AHPRA and CSANZ promote cardiac nursing standards and acknowledge them as a specialty, more weight will be given to nurses' scope of practice, thus supporting new models of cardiovascular patient care.

5.5. Implications for practice

The aim of this study was to enhance the clinical decision making and communication environment in the CCU. We wanted to find out whether including cardiac nurses on the ward round assisted cardiac doctors and nurses to make evidence-based clinical decisions, to deliver a patient treatment plan that was understood and accepted by the patient and all members of the cardiac streaming team so that patient care was delivered sooner. This was achieved during the three 2-week rotations in the initial ward round study, when we could provide a nurse for each of the stream ward rounds.

We also know from this ward round research that doctors want nurses on the ward round, nurses want to be on the ward round, and patients benefit from improved timely and quality care when nurses attend the ward round. Also, a relationship of trust and respect does exist between senior experienced doctors and nurses, especially between the heart failure nurses and the heart failure stream, as well as between the CCU's senior experienced cardiac-trained nurses and all cardiac streams. But the second study revealed that this culture change cannot be sustained over time if there are no extra nurses available to attend all three ward rounds, and trusting and respectful relationships cannot be built with new cardiac-trained nurses who attend the ward round intermittently. Therefore, according to the previous discussions in this chapter and the results of

this study, cardiac nurse streaming is suggested as a possible practice change that could afford the sustainability of the desired culture change that will build excellence.

5.5.1. Cardiac nurse streaming

This concept for the future is to create a multidisciplinary cardiac stream that includes experienced cardiac-trained nurses. Each stream will have, at a minimum, a cardiologist, a registrar, an RMO and a cardiac nurse. Membership for each stream can consist of the following:

ACS stream: cardiologist, registrar, RMO, intern, cardiac nurse

ARR stream: cardiologist, registrar, RMO, cardiac nurse

HFS stream: cardiologist, registrar, RMO, intern, cardiac nurse

Two to three medical students can be allocated to a cardiac stream at various times throughout the year. This means that 8 to 11 doctors can be coming and going from the unit at any given time, 8am to 5pm, Monday to Friday. The weekend ward round does not require all three cardiac streams. Only one medical team covered by a cardiologist, registrar and an RMO does the ward round on Saturday and Sunday morning, with an after-hours RMO covering all other times. Therefore, doctor presence on weekend mornings drops from up to 11 to 3 doctors during the day. Medical and nursing staff availability for the ward round is illustrated in Appendix 24. Cardiac nurse streaming will add a nurse to the ward round team during weekdays.

The vision for future cardiac nurse streaming emulates the current inpatient and outpatient heart failure nursing roles that work to improve patient outcomes and reduce readmission rates. The close teamwork between heart failure nurses and the heart failure medical stream made a significant difference to the ward round study's primary outcome for the HFS stream compared to the other two cardiac streams. This is likely due to the already proven benefits of delivering multidisciplinary care to heart failure patients (Riley, 2015; Towery Davidson, 2020). Many advanced cardiac nurse specialist roles already exist due to the proven benefits of quality patient care delivery with reduced all-cause mortality rates. Some of these roles include nurses who run nurse-led clinics for cardiac rehabilitation, arrythmias such as AF, chest pain and cardiac surgery, and transplant and pulmonary hypertension nurses. These roles provide opportunities for nurses to lead the way in delivering evidence-based cardiac nursing care (Beleigoli et al., 2021; Ferguson et al., 2020; Gallagher et al., 2019; Gallagher et al., 2020; Harbman, 2014; Hendriks & Lee, 2020; Jaarsma, 2005). These nurses also support inpatient care. The heart failure, pulmonary

hypertension and heart transplant nurses attended the ward round during the intervention. To create this nursing model we would have to ask executive permission to attach the heart failure, pacemaker and EST nurses permanently to each of the three cardiac streams Monday to Friday.

Nurses are valued members of the ward round team; however, the number of available cardiac-trained nurses, who have the necessary specialised training, knowledge, and experience, has reduced as recruitment and retention strategies by healthcare institutions seem lacking. Cardiac nurses are feeling less valued for their specialist nursing insight and surveillance skills, especially as CCU beds are being used for non-cardiac patients due to hospital patient flow pressure (Currey et al., 2019; Walker et al., 2012). The established surveillance skills of experienced specialist nurses have been demonstrated to improve patient outcomes (Giuliano, 2017; Juvé-Udina et al., 2017). Cardiac nurse streaming will give cardiac nurses the opportunity, capability, and motivation to participate in a cardiac stream specialty and assist with patient care decision making. It will promote a sense of belonging to the team and enable relationships of trust and respect to develop, so that a culture of delivering evidence-based practice and excellence will follow. Then patients will have the opportunity, be more capable and have the motivation to be more involved in the decisions made about their treatment plans. Ultimately, workflow and timely delivery of quality patient care by the bedside nurses will improve.

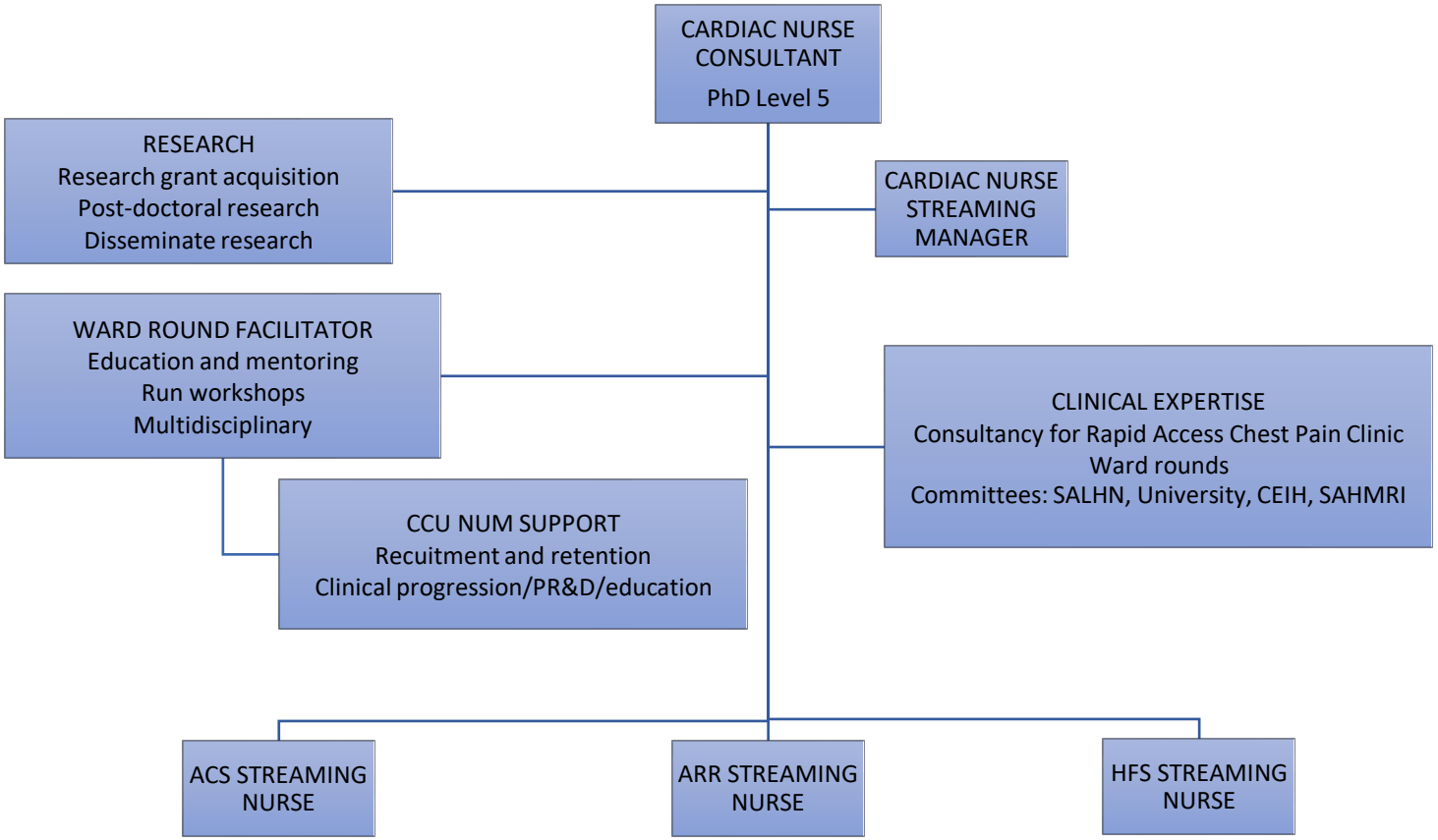
The ward round role of the cardiac streaming nurse does not need to be limited to the snapshot of time when the team visits the patient at the bedside. As shown in the ward round study, a constant cycle of communication is required throughout the day and after hours. The cardiac streaming nurses can extend their scope of practice to be involved with decision making and the communication process, as well as emergency and inpatient assessment, nurse-led clinics, education programs, ongoing research into evidence-based care, and mentorship. Healthcare institutions have the opportunity, capability and motivation to utilise the expertise of many specialist nurses around the nation and overseas. We know that respiratory nurses are another group that feel under-recognised for their contribution to patient outcomes (Halverson et al., 2022; Smith et al., 2022). Cardiovascular nurses, therefore, need to be empowered to make more decisions and influence the patient care journey. This will not only benefit patient care but also assist with mentorship and education, and provide a clinical/research nursing career pathway. Heart failure, arrhythmia and chest pain nursing roles already exist internationally, nationally and within the state. The institution where the ward round study was conducted already has heart failure, exercise stress test and pacemaker nurse roles. These nurses, as well as the transplant,

pulmonary hypertension and cardiac rehabilitation specialist nurses, run their own clinics independently. This means they do not all have a cardiologist or registrar present to support them when they assess and counsel patients or titrate therapies and medications. Healthcare institutions are relying on more nurse-led clinics as they are a proven strategy that reduces readmission rates and contributes to positive patient outcomes (Magdy et al., 2022; McLachlan et al., 2022). The Australian Nursing Federation is now lobbying the government to review nurses' scope of practice and implement more nurse-led clinics (Fedele & Dragon, 2023). Understanding all these factors, it is realistic to expect a redesign of the cardiac nursing model to accommodate ACS, ARR and HFS stream nurses.

Figure 5.6 is a suggestion of how we can embed nursing research into our practice: a joint clinical and research role for nurses, with adequate leadership within the division, that may support a new model of care. This could then deliver a more expert clinical role that keeps the nurse at the bedside and utilises their expertise and mentorship to promote nurses using their enquiring minds and thinking about evidence-based practice. Instead of retiring early, older experienced nurses can be valued for their knowledge and can be used as consultants to educate, mentor and support a dynamic learning and collaborative culture amongst nurses and doctors. The figure shows new nursing models of care for rapid chest pain assessment, AF clinics and cardiac rehabilitation including heart failure rehabilitation. These services have been chosen because they have current cardiac nursing expertise gaps in our hospital, and current active nursing research projects for these topics are underway around the nation. Each cardiac stream nurse is responsible for attending the ward round, delivering patient and staff education, and doing their own research project. This model of care will therefore not only impact practice but can also impact future research studies as we assess the implementation of these initiatives. Such a model provides the flexibility for clinicians to explore and innovate, in a system that trusts their workers and encourages best practice rather than controlling practice through strict protocols (Braithwaite et al., 2020).

The reality is that without the organization providing the motivation, opportunity and capability for nurses to be a part of each of the cardiac streams, than we may not see this model of care come to light.

Figure 5.6: Post-doctoral cardiac nursing model of care



ACS = acute coronary syndrome; ARR = arrhythmia; CCU = cardiac care unit; CEIH = Commission on Excellence and Innovation in Health; HFS = heart failure service; NUM = nurse unit manager; PR&D = performance review and development; SAHMRI = South Australian Health and Medical Research Institute; SALHN = Southern Adelaide Local Health Network

5.5.2. Workforce

Nurse staffing ratios were being renegotiated during the time of the first study. CCU nurses were in discussions with the nurses' union, the Australian Nursing and Midwifery Federation (ANMF); the department of medicine, critical care and cardiac services; and the hospital nursing executive. These negotiations had to go to arbitration and were resolved by June 2021. Nurse ratios were eventually set at 1:3 for 12 out of the 20 CCU patients, 1:4 for the other 8 patients on early shifts and 1:4 on all 20 CCU patients on late shifts. Both the early and late shifts also had a senior cardiac nurse coordinator and clinical support nurse position added to the shift who did not have a patient allocation unless unforeseen circumstances, such as an acute patient deterioration, required specialling by the clinical support nurse. Night duty at that time was reduced from five staff to four, leaving a nurse-to-patient ratio of 1:6 for six out of 20 patients and 1:7 for the 14 other CCU patients. The nurse coordinator did not have a patient allocation.

At the time of the first study, two senior cardiac-trained nurses, practised in advanced life support, were supposed to be allocated to each shift; however, due to attrition rates, low recruitment and COVID sick leave, this was limited to only one senior cardiac-trained nurse per shift. At least one to two junior nursing staff, new graduates and enrolled nurses were also rostered each shift. Unfortunately, there were less permanent transition and progressive CCU nurses available for the roster, which was attempted to be filled with agency and Flinders Medical Centre pool nurses. These were non-cardiac-trained nurses, who didn't have the knowledge or the confidence to mobilise monitored patients, assess, and remove unnecessary oxygen use, provide patient education or even question cardiac medical orders. Appendix 24 shows the change in staffing plans for the CCU before and after the study.

Approximately 15 cardiac-trained CCU nurses have retired or left the CCU to work elsewhere in the past 4 years. There are reduced numbers of cardiac-trained nurses available in the hospital. Attention by the nursing executive to recruiting and retaining cardiac nurses has also been limited. Only four new staff have completed their cardiac nursing graduate diplomas in that time, and they still require a period of experiential learning to consolidate their knowledge. Magnet hospitals are able to motivate staff to remain in their healthcare institutions when they provide them with opportunities to excel at their work and make their staff feel appreciated. Nursing leadership needs to consider our cardiac nursing foundation as a priority if we are to promote cardiac nursing excellence (Calzone et al., 2018; Fischer, 2019).

Currently, the South Australian Statewide Cardiac Care Clinical Network, an initiative run by the Commission on Excellence and Innovation in Health through the Government of South Australia, is examining a variety of models of care to ensure all South Australians receive optimal cardiac care throughout the state. The cardiac nursing subcommittee of the network is reviewing the availability of cardiac nursing expertise around the state, and the current and future state cardiac nursing models of care. This government support is helpful as we continue to ensure our skill mix provides a safe supply of 24-hour cardiac nursing expertise for our cardiac patients (Commission on Excellence and Innovation in Health (CEIH), 2020).

As discussed earlier, cardiac nursing needs to be supported as a nursing specialty within Australia. This will help address negotiations about nurse-to-patient ratios and improve cardiac nurses' scope of practice, including educational support for nurses to improve their clinical and research knowledge and skills. Eventually this may improve capabilities, opportunities, and incentives to create and sustain a cardiac nursing workforce that delivers consistent quality and timely patient care.

5.5.3. CCU activity and bed demands

The CCU at Flinders Medical Centre is a busy acute care facility that has 20 beds. Only 16 of these beds are supposed to operate 24 hours a day, 7 days a week. Four of these beds are for cardiac short stay admissions, that is, an overnight stay for cardiac procedures. During the ward round study, up to six elective cardiac short stay patients were admitted Monday to Friday for overnight stay and same-day procedures. On Tuesdays, two more planned elective transcatheter aortic valve implantation (TAVI) patients were admitted. Depending on bed demand, which was often, all 20 beds flexed up to admit acute cardiac patients 7 days a week, 24 hours a day, from 11 referral points, including the emergency department, See Appendix 22. According to internal bed demand data collected on 16 August 2020, the unit was experiencing a baseline patient turnaround of 30–40% of patients per day, which increased to 70–80% regularly (3–4 times a week, and more often in peak activity times). See Appendix 21. The two exit strategies to create space for emergency cardiac patients were, and still are, discharging patients home or to care facilities, or transferring them to another hospital or ICU, depending on bed availability in the ICU or other health facilities. At the time of the study, the cardiology ward (6DC) beds were prioritised by the bed manager and allocated to emergency department patients with non-COVID respiratory conditions and other general medical patients requiring a cardiac monitor. Therefore, the CCU relied heavily on the ward round discharge decisions to determine bed capacity.

This high bed demand has not changed over the 2 years following the ward round intervention. High workloads and a lack of ward round compliance still exists. CCU beds are still highly sort after, and the hospital is now buying cardiac short stay as well as inpatient cardiac beds in private hospitals to create capacity. This means the cardiac stream ward round is stretched to the private hospital. This adds even more pressure to have a public cardiac nurse on the streams in the CCU to facilitate cardiac rehabilitation, discharge requirements, encourage patient mobility and improve patient flow.

This thesis shows that competing workload pressures are taking the cardiac nurses away from attending the ward round and thus advocating for their patients. That is why we argue the need for the organisation to provide an environment that automatically generates compliance with all of the ward round structures, including the medical staff. Time and resources are required to further support complex decision making in an environment that promotes teamwork, situational awareness and patient inclusion in a busy clinical setting.

5.5.4. Hospital-wide ward round practice

This study showed that a cardiac nurse on the ward round benefits the timely delivery of quality patient care for CCU patients. We have not studied this in other wards, locally, nationally or internationally. That does not mean we cannot ensure cardiac nurses attend the ward round elsewhere. The primary investigator has been approached by the local hospital quality improvement committee to implement this research in other wards, and much interest has been shown in presentations of this work both locally, nationally and internationally. This implies that encouraging and supporting nurses to attend the ward round as a routine practice in other wards and units may be an application of evidence-based practice, as long as the context of each workplace culture is appreciated. Successful acknowledgement of and transition to practice for nursing research outcomes then encourages other nurses to participate and drive other nursing research projects (Braithwaite, 2018; Braithwaite et al., 2020).

5.5.5. Utilising a future analytic framework of the EMR

The EMR has the potential to more accurately capture how well nurses activate quality timely patient care needs. This includes direct and indirect patient care as well as those activities that prove nursing participation and influence in decision making on and off the ward round. These two studies primarily used changes to medication administration delays to reflect the influence of the nurse on the ward round, however, there may be many other opportunities to explore. For

example, discharge planning, patient education, allied health referrals and timely responses to patient deterioration and care, as well as the usual length of stay, readmission and mortality rates. There is also a large amount of background administrative and clinical work that nurses do away from the patient. We need a more sophisticated EMR that can capture these nursing activities as they are often a barrier to attending the ward round.

EMR reports that could capture these data elements as well as patient reported outcomes could show how the nursing workload is taking the nurse away from the ward round and bedside care, thus impacting the delivery of direct patient care and also the delivery of excellence. Developing the EMR as a continuous reporting tool of quality indicators has the potential to indicate workflow issues and how that is affecting the delivery of direct patient care. For example, as shown in Figures 3.2 and 3.3, a high patient turnover of CCU admissions and discharges may show fluctuations in the quality of patient care given to the already admitted patients. It is the nurses, along with the bed managers that operate patient flow in and out of CCU. The EMR will have to become more sophisticated to capture nursing background administrative work and the time taken for them to attend the ward round. Empowering nurses to continually evaluate whilst practicing within a sophisticated routine, embedded in data collection could enhance a culture that continuously reacts appropriately to workflow issues ultimately improving or at least maintaining quality patient outcomes. Patient inclusion

During the ward round, tests, procedures and medications were ordered by medical staff. Nursing staff implemented patient care and treatment according to medical orders, specialised cardiac nursing care plans and basic nursing care requirements. The issue was that a nurse was not consistently on the ward round to advocate for the patient. The patient voice or agency was not consistently acknowledged. Patients may have felt vulnerable and less likely to “make decisions and stand up for their views and beliefs” when surrounded by six or more doctors and medical students. However, in previous ward round studies, the presence of a nurse on the ward round has often been valued because of improved patient involvement, collaboration and quality care (Cole et al., 2014, p. 580). Cardiac-trained nurses have the knowledge to understand and question medical instructions according to individual patient needs (Javaid et al., 2017).

CCU doctors and nurses at different levels of training required senior clinician decision-making support; the leadership of cardiologists and senior cardiac-trained nurses guides practice and quality patient care (Manges et al., 2017; O'Leary et al., 2019). According to the NSQHS Partnering

with Consumers Standard (2020), clinicians must include the patient's thoughts, ideas and consent when treating and caring for them. Nurses must also follow these standards, as well as the code of conduct set out by the Australian Nursing and Midwifery Board (ACSQHC, 2020; Cowin et al., 2019). The ward round is an opportunity for the whole interdisciplinary team to come together at the bedside and discuss treatment options with the patient. Therefore, all members, including the patient, can then make a joint decision about their treatment plan. Nurses are an important part of the ward round team because they advocate for patients and influence quality of care (Lees, 2013; Pucher & Aggarwal, 2015; Pucher et al., 2014). Patients may not have the ability to converse with the healthcare team, ask questions and gain an understanding of their treatment plan. It is the nurse advocate that supports the patient voice, which will influence effective clinical decisions (Redley et al., 2019; Weber, 2007). That is why a cardiac nurse needs to attend the CCU ward round.

5.6. Implications for further research

It is possible that new models of care, such as cardiac nurse streaming, will sustain the benefits of a nurse attending every cardiac ward round. New innovations need to be measured to determine their viability. This is an opportunity for nurses to undertake clinical research whilst delivering care and belonging to a cardiac stream. Co-designing our future ward round practice is a better choice. Co-design has almost become mandatory, as anything that affects patient care needs the input of those receiving that care, the patients. We can now rely on feedback from our patient representatives, who are now commonplace within Australian hospitals, to ensure that patient opinion is included in the models of care we use, and patients are asked "what matters" to them. This is the opportunity to find out about patient experiences and outcomes as we head towards creating a culture that supports clinical excellence (ACSQHC, 2020; Bielinska et al., 2022; Chakraborty et al., 2023; McAllister et al., 2021).

We now know more about why cardiologists were unable to comply with the ward round attendance, and the barriers to communication and collaboration between doctors and nurses. We also better understand team dynamics when experienced nurses attend patient care discussions, both on and off the ward round. There is more ward round research to be done and other aspects of decision making that we can study. New innovations and ideas can be measured, such as:

- The concept of cardiac nurse streaming and nurse-led care
- The impact of using a doctor/nurse mobile phone app to improve information transfer
- The impact of understanding patient suffering on decision making
- Effect of the clinical nurse researcher career pathway on recruitment and retention.

Empowering cardiac nurses to influence patient care and clinical decisions by belonging to the ward round team is a practice change that this thesis is promoting. It is one way of freeing up nurses to be more involved and build our nursing practice and thus a centre of excellence.

Whilst information transmission is important, this thesis argues that communication and collaboration between the stream team members needs to be inclusive with a culture of trust and respect that honours everyone's opinion. Merely sending messages through the mobile phone, may be helpful, but does not facilitate this culture meaning doctors and nurses need to be mindful to sometimes step away from online technology and speak personally with the team. That is why two further face to face huddles, including the end of the day is deemed as an important structural component to any future ward round studies to keep the heart and mind within the effective decision-making framework.

To even more connect our hearts and minds to effective decision making we need to consider patient suffering. As humans we are connected emotionally to the care of our patients and we do not want to see them suffer, however, how do we know they are suffering? This is food for thought if we want to improve our patient outcomes and truly address what matters to the patient when making complex clinical decisions and could influence the design of future ward round studies.

Nursing research at a clinical level is at its infancy in South Australia. Nurses are asked to use evidence-based practice in all the things they do, but rarely have an opportunity to do their own bedside research. It is difficult for nurses to find the time or the funding for such endeavours. The cardiac nurse researcher writing this thesis is setting an example to other cardiac nurses and a clinical nursing research career path is starting to emerge. There is much more work to recruit and retain future nurse researchers, but if supported by the organisation, there may be more future opportunities that will influence how nurses practice at the bedside.

The following is a discussion about concepts and methodologies that can be used in future to ensure we are translating our research, by incorporating evidence-based practice into our

everyday patient care. Using other theories that gain traction with our leadership and executive groups might provide higher stakeholder support. Cardiac nurses belonging to a cardiac stream may improve team relationships and therefore workplace culture. This could help achieve professional behaviour change to ensure we maintain the benefits of new models of care. Translational research, organisational change theory and professional behaviour change could be used in future ward round research and will be discussed in context with our research findings.

5.6.1. Translational research

Translational research in health, by definition, covers three major aspects:

- Discoveries that instigate the study in humans, which is patient focused to improve public health
- Implementing best practice into the community, which creates better standards of care
- The cost-effectiveness of preventative healthcare and the treatment of patients, which is a strong method of enquiry that inspires more healthcare research (Rubio et al., 2010).

These are all goals that can be achieved by influencing doctors and nurses to communicate and collaborate so that effective decisions can deliver more timely and quality patient care. This requires a culture of trust and respect between the professions. Their behaviour, interactions and ongoing ability to sustain this culture of excellence is the basis for this research. It will likely take more than a short-term study to change the behaviour of the cardiology staff. Finding a sustainable way to maintain a good culture that supports effective decisions is a common challenge felt by many organisations that implement new models of care, technology and evidence-based practice (Dombrowski et al., 2016).

Dombrowski's review of interventions for sustained behaviour change among healthcare professionals included work done with Kwasnicka et al. (2016) to find theories that influenced people changing their poor health habits and maintaining a healthier lifestyle. Together they examined these behaviour theories in a systematic review and discovered a variety of factors that influence both the behaviour change and sustainability of that change. They also stated that the understanding of these theories can influence the design of interventions that will promote the required behaviour. Five theoretical themes were obtained from their review: maintenance motives, self-regulation, resources, habit, and environmental and social influences (Kwasnicka et al., 2016). This work can also be applied within a hospital to promote healthcare professional

behaviour that achieves improved service delivery. Understanding the significance of nurses, human interaction and behaviour change binds this knowledge together.

5.6.2. Organisational change theory and group development theory

As mentioned before, the hospital, does not support nurses attending the ward round. There are no policies about ward rounds in this hospital for the Cardiac Care Unit to follow. There are only policies and procedures regarding comprehensive care and communicating for safety, which address some of concepts, (Australian Commission on safety and quality in health care, 2020). If cardiac nurse streaming is to occur, the organisation must ensure the motivation, opportunity and capability to include an experienced cardiac nurse in each of the three cardiac streams. Therefore, alternative change theory concepts are required for future ward round studies that ensure nurses attend the ward round.

A future conceptual framework could incorporate organisational change theory and group development theory, along with TDF domains (Atkins et al., 2017; Bull et al., 2019; Cane et al., 2012). The intervention used in our ward round study required healthcare professionals to alter their ward round and communication practices at the local level in the CCU, thus impacting clinical decision making. However, practice that does not appreciate a team approach but relies on individual silo patient work-up can negatively impact clinical decision making and cause harm to the patient when investigations cardiac drugs and procedures. are missed (Davis et al., 2019). It is the vigilant nurse that reminds medical staff about missed patient work-up and treatment items, through experience, knowledge, and system protocols and guidelines. The organisation's safety programs ensure these protocols and guidelines are up to date and applicable to current practice. Successful change occurs when stakeholders are also involved in developing these new protocols and processes put in place to improve and excel in clinical healthcare practice (Adeyemi, 2017).

Organisational change theory is used by managers and leaders, the driving force of change, to empower their teams to innovate and bring forth their own ideas (Bracher et al., 2019). There is a dynamic process of engaging with the organisation's culture and gaining a better understanding of why staff are struggling with the intervention. The organisation's perspective provides solutions to help move the project forward (Andrews et al., 2008). Another theory to consider is "the team phase change theory" (Benfield & Utley, 2007). This theory focuses on behaviour in people when they interact as a group (Tuckman, 2001). It can be applied to staff behaviour, performance and how they develop as a workgroup. Originally explained by Tuckman in 1965, group development

theory has four stages that team members progress through to accommodate an episode of change (Tuckman, 2001). These are forming, storming, norming and performing.

For team members to feel they belong to the workgroup and trust each other, they need to progress through a "process of team development" (Yang, 2014, p. 858). In cardiology and CCU, medical team members change frequently. The cardiac streams change cardiologists every week; registrars, RMOs and interns rotate every 4 weeks; and RMOs and interns rotate through the discipline every 12 weeks. Registrars cycle through cardiology and CCU every 2 to 3 years. Nursing staff mostly remain in the department as permanent members, some for 10 to over 20 years, so are more stable members of the CCU healthcare team. The constant rotation of medical staff creates frustration amongst the nursing staff as they need to continually form new relationships. The attrition of senior and permanent nursing staff has seen an increase in relieving nurses working in the unit. This again requires the formation and renewal of relationships with non-cardiac-trained nurses on a shift-by-shift basis. New permanent cardiac nurses have been employed to fill the gap, which has meant new team introductions and formation of new workplace relationships.

Trust is an important requirement for a team to function effectively, even if building that trust may need to occur on a shift-by-shift basis in the CCU. Because the cardiac stream membership frequently changes, doctors and nurses need to adapt quickly to maintain quality patient care. Trust is a major influence of team performance and the concept of "swift trust" allows for the rapid development of newly formed relationships within a workgroup (Yang, 2014, p. 859). Positive relationships and trust between doctors and nurses can form quickly when the foundation has been set by the organisation and its team leaders. This is especially true in healthcare because doctors and nurses share a common goal: "delivering quality patient care". They have expectations amongst their professional disciplines to deliver that care, and know they must follow policy, guidelines and good principles of care. Fostering a collaborative culture enables this initial trust to develop and deepen, especially when healthcare team relationships are based on honesty, kindness and compassion; this collaborative culture in turn contributes to safety culture (Cartland et al., 2022; Yang, 2014).

Another important contributor to team success is a sense of belonging (Gwandure & Boshoff, 2019). When cardiac nurses were not allocated to a cardiac stream, the cardiologist and/or registrar interchanged leadership and needed to be more engaged with the ward round members

daily. If the cardiac stream is going through a daily or weekly change in team members, it is difficult for the team to develop and cope with changes to workflow as they do not have enough time to move through Tuckman's four group development stages before terminating the group on the next rotation (Gwandure & Boshoff, 2019). Therefore, it is important to consider that innovating and implementing new work, treatments or policies may create resistance to change and compliance issues. We need to consider how this affects professional behaviour.

5.6.3. Professional behaviour change

A combination of organisational change theory and team change theory helps to understand professional healthcare staff behaviour (Benfield & Utley, 2007; Ford, 2006). Kitson (2009) argues that implementing changes to practice is very complex, and needs to be people and context focused to ensure the change process succeeds (Kitson, 2009). This means that although behaviour of the team is important, external and internal factors can influence staff behaviour and therefore culture. For example, during the ward round study, even though the CCU preferred the cardiac stream to see the sickest CCU patients and discharges first, the hospital needed them to see the cardiac emergency department patients first. This was due to pressure on access to hospital beds. CCU patients could not be prioritised. Such pressure included emergency department overcrowding and ambulance ramping causing a high demand for hospital bed space. The organisation determined the priority of care and decision making. Since 2019, in Flinders Medical Centre, bed management is higher on the priority list for nurse unit managers and senior nurses than attending the ward round, helping with patient care decisions and influencing direct patient care. The bed space has become more valuable than the patient in the bed as dashboards throughout the local health networks were driving hospital executive analytics. After all, as promoted by Reichert and Furlong (2014), a data driven culture is the most important fifth pillar that will transform organisations (Reichert & Furlong, 2014). Unfortunately, these dashboards are not available to the doctors and nurses delivering patient care. There are no dashboards that show efficiencies in delivering that care either. Maybe this research can make patient care efficiency more transparent to promote behaviour that will deliver quality patient care sooner. Providing all the care necessary for our cardiac patients, and thus gaining efficiencies, may make CCU beds available sooner. Leadership is required to convince, guide and motivate staff to achieve these goals.

Adequate leadership within the organisation can ensure that staff follow the same goals and priorities as set out by the institution. It is a matter of empowering decision making throughout the organisation so that, even at the bedside, staff are adhering to the global goals, creating unity within the team and achieving successful outcomes. Acknowledging and legitimising each person's contribution to the implementation of these goals or interventions will foster learning and the ability to sustain these practice changes (Ford, 2006). The challenge is to ensure the whole team adheres to these changes because, in reality, someone will always resist change.

5.7. Conclusion

Although this is a small study that was applied to one 20-bed CCU, by a clinical nurse PhD candidate working in that unit, we did manage to discover that nurses do make a difference to ward round treatment plan clinical decisions so that patients receive their care sooner. We found that a workplace culture that supports situational awareness through trusting and respectful relationships encourages the delivery of quality, timely patient care.

Limitations exist in this research due to the potential bias of the primary investigator, the small cohort, and timeframe and design of this study, but strengths lie in the willingness of doctors and nurses that participated in the study and the already collegial workplace culture that existed between them. Results promote more nursing presence on the ward round and better opportunities for communication and collaboration among doctors and nurses. Therefore, cardiac nurse streaming is proposed as a viable option that will solve the lack of nurses attending the ward round, at and away from the bedside, as well as extending the role of cardiac stream nurses to work to their full scope of practice and stimulate nursing research. This is then how we support an environment of continual evidence-based practice. Beyond this research, more studies need to be done to prove that cardiac streaming nurse roles improve inpatient care, reduce readmission rates through outpatient care, and provide the capability, opportunity, and motivation for hospitals to recruit and retain cardiac-trained nurses.

In summary, this thesis is about nurses learning and participating in nursing research to provide evidence-based care that recognises the value of cardiac nurses and how they influence the workplace culture to promote quality patient care. By acknowledging cardiac nurses' contribution to patient care discussions with doctors and patients, we can appreciate their ability to create excellence. Patients need Nurses On the Ward round – NOW.

APPENDICES

Appendix 1: Outcomes from this thesis

Date	Author	Type	Venue/Activity	Topic	Result
9 Sep 2020	A Lymn	Presentation	DocFest: Flinders University	Clinical nurse researcher role	
Jan 2021	A Lymn	Online – GEMS	Ethics submission	Ward round study	
Feb 2021	A Lymn	Meeting/online	Ethics re-submission	Ward round study	
Mar 2021	A Lymn	Meeting/online	Ethics re-submission	Ward round study	
Apr 2021	A Lymn	Online	Ethics approval	Ward round study	Approval
Mar 2021	A Lymn	Presentation	Flinders Medical Centre (FMC) Cardiology Grand Round	Ward round study: implementation talk	
25 Oct 2021	A Lymn	Presentation	Flinders University	Confirmation of candidature	
1 Nov 2021	A Lymn	Presentation	Australasian Cardiovascular Nursing College (ACNC) presentation: National via teams	Workforce in cardiac care units: FMC perspective	
Mar 2021	A Lymn	Presentation	FMC Cardiology Grand Round	Ward round study: implementation talk	
May 2022	A Lymn, R Clarke, K Lambrakis, D Chew	Abstract	Cardiac Society of Australia and New Zealand (CSANZ)	Re-engineering the cardiology ward round to improve efficiency in care	Accepted for poster prize session
May 2022	A Lymn, R Clarke, K Lambrakis, D Chew	Abstract	Australasian Cardiovascular Health and Rehabilitation Association (ACRA)	Re-engineering the cardiology ward round to improve the delivery of cardiac rehabilitation	Accepted for presentation
Jun 2022	A Lymn	Online – GEMS	Ethics registration	Quality of life study	

Date	Author	Type	Venue/Activity	Topic	Result
Jun 2022	A Lymn	Presentation	South Australian Health and Medical Research Institute (SAHMRI)	3 Minute Thesis (3MT) presentation practice	
Jun 2022	A Lymn, R Clarke, K Lambrakis, D Chew	Abstract	Southern Adelaide Local Health Network (SALHN) Research Week	Re-engineering the cardiology ward round to improve efficiency in care	Accepted for presentation at the SALHN research week
5 Jul 2022	A Lymn	Presentation	Flinders University	Mid-candidature review	
22 Jul 2022	A Lymn	Presentation	FMC Cardiology Grand Round	Ward round study: results	
10 Aug 2022	A Lymn	Presentation	ACRA National Conference	Re-engineering the cardiology ward round to improve the delivery of cardiac rehabilitation	
12 Aug 2022	A Lymn, R Clarke, K Lambrakis, D Chew	Poster prize session	CSANZ National Conference	Re-engineering the cardiology ward round to improve efficiency in care	Nursing new investigator poster prize finalist
5 Aug 2022	A Lymn	Presentation	3MT competition: Heat 1	Re-engineering the cardiac ward round to improve efficiency in care: A nurse in the room	2nd
26 Aug 2022	A Lymn	Presentation	3MT competition: University semi-final	A nurse in the room	2nd
Aug 2022	A Lymn	Proposal	SA Premier Scholarship	$10,000 to attend the International Council of Nurses (ICN) Congress in Montreal, Canada, 1–5 July 2023	Short-listed: unsuccessful
Aug 2022	A Lymn, R Clarke, K Lambrakis, D Chew	Abstract	SAHMRI Research Showcase	Re-engineering the cardiology ward round to improve efficiency in care	Accepted for 3MT presentation

Date	Author	Type	Venue/Activity	Topic	Result
Aug 2022	A Lymn, R Clarke, K Lambrakis, D Chew	Abstract	SAHMRI Cardiovascular Research Showcase	Re-engineering the cardiology ward round to improve efficiency in care	Accepted for poster
9 Sep 2022	A Lymn	Presentation	3MT competition: University final	Re-engineering the cardiology ward round to improve efficiency in care: A nurse in the room	Placed in top 5
28 Sep 2022	A Lymn	Presentation	SALHN Research Week: Free paper prize session	Re-engineering the cardiology ward round to improve efficiency in care	
Oct 2022	A Lymn	Online-GEMS	Ethics submission	Quality of life study	Await meeting 14 Nov 2022 Cancelled due to delays, consider study for post-doc
Oct 2022	A Lymn	Online-GEMS	Amendment to previous study	Ward round study: observation and staff interviews	
9 Oct 2022	A Lymn A Nuske	Presentation	Flinders University HDR (Higher Degree by Research) Week	3MT Finalist tips for success with Anita Lymn and Alison Nuske	
19 Oct 2022	A Lymn	Presentation	College of Nursing and Health Sciences, Flinders University: Research Q and A development meeting – 3MT presentation	Re-engineering the cardiology ward round to improve efficiency in care: A nurse in the room	
28 Oct 2022	A Lymn	Poster prize session	SAHMRI Cardiovascular Showcase	Re-engineering the cardiac ward round to improve efficiency in care	
16 Nov 2022	A Lymn	Presentation	SAHMRI Research Showcase 3MT competition	A nurse in the room	unplaced
9 Jan 2023	A Lymn	Online	Ethics amendment approval	Study 2 – Follow-up ward round study: Re-engineering the cardiology ward round to improve efficiency in care sustainability 1 year and beyond	Plan data collection

Date	Author	Type	Venue/Activity	Topic	Result
24 Jan 2023	A Lymn, R Clarke, K Lambrakis, D Chew	Abstract	European Society of Cardiology, ACNAP 2023 (Annual Congress of the Association of Cardiovascular Nursing and Allied Professions)	Re-engineering the cardiology ward round to improve efficiency in care	Accepted for moderator poster presentation
4 Feb 2023	A Lymn, R Clarke, K Lambrakis, D Chew	Abstract	ACNC Symposium	Re-engineering the cardiology ward round to improve efficiency in care	Accepted for poster
24 Feb 2023	A Lymn	Presentation	FMC Cardiology Grand Round	Clinical practice PhD	
31 Mar 2023	A Lymn, R Clarke, K Lambrakis, D Chew	Poster	ACNC Symposium	Re-engineering the cardiology ward round to improve efficiency in care	
31 Mar 2023–1 Apr 2023	A Lymn	Board of Directors organising committee	ACNC Symposium	Chairperson, timekeeper, IT support, liaison	100 symposium attendees Resubmitted and accepted to the Board of Directors for the ACNC
1 Apr 2023	A Lymn	Presentation	ACNC symposium	Workshop: ECGs in acute coronary syndrome/case studies	
May 2023	A Lymn	Travel grant application	Flinders University	International conference attendance: ACNAP 2023	Successful application for an overseas conference travel grant: $3800
May 2023	A Lymn	Registration grant application	European Society of Cardiology	International conference attendance: ACNAP 2023	Successful application for registration payment by the ESC: $535.00

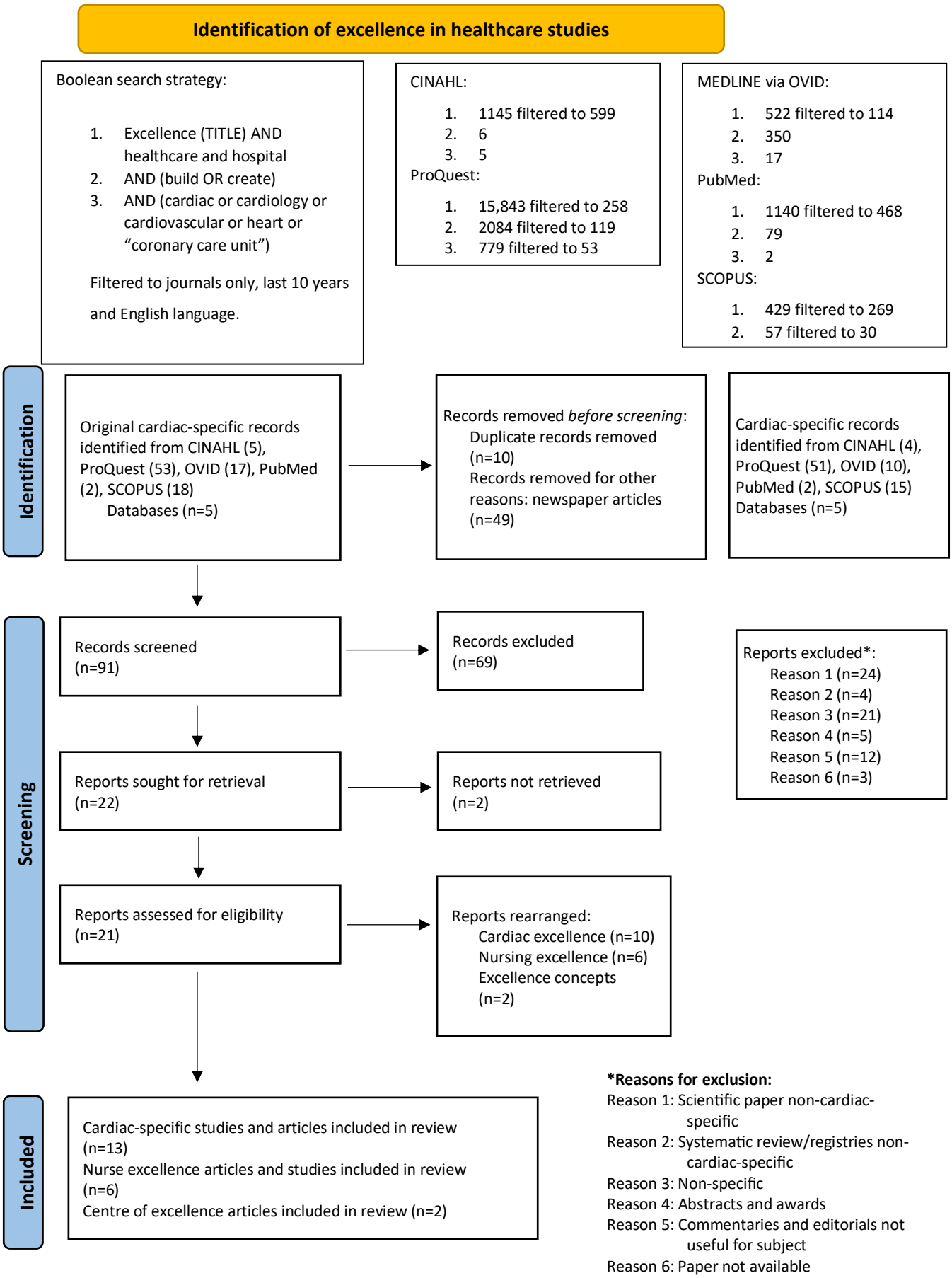
Date	Author	Type	Venue/Activity	Topic	Result
Jun 2023	A Lymn (Principle lead), R Clark, C Astley, R Tavella, C Wilksh, P King, M Ludlow, E Tredrea, J Hendriks	Medical Research Future Fund (MRFF) expression of interest: Catalyst Grant Scheme application	Health Translation SA and MRFF	Grant to support implementing statewide cardiac rehabilitation program for South Australia	Unsuccessful
24 Jun 2023	A Lymn, R Clarke, K Lambrakis, D Chew	Moderator, presentation, poster prize session	European Society of Cardiology, ACNAP 2023	Re-engineering the cardiology ward round to improve efficiency in care	unplaced
5 Oct 2023	A Lymn	Presentation	Rostrum, invited speaker	Bowen Oliver Oration: SAHMRI Lifelong Health	3MT and discussion
6 Oct 2023	A Lymn, R Clarke, K Lambrakis, D Chew	Journal article	European Journal of Cardiovascular Nursing, request to publish	Patients need us NOW (Nurses On the Ward round): Investigating the impact on patient outcomes when cardiac nurses attend the cardiac unit ward round; future implications	Article with graphic abstract to be submitted early 2024
10 Nov 2023	A Lymn	Presentation	Flinders Medical Centre (FMC) Cardiology Grand Round	Patients need us NOW (Nurses On the Ward round): Future implications for Flinders Medical Centre	Attended by cardiology department including head of department, SALHN CEO and SALHN Executive Director of Nursing.

Appendix 2: Excellence in healthcare – search strategy and PRISMA flowchart

Search strategy

Keywords	Boolean phrases	Databases	MeSH terms	Inclusion criteria	Exclusion criteria
Multidisciplinary care team Quality healthcare Cardiovascular diseases Collaboration Teamwork Excellence Centre of excellence Quality improvement Change management Healthcare delivery Nurse Healthcare Cardiology Patient care standards Patient outcome	**Search 1. Excellence in healthcare and cardiovascular care** Excellence (Title) AND healthcare Centre of excellence (Title) AND healthcare and hospital AND build or create AND cardiac or cardiovascular or cardiology or heart or "coronary care unit" **Search 2. Excellence in hospitals** Excellence (Title) AND healthcare AND centre of excellence (Title) AND hospital AND build or create	CINAHL ProQuest OVID (MEDLINE) PubMed	Multidisciplinary care team, healthcare delivery, integrated healthcare delivery, outcomes (healthcare), healthcare errors, healthcare costs, healthcare reform, adverse healthcare event, tertiary healthcare, secondary healthcare, quality of health care	Last 10 years (2013–2023) Academic journals only English only	Older than 10 years Non-English languages

PRISMA flowchart



***Reasons for exclusion:**

Reason 1: Scientific paper non-cardiac-specific
Reason 2: Systematic review/registries non-cardiac-specific
Reason 3: Non-specific
Reason 4: Abstracts and awards
Reason 5: Commentaries and editorials not useful for subject
Reason 6: Paper not available

Appendix 3: Cardiac excellence articles

No.	Author, year Country	Title	Contribution to excellence
1	Bartolowits, 2018 USA	Operational excellence in the CTSICU (Cardiac/Trauma Surgical Intensive Care Unit)	Transformational change based on organisational leadership that empowers staff, particularly bedside care nurses, to participate in the lean thinking program that improved quality and safety of patient care in the cardiothoracic unit.
2	Burnier et al., 2021 European Union	Hypertension healthcare professional beliefs and behaviour regarding patient medication adherence: a survey conducted among European Society of Hypertension Centres of Excellence	Organisational culture and leadership promotes patient-centred care and how we listen to the patient voice.
3	Daming et al., 2021 USA	Creating a maternal cardiac centre of excellence: a call to action	Patient-centred care and improved communication and collaboration between teams reduces maternal morbidity and mortality in the care of complex pregnancies with cardiovascular disease. The organisation needs to provide the leadership and support to ensure this innovative culture change remains. Nurses are required to advocate for the patient and ensure they are receiving the correct care.
4	Kouchoukos, 2016 USA	What is a cardiothoracic surgical “center of excellence”?	Need for clinical evidence to support a reputation for excellence.
5	Lauck et al., 2016 Canada	Nursing leadership of the transcatheter aortic valve implantation Heart Team: supporting innovation, excellence, and sustainability	Importance of including highly trained expert cardiac nurses to provide leadership and support in the delivery of patient care.
6	Nakov et al., 2020 Bulgaria	Transthyretin amyloidosis: testing strategies and model for centre of excellence support	Components to create excellence in diagnosing rare diseases include education and training, multidisciplinary approach, patient-centred, accurate and quality testing.
7	Sandhu et al., 2022 USA	Heart Rhythm Society Atrial Fibrillation Centres of Excellence Study: a survey analysis of stakeholder practices, needs, and barriers	Research is required to understand patient needs etc. to improve patient care. It is quality patient care that determines the level of excellence.

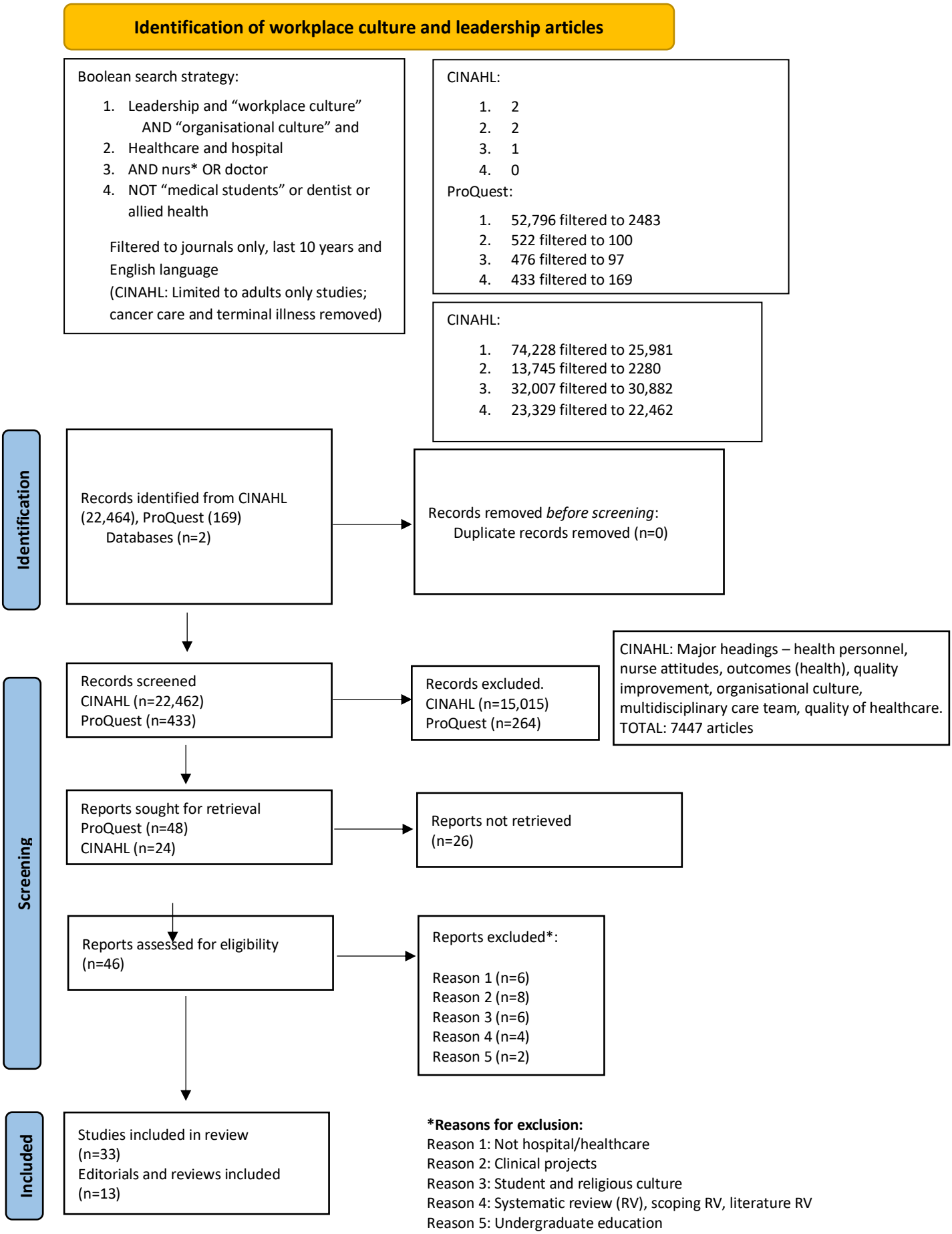
No.	Author, year Country	Title	Contribution to excellence
8	Swaminath et al., 2015 USA	Building a dashboard for a cardiovascular centre of excellence	Identify key performance indicators that will reflect outcome achievements that can be considered an achievement of excellence.
9	Thomas et al., 2021 USA	Cardiometabolic center of excellence: a novel care delivery model for secondary prevention of cardiovascular disease in type 2 diabetes	Patient-centred care with improved collaboration between healthcare teams is required. Advanced nurses who understand clinical guidelines are the “key” to successfully creating excellence as they navigate and bring the whole model of care together.
10	Tzeis et al., 2022 European Union and UK	EHRA certification: a 15-year journey of attesting excellence in arrhythmia healthcare	Using a standard certification program to measure ability of clinicians to care for electrophysiology and cardiac rhythm devices at an accredited high level of excellence.

Appendix 4: Leadership and workplace culture – search strategy and PRISMA flowchart

Search strategy

Keywords	Boolean phrases	Databases	MeSH terms	Inclusion criteria	Exclusion criteria
Leadership Workplace culture Organisational culture Healthcare Hospital Nurse Doctor	**Search 3. Culture and leadership** (leadership and workplace culture) AND organisational culture AND (healthcare and hospital) AND (nurs* OR doctor) NOT (medical students or dentist or allied health) (leadership and workplace culture) AND organisational culture OR (healthcare and hospital) OR (nurs* OR doctor) NOT (medical students or dentist or allied health)	ProQuest CINAHL	Organisational culture, theory and change, leadership, nursing management, healthcare errors, multidisciplinary care team, organisational culture, Magnet hospitals, nursing staff, hospital, nurse physician relations, health personnel, hospital units, health care costs, multidisciplinary care team, quality of health care, quality improvement	Last 10 years (2013–2023) Academic journals only English only (Adults only for CINAHL)	Older than 10 years Non-English languages

PRISMA flowchart



Appendix 5: Screening for leadership and workplace culture articles

Article	Removed reason	Kept reason
Alwazzan, 2016; Saudi Arabia	Medical education	
Ayisha UK		Leadership, effective team building, culture and skill development to improve quality care and outcomes
Carpes, 2023; Brazil		Ethical climate and relationships between healthcare professionals provide better care
Diederich USA		Heart failure multidisciplinary teams optimise medication usage and clinical outcomes
Filipova, 2023; USA		Staff exhaustion requires organisational support and leadership development programs to reduce exhaustion Workplace bullying and role overload etc.
Jiang, 2023; Singapore	Non-verbal rapport + communication needs more research	
King, 2023 USA		Nurse-led rounds in intensive care unit with nurse using a paper-based checklist proved nurse can reliably assess correct bundle elements
Litzelman, 2023; USA	Electronic medical record flowsheet to improve falls risk	
Moyce, 2023; USA	Using PDSA (Plan-Do-Study-Act) cycle to improve outcomes	
Pratt, 2023; USA		Lowering of organisation safety though demanding more of nurses
Steward, 2023; UK		Increase trust through huddles Improved trust between teams impacts workplace culture
Van Dalen, 2023; European Union		Situational awareness in occupational therapy improves safety
Zeb, 2023; Pakistan		Identifying “Demonstrating professional humility and overcoming patient care issues at hand” Limited organisational support for nurses and doctors in the pandemic did not stop them prioritising patient and family needs despite management conflicts
Bone, 2015; Australia	Workplace health and wellbeing model is required Research limitations	
Brook, 2019; UK	Improving health visitor qualifications	
Barrat 2018 UK		Developing resilience: nurses etc. Emotional labour of nurses, Schwartz rounds and leadership in ensuring a positive workplace culture exists between workforce members to allow individuals to improve their own resilience in a supportive environment

Article	Removed reason	Kept reason
Braithwaite, 2018 Australia		Improving performance, change management, systems management, need evidence, new technology and progress, new models of care Need enablers, improved learning, patient-centred care with empowering decision making, e.g. Australia early warning system
Braithwaite, 2016 Australia		Systematic review on workplace culture and patient outcomes Good for definitions
Breach, 2018 UK	Cultural and religious family beliefs	
Capper, 2021; Australia	Student culture	
Cartland, 2022; USA		Education supported by leadership and organisation
Christie, 2021 Australia		Need organisational support for the correct environment to implement and sustain practice Need research and evidence as well
Churruca, 2021; Australia	Systematic review	
Conroy Australia		Patient safety through nurse–patient relationships supported by organisation and environment
Dawes, 2022; Australia		Need leadership skills and education on how to lead
Donegan, 2021 Ireland	Project work; Aged care	
Ekpenyong, 2021; UK		Fear of speaking out
El Miedany, 2023; Egypt	Project work; Bone health	
Emeka, 2020; Nigeria		Staff turnover
Erasmus, 2017; South Africa		Translating into practice with organisational culture and trust
Hernan, 2006; Australia	Primary care	
Hooper, 2015; UK		Junior doctors reporting safety concerns
James, 2018; Australia	Work health and safety	
Kendrik, 2022; Australia		Clinical staff perception of management affects performance
Khrias, 2023; Jordan		Missed nursing care due to lack of organisational support and perception of accountability due to higher patient ratios during COVID plus nurses wanting to leave
Kunkel, 2023; USA	Nursing home care	
Kuo, 2013; USA	Literature review: Surgical safety programs	

Article	Removed reason	Kept reason
Kynoch, 2022; Australia	Scoping review for PROMS (patient-reported outcome measures) and PREMS (patient-reported experience measures)	
Lal, 2022; India	Non-healthcare: Work culture – increasing safety culture including wellbeing	
Manley, 2019; UK		Safety culture: microanalysis of culture and how to improve capability and leadership in teams Need person-centred relationships and promote learning
Martin, 2014; European Union		Supporting nurse leaders to create strategic direction for employees
McCance, 2013; Ireland		Nurses to understand patient-centred care, transformational practice model
Middleton, 2013; Australia	Allied health excluded	
Middleton, 2013; Australia	Undergraduate education	
Middleton, 2022; Australia		Need leadership and organisational support to help graduate nurses to adapt to working life and have resilience
Musto, 2015 Canada/Australia		Moral distress can be reduced by improved teamwork, communication and collaboration, and situational awareness opportunities
Nair, 2023; Sri Lanka	Primary health care	
Nosrati, 2013; Australia	Systematic literature review	
O'Leary, 2016; USA		Clinical microsystem redesign to improve teamwork and patient safety including multidisciplinary team rounds
Olsefer, 2023; Brazil		Need management to support a patient safety culture
Osei-Nimo, 2017; Australia/European Union	Alcohol use in work environment	
Read, 2013; UK	Stroke patients informing staff training	
Rees, 2017; New Zealand		Lean thinking as an option for improved healthcare environment and service delivery
Rice, 2017; Australia		Create positive employee outcomes through appreciating employee loyalty
Rose, 2010; South Africa	Radiation exposure and protection	
Russell, 2021; Australia	Graduate nurse transition during COVID	
Saif, 2017; Jordan		Organisational culture in private Jordanian hospitals divides into four types: clans, adhocracies, markets and hierarchies Hospitals need facilitators, entrepreneurs, team builders, innovation and less demanding workplace

Article	Removed reason	Kept reason
Shahmari, 2023; Iran		Nurses' safety during COVID: organisational challenges, future plans for dealing with pandemic includes attending to human resource issues, more education, promoting workforce health protection to improve nurses' safety and work environment
Shumba, 2017; Uganda		Staff retention strategies through organisational culture
Skingley, 2021; UK		Effective clinical leadership facilitated practice change
Stark, 2019 USA		Communication for teamwork supported by leadership, transparency culture of trust in the organisation, multiple communication channels and *esprit de corps*: common spirit that inspires enthusiasm for commitment to the organisation
Tillott, 2013; Australia		Framework to promote nurse engagement to promote retention, cites Manley 2008 that workplace culture requires: shared governance, role clarification, transformational leadership, open communication, teamwork, safety, person centredness, support and challenge, lifelong learning, and stakeholder participation
Wilson, 2020; European Union		Using situational awareness like airlines to achieve goals Mental models in the operating theatre, improved communication within teams
Wu, 2022; China	Validating tool for patient safety culture	
Zhao, 2023; China		Teamwork to protect each other during COVID

Appendix 6: Nursing excellence – search strategies and PRISMA flowcharts

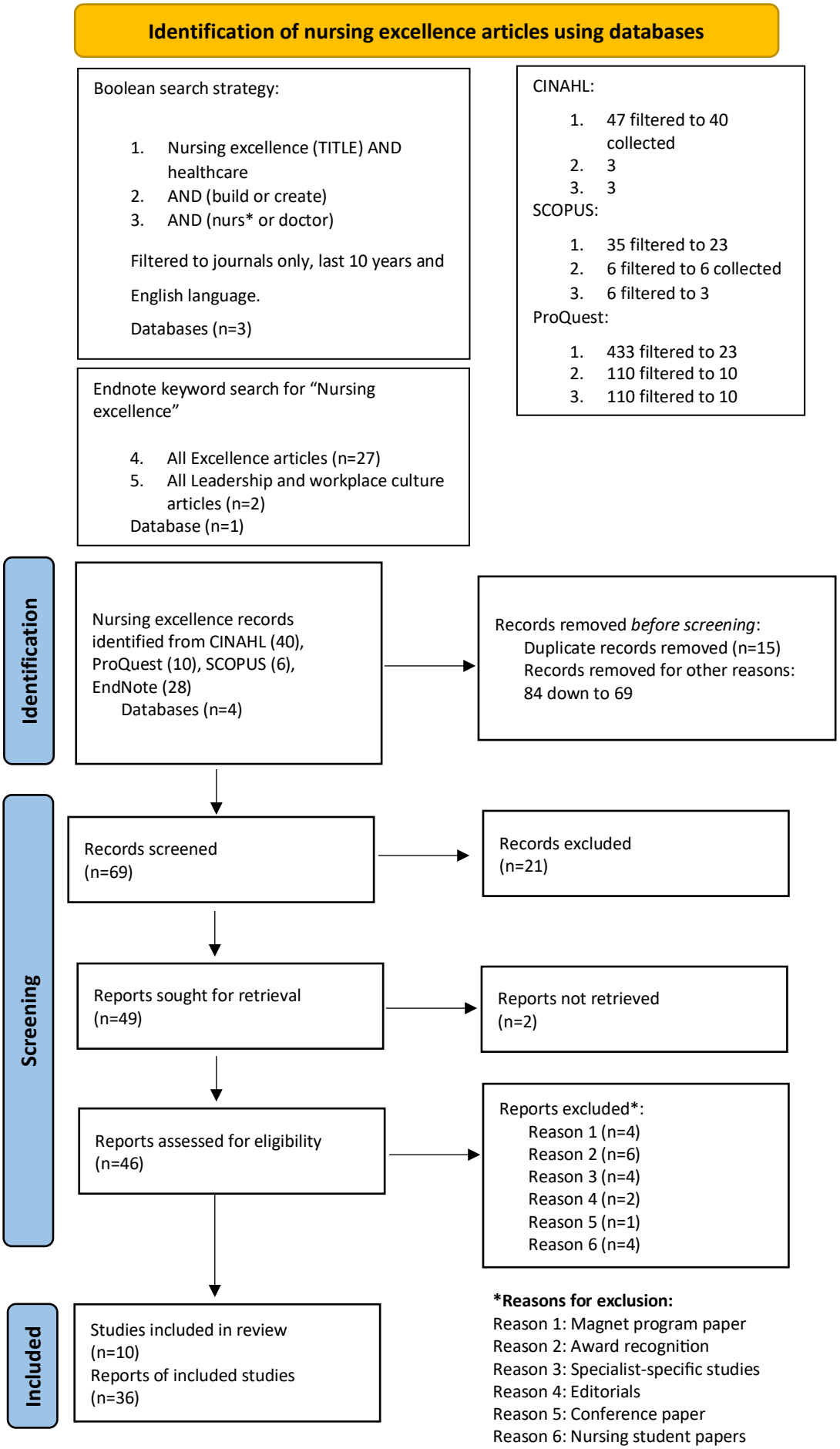
Search strategy – databases

Keywords	Boolean phrases	Databases	MeSH terms	Inclusion criteria	Exclusion criteria
Nursing excellence Healthcare Nursing staff Healthcare quality Leadership Nursing research Patient safety	**Search 4. Nursing excellence** Nursing excellence (TITLE) AND healthcare AND create or build	ProQuest SCOPUS CINAHL	Multidisciplinary care team, healthcare delivery, quality of healthcare, outcomes of healthcare	Last 10 years (2013–2023) Academic journals only English only (Adults only for CINAHL)	Older than 10 years Non-English languages

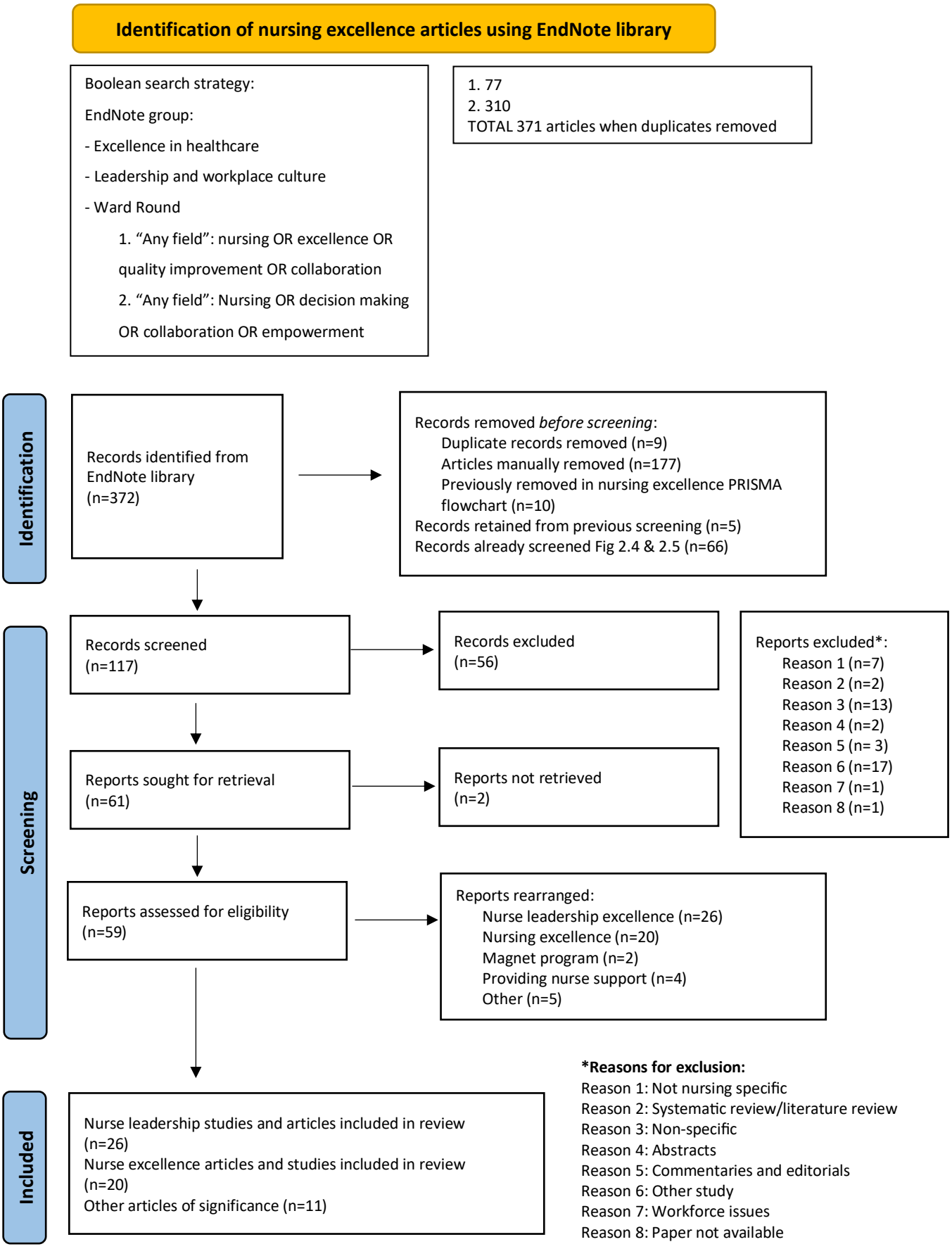
Search strategy – EndNote library

Keywords	Boolean phrases	EndNote library group searched	Inclusion criteria	Exclusion criteria
	"Nursing excellence" keyword search in EndNote	Collected articles in groups: 1. Excellence in healthcare 2. Leadership and workplace culture		
Nursing, communication, safety, patient advocacy, empowerment, change management, staff development, quality improvement, teamwork, leadership, treatment outcome, organisational culture	1. "Any field": nursing OR excellence OR quality improvement OR collaboration	Excellence, group searched Nursing excellence group Excellence, Ward round, Leadership and workplace culture groups searched Nursing excellence	Last 10 years Academic journals only	Non-English languages
Nursing and collaboration	2. "Any field": nursing OR decision making OR collaboration OR empowerment	Excellence, Leadership and workplace culture groups searched Nurses and decision making	Last 10 years Academic journals only	Non-English

PRISMA flowchart – database search



PRISMA flowchart – EndNote search



Appendix 7: Screening for nurse excellence articles

Article	Removed reason	Kept reason
2013 Nursing Times, UK		Nurses leading from the bedside
2015 Nursing Standard, USA	Editorial	
2022 Boamah, Canada		Transformational leadership is required to keep staff
2022 Gregersen, Denmark		Patient decision making, trusting physicians about treatment and nurses about care Cancer study
2020 Akbiyik, Turkey		Relationships better than task-focused leadership behaviours to improve patient outcomes
2022 Simon, USA		Servant leadership promotes empowerment, transparency and sharing of ownership
2022 Saleem, Pakistan		Servant leadership
2022 Ryder, UK		Need higher thinking for advanced practitioners to promote fundamentals of care
2022 Ryder, UK		Need research to improve evidence-based practice and nursing profession
2022 Rosli, Malaysia	Assessment skills study	
2022 Paterson, Australia	Documentation study	
2022 Labrague, Philippines		Transformational leadership
2022 Kranenburg, Netherlands		Supporting nurses in COVID-19
2022 Glasgow, USA		Using academic leadership
2022 Fradelos, Greece	Spiritual care study	
2022 Deena, USA	COVID-19 workforce issues	
2022 Chicoine, Canada	Substance disorder study	
2022 Bai, Canada	Behaviour change wheel, theoretical domains framework (TDF) for primary care	
2022 Anna, Sweden	Patient interview study	
2021 Wang, China		Evidence-based care through leadership and work environment using mentors
2021 Wang, China		Better care with nurse leaders who encourage empowerment, relationships and environment
2021 Rijpkema, Netherlands	Cardiac study for frailty readmissions due to caregiver communication	

Article	Removed reason	Kept reason
2021 Pullen, European Union	Primary care	
2021 Lown, USA		Need compassion for staff wellbeing
2021 Labrague, Jordan		Authentic leadership
2021 Labrague, Jordan		Effect of toxic leadership on nurses and patient care
2021 Graves, USA	Academic study	
2020 Towery, USA		Heart failure nurses lead excellence
2020 Swamy, USA	Veterans' health and nurse burnout	
2020 Skela – Savic, European Union	Safe nurse:patient ratios	
2020 Prinsloo, South Africa	Early warning study	
2020 Pierce, USA	Thesis	
2020 Mudd, Australia	Analysis of nursing theories	Nursing leadership can reduce urinary tract infections in indwelling urinary catheter use
2020 Landerfelt, USA		
2020 Hai-Ping, China	Multicultural study	
2020 Elue, USA	Handover study	
2020 Ebert, Australia	Teaching study	
2020 Bergstedt, USA		Transformational leadership and authentic leadership strategies
2020 Barkhordari, Iran		Ethical leadership
2020 Baek, Korea		Attention to work environment and compassion satisfaction for nurses
2020 Badu, Australia		The organisation can support nurses' own personal resilience and coping with workplace stress
2019 White, Australia		Catheterisation laboratory study measuring deterioration response of nurses
2019 Umrani, Pakistan	Unable to get article	Transformational leadership
2019 Shirey, USA		Authentic leadership L for teamwork
2019 Sharpp, USA		E-leadership, using technology Nurses need to be involved in the design
2019 Semroc, USA	Maternity study	
2019 Luger, Canada		Using TeamSTEPPS to facilitate graduates' transition and create a leadership program
2019 Lucas, UK		Identify personal qualities required for nursing leadership
2019 Horlait, Belgium		Workplace culture and multidisciplinary team meetings in cancer
2019 Fischer, USA		Magnet vs non-Magnet practices and outcomes

Article	Removed reason	Kept reason
2019 Dresser, USA		Acute deterioration and clinical judgement
2019 Dent, USA	Culture and negativity and organisational leadership	
2019 Burkoski, Canada		Digital leadership in nursing
2019 Bogue, USA		Executives aid in nursing empowerment strategies
2019 Boamah, Canada		Need for informal clinical leadership from nurses to improve quality of care
2019 Turunen, Finland		Transformational leadership in adverse events: nurse unit managers must have skills to motivate and empower staff to avoid adverse events and promote safety
2018 Toole, USA	USA study to improve collaboration	
2018 Tang, Singapore		Collaboration between nurses and doctors
2018 Sharma, European Union		Leadership assists change
2018 Nzinga, Kenya	Not nurse specific	
2018 Niederhauser, USA		Nursing voice for excellence
2018 Kredo, South Africa	Behaviour change wheel	
2018 Kitson, Australia		Fundamentals of care, nurse relationship vital
2018 Hackett, UK		How nurses work with doctors to improve practice
2018 Jeon, Korea	Review leadership program	
2018 Jabbour, Canada	Clinical pathway adoption	
2018 Ferguson, Australia	Mid-career researcher study	
2018 Feiring, Norway		Higher scope for nurses improves patient care and multidisciplinary team dynamic
2018 Dzau, USA	Not nurse specific	
2018 Cho, Korea		Patient safety driven by nursing
2018 Cations, Australia	Training program	
2018 Calzone, USA		Nursing leadership in Magnet hospitals increases education
2018 Al-Hussami, Jordan		Nurses required to promote change due to relationships with leaders and organisation etc.
2017 Nibbelink, USA		Experience of nurse affects clinical decision making in acute care
2017 Kitch, Canada	Creating home care opportunities	
2017 Johnson, Australia		Advanced nurses teach junior doctors to create a team
2017 Hahtela, Finland	Workplace culture specific	
2017 Fowler, Australia	Academic based	
2017 Foster, Australia	Nursing students	

Article	Removed reason	Kept reason
2017 Crowne, uSA	Emotional intelligence and transformational leadership in nursing home	
2016 Myers, USA	Nursing experience study	
2016 Murray, uSA		Nurses create a shared decision tool in paediatrics
2016 Edmonds, Australia	Nursing competency standards	
2016 Dombrowski, USA		Systematic review but useful concepts
2016 Davis, Australia	Aged care study	
2016 Dahinten, Canada	Repeat work on nurse empowerment	
2016 Boyal, UK		Senior nurses need a voice at the board level to enact organisational change and inform board level decisions
2016 American Association of Critical-Care Nurses (AACN), USA	AACN Standards	
2015 Pucher, UK	Ward round practice	
2015 Lakshminaraya, UK	Non-nursing	
2015 Holodinsky, Canada	Not nursing specific	
2015 Hickson, New Zealand		Nursing contribution to quality and job satisfaction though leadership etc.
2015 Gerardi, USA	Leadership training for conflict resolution	
2015 Foth, Canada	Primary care	
2015 Boyde, Australia	Myocardial infarction cardiac rehabilitation study	
2015 Baillie, UK	Practice development	
2015 Allen, UK	Bullying education	
2014 Turkington, UK		Nurse-led resuscitation guidelines reduce cardiac arrest
2014 Reichert, USA	Not nurse specific	
2014 Punjabi, UK	Non-nursing	
2014 Coelho, South America	Unable to get article, non-English	
2014 Belbeck, Canada	Abstract	
2013 Zwarenstein, Canada	Not nurse specific	
2013 Reis, USA	Editorial	
2013 Mitchell, Ireland		Change theory supported by nurse managers
2013 Lundeen, USA		Bachelor registered nurses can apply research to evidence-based practice
2013 Lees, UK		Nurses' role in ward rounds
2013 Hurley, Australia		Literature review of nursing leadership in Australia

Article	Removed reason	Kept reason
2013 Happell, Australia		Identifying nurse stress and leaders need to engage and support staff
2013 Anonymous, UK		Patient care nurses are required to communicate and collaborate with the multidisciplinary team to maximise patient care per the Royal College of Physicians and Royal College of Nursing guidelines
2011 Larsson, Sweden		Effect of nursing behaviour upon patient participation
2011 Haigh, UK	Staffing article	
2007 Hogan, Australia		Human resources and nursing retention in Australian hospitals
2006 Huba, UK?	Unable to get article	Valuing nurse leaders for geriatric care
2004 Knox, USA	Repeat nursing excellence paper, abstract only	
2000 Zwarenstein, Canada		Nurses required on ward round for greater collaboration with doctors

Appendix 8: Ward round search process including terms and databases

Keywords	Boolean phrases	Databases	MeSH terms	Inclusion criteria	Exclusion criteria
Ward round, round Collaboration, communication Decision, decision making Quality improvement, efficiency Checklist, proforma Time Nurse Consultant Patient Multidisciplinary "Nursing excellence"	"Ward round" and round AND doctor* and nurs* and team patient care" NEAR4 decision* Outcome or "patient outcome" "Clinical decision making" Healthcare or hospital Cardiac or cardiology Time or efficiency	ProQuest CINAHL PubMed OVID SCOPUS Google Scholar Google EndNote ward round group	Patient rounds, teaching rounds Organisation and administration Organisational culture Efficiency, quality improvement Time factors, time to treatment	Hospital ward rounds Doctor and nurse collaboration Multidisciplinary Culture Decision making Communication, handover processes Patient inclusion Relevance to last 10 years Research and editorials Systematic and literature reviews Worldwide Doctor and nurse perspective Cardiology and other disciplines All dates considered to gain perspective Academic sources	Medical student simulations Dental care Clinics and community teams Non-hospital institutions Non-English versions Non-academic sources

Appendix 9: Ward round literature review – article analysis

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
1. Li et al., 2022; China	Explore a **communication** mode, AIDET – *Acknowledge, Introduce, Duration, Explanation and Thanks* – with medical and nursing integrated rounds	Cardiac ward Patients undergoing Percutaneous Coronary Intervention (PCI) Doctors and nurses	Randomised control trials Nursing satisfaction Cardiac function Self-nursing ability Short-term prognosis Quality of life (QOL)	Improved for research group ($p<0.05$) except for QOL scores	Small sample size and single centre Total 60 PCI patients: Control group n=30 Research group n=30 Clinically significant	AIDET is a **communication** method to improve the patient voice between doctors and nurses. Improves work efficiency of doctors and nurses and creates a culture where nurses are empowered to make decisions and lead patient care.
2. Royal College Of Physicians and Royal College Of Nursing, 2021a; UK	30 **case studies** of ward rounds in Britain and Europe Implementing the ward round guidelines into practice and reflecting upon their outcomes	28 hospitals around the UK and Europe	Each hospital commented on improvements according to their own clinical needs	**Structured interdisciplinary ward round teams** reduced: Length of stay Readmissions Medication errors Mortality Ward round preparation Created nursing leadership roles to improve patient ambulatory care pathways **Preparation and checklists** acknowledge nursing surveillance and contribution to vital information as well as reducing ward round time Opportunity for teaching Board rounds improve patient flow **Bedside ward round:** Situational awareness of the team helps junior staff learn, and attention to workplace culture improves overall decision making Improves patient participation and updated treatment plans, EMR makes it easier to keep up to date **Patient partnership** Shared decision making and addresses patient goals of care **Education** Provide ward round simulations and opportunity for less-senior staff to lead the ward round	Quality improvement within each hospital or clinical service	Value specialist nurses to improve **decision making** Improve **communication and collaboration** between doctors and nurses Improve patient safety with **documentation tools** Board rounds and bedside rounds are effective for communication and collaboration and timely delivery of care that improves patient flow Allowing the whole team to contribute improves staff education and trust and respect amongst members **(situational awareness)** **Patients are included** in the bedside ward round discussions and understand treatment and discharge plans better Ensuring structural changes to the ward round improves safety and quality of patient care

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
				Quality management Using the ward round to determine quality concerns and reflect on practice Using a PDSA cycle to improve ward round processes		
3. Ramkumar et al., 2017; AUS	Evaluate cardiac **telemetry** guidelines	Phase 1: Prospective observational study (6 months) Phase 2: Prospective interventional study (3 months) Australian tertiary hospital	Daily telemetry ward round Primary endpoint: reduction % in class III indications (i.e. Low-risk) Secondary: duration	38% inappropriate monitoring reduced to 11%, p<0.001 Duration of monitoring in the emergency department (ED) reduced by more than 12 hours, improving patient flow	Single centre Small sample size Possible interpreter bias due to primary authors classifying arrhythmia classes No follow-up data collected Too complicated for cost analysis	**Cardiac-specific study:** Daily **decision making** by senior registrar using telemetry admission guidelines improved timely delivery of care and use of scarce telemetry resources Possibility to incorporate nursing decision making into this model due to situational awareness, i.e. **communication and collaboration** with ED nurses and appreciating **nursing surveillance**
4. Javaid et al., 2017; UK	Optimise fluid management and up-titrate **heart failure therapy**	PDSA cycle Quality improvement	Compared a 2-week proforma with a 1-week proforma + renal function on the daily ward round	Fluid management: 60–100% Up titration: 22–100%	Small sample size: Cycle 1: n=9 Cycle 2: n=10 No research methodology Inconsistent duration of variables	**Cardiac-specific study** Using ward round **proforma** to collate patient information facilitating decision making at the bedside
5. Garg, 2011; UK	Using a **checklist** on the cardiology ward round to improve patient quality care	Editorial				**Cardiac-specific editorial** Reflecting the use of **checklists** and pathways elsewhere in the NHS and how easily they can be adapted to patients receiving cardiac procedures Ensures elements of care are not missed
6. Herring et al., 2013; UK	Introduced a ward round **checklis**t to improve time and quality of ward rounds	UK hospital 168 routine ward rounds 190 post-take ward rounds 3 to 4 doctors present	Quality improvement	"Improved teamwork, communication with patients and patient satisfaction" Nurse presence is required	Single centre	**Nurse presence** on the ward round is considered vital and the checklist encouraged their inclusion with the patient conversation **Checklists** improve teamwork, communication and collaboration as well as patient safety

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
7. Shetty et al., 2018; UK	**Improve quality** of surgical ward rounds Reduce adverse patient outcomes Reduce financial burden	Literature review from 1975 to 2016	Narrative literature review	Stability of ward round members or network Communication and collaboration breakdown due to workload issues, breakdown in continuity of care, professional hierarchy, and lack of teamwork Require leadership and education Patient-centred approach is required Using checklists to help staff learn and provide transparent documentation to improve patient safety Use proformas to assist in documentation Electronic medical records patient safety alerts, e.g. medication errors Adequate time and empathy between doctors and patients improve patient inclusion		Enforces the importance **of communication and collaboration** between doctors and nurses as well as patient inclusion **Leadership** is required to encourage a positive culture and teamwork **Checklists** and proformas are beneficial to documentation of patient plans, results and medications, etc. The **electronic medical record** facilitates effective and up-to-date information transfer
8. Conroy et al., 2015; Australia	Validating an electronic process of care **checklist**	19 bed ICU in a tertiary hospital 6-week baseline data 4-week education and training 6-week intervention	Prospective before–after interventional study Audits "were analysed using generalised estimating equations"	Pain management improved by 42%, p<0.001 Glucose management improved by 22%, p<0.001 Head of bed elevation improved by 19%, p<0.001 e-checklist considered to improve the delivery of essential daily care	Single centre Small sample size	**Checklists** can improve patient care
9. Dewson et al., 2020; UK	Commentary encouraging the use of a daily ward round **proforma**	Colorectal department in a tertiary hospital assessing 79 ward round entries prior to implementation and 43 post implementation	Quality improvement	1. Improved communication between doctors and nurses 2. Better understanding of treatment plan and tests ordered 3. Checklist properties improved safety, e.g. antibiotic use, venous thrombosis prevention	Single centre Small cohort p<0.05 in 10 out of 12 domains: Patient identifiers Diagnosis Findings upon examination Fluid balance Blood results Signature of documenter	The **proforma** is a communication tool and allows for patient safety due to **checklist** properties; improves **communication** between nurses and doctors

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
10. Conroy et al., 2017; Australia	Professional development promoting the importance of effective nurse–patient **relationships**		Professional development	Integral for patient safety and healthcare delivery Enables patient-centred care Benefits the workplace culture to improve situational awareness and thus respectful professional relationships		Promotes **patient inclusion** in their care and allows nurses to improve patient advocacy Improving **situational awareness** among nursing colleagues improved communication and collaboration
11. Walton et al., 2016; Australia	To classify: Purpose of ward rounds Who attends **Roles** and perceptions of their roles	39 papers 8 round classifications identified	Literature review of face-to-face, medical ward rounds	Multidisciplinary rounds are the most collaborative Mostly attended by doctors Limited findings on allied health professionals and patient inclusion More work required to investigate teamwork Difficult to define the structure of a ward round 8 round classifications: Ward (n=21) Multidisciplinary (n=10) Consultant (n=5) Teaching (n=4) Post-take (n=2) Traditional (n=2) Working (n=2) Review of ward (n=1)	Systematic search of the literature	**Communication and collaboration** between doctors and nurses; however, nurses do not feel comfortable or included in the ward round conversations **Consultants** need to take l**eadership** to ensure the culture of teamwork between doctors and nurses when on the ward round, but need to reduce the hierarchical nature and improve situational awareness Need to adapt ward rounds according to different clinical areas and patient care requirements
12. Walton et al., 2019a; Australia	Improve **teamwork**, patient care and coordination of care on the ward round	77 participants in 2 acute and 2 rehabilitation wards in a metropolitan teaching hospital	Qualitative survey of doctors, nurses and allied health professionals	The workplace culture of the organisation is complex, although all professions strive for patient-centred care and holistic care delivery But this is challenged by a lack of attendance on the ward round	Compared 2 wards Contextual sample size for clinical unit	The communication and **consultant-led** ward rounds are important All healthcare workers want to attend the ward round to improve communication etc.; however, they are limited by time constraints and workforce issues The organisation needs to focus on these issues and improve the workplace culture to facilitate better **communication and collaboration** opportunities by the interdisciplinary team

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
13. Walton et al., 2019b; Australia	Examine **patient participation** on the ward round	Acute medical ward and a rehabilitation ward in a single Australian hospital	Observational study on 14 patients followed by semi-structured interviews	Descriptive and thematic analysis revealed: Patients are mostly unfamiliar with ward rounds and how they need to participate If they have experience with the healthcare system, they are more likely to be involved but prefer to hear from the senior medical officer	Single centre Small sample size	**Patient participation** on ward rounds is limited because they do not feel included or know what they are supposed to say; they do not understand the ward round process and how important their participation is Patients want to be better prepared: knowing when the ward round will take place and what they need to say; being forewarned about the questions; also having a **nurse present** Recommend more research to see impact of effective ward rounds
14. Zwarenstein and Bryant, 2000; Canada	Assess impact of interventions that change doctor–nurse **collaboration** on patient satisfaction and healthcare delivery efficiency	2 RCT trials found: Study 1: Patients and staff randomly allocated and 3/6 wards allocated to intervention; multidisciplinary rounds where staff made joint decisions Study 2: Randomised patient allocation to intervention with controlled before and after; 4 ward rounds per week with joint decision making with doctors and nurses; with weekly case conference focusing on LOS	**Systematic review**	Study 1: A multidisciplinary ward round, structured rounds for half of wards in allocation: "LOS, mortality, discharge home, charges, discharge nursing home, provider satisfaction, ancillary service recommendation adherence" LOS for medical patients 6.06 to 5.46 days Reduced costs with lower readmissions Improved staff satisfaction due to teamwork and improved understanding of patient care Study 2: "LOS, mortality, discharge home" LOS 11.6 to 11.7 days – no difference; however, for surviving patients, LOS 11.9, down to 10.5 for intervention	Study 1: USA, 1998, >10-year-old study, 6-month trial included 1102 patients, single centre No correction for clustering, but not considered to make any substantial change to conclusion Study 2: Thailand, 1995, >10-year-old study, small study, single centre Analysed without correction for clustering Compared 1 female ward with another No evidence of improved collaboration for either study	This article highlights how difficult it is to measure the effects of **communication and collaboration** on patient outcomes This systematic review suggests adding **patient** morbidity and **satisfaction**, and staff satisfaction to the analysis; also randomising ward rounds by a cluster analysis Highlights how **rare** is it to find **RCT** ward round studies

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
15. Zwarenstein et al., 2013; Canada	First large qualitative study aiming to understand how interprofessional **communication** impacts patient care	Canada, general medicine wards in 2 urban teaching hospitals 155 hours data collection	Qualitative study: **Ethnographic and semi-structured interviews**	Physicians were disengaged with nurses and allied health etc.; decisions were made only within a medical perspective, not patient-centred; the interdisciplinary team does not exist in reality Knowledge barriers exist, i.e. not aware of other profession's viewpoint General medicine patients are more complex and require more interprofessional decision making More training can improve patient-centred communication techniques EMR reduces cognitive burden and improves joint decision making Need to consider existing power differentials amongst the healthcare team	Interview process may have altered participants' behaviour and therefore answers to the questions Tried to limit the author's preconceptions	Need to understand the culture within the doctor and nurse relationships in CCU There may be barriers to **communication and collaboration**
16. Desai et al., 2011; UK	Assess the benefits of using a consultant-led ward round with a checklist to ensure nurse presence so that patient care and safety, as well as patient and staff satisfaction, is improved	146 consultant ward rounds between April 2009 and June 2010, 1921 patient reviews, by Dr Gordon Caldwell, an endocrinologist, in a general hospital on the south coast of England	Audit nurse presence on the ward round using the checklist Encourage doctors to actively communicate with nurses on the ward round	Improved quality of interprofessional communication between doctors and nurses *Initial findings:* Pre-ward round discussion with a nurse: 31% Bedside ward round nurse presence: 59% Post-ward round nurse communication: 16% outlier, 12% home ward Post-study practice change to seek out nursing staff for professional conversations *June to August 2010:* Bedside ward round nurse presence: 76% Post-ward round nurse communication: 100% *Since August 2010* (moved into single specialty unit): Pre-ward round discussion with a nurse: 24% Bedside ward round nurse presence: 68% Post-ward round nurse communication: 94%	Single centre Ward round practice implications suggested	Need for nurse presence to prepare for the ward round, attend the ward round and participate in post-ward round discussions Address team culture and nurse presence for preparation and during the ward round and using the Caldwell considerative checklist Nurse presence and inclusion in professional discussions between doctors and patients is valued by the patients and doctors so that safety and quality care is maintained Need to allocate specific time for nurses to attend regular ward rounds
17. Manias and Street, 2001; Australia	Description of critical care nurses in ward rounds with a focus on **culture**	6 registered nurses in a critical care unit in an Australian hospital	**Ethnographic** study Unstructured data collection from the entire environment Journalling, observation, individual interviews and focus groups	The environment can hinder or promote communication Decision making is mostly by doctors Lack of value for nursing input if the consultant does not make the nurse visible in the conversation Hierarchical decision making Communication by the nurse does not mean collaboration exists	Small sample size Single centre Thorough analysis	**Nurse presence** on the ward round is not effective if their input is not valued by the team Need a **culture** that includes and recognises all professional discussions

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
18. Zamanzadeh et al., 2021; Iran	Evaluate and describe barriers against nurse participation and collaboration on the ward round	February 2019 to March 2019 7 papers found	**Integrative literature review**	4 main categories: - Time limitation - Reluctance to participate - Ineffective communication - Infrastructure and administration Recommend practice changes in Iranian hospitals	Systematic approach	**Nurse presence** on the ward round is not valued and ward rounds mostly lack structure Nurses need to know the time of the ward round and the culture needs to recognise all professional discussions
19. Beck et al., 2015; USA	Family and nursing contribution toward teaching behaviours: **situational awareness**	2012–2013 Paediatric hospital 15 nurses and 13 family members	**Qualitative** study Focus groups with nurses and families	4 categories of awareness: - Cognitive factors - Logistics and time management - Physical environment - Emotional state Led to teaching strategies	Single centre Small sample size	**Situational awareness** improved training and education of nurses and family members.
20. Johnson et al., 2017; Australia	Improving patient management through interprofessional **collaboration**	Australian adult tertiary hospital 3 APN and 99 junior doctors	**Mixed methods** 86 intervention shifts (new APN role) compared to 106 regular shifts Plus interviews	APN support assists junior doctor: Task completion Education Encourages proactive behaviour Reduces interruptions to work and thinking processes Promotes teamwork, situation awareness, skills, confidence and wellbeing for junior doctors	Single centre Mixed methods	Specifically, **advanced nurses** can improve interdisciplinary teamwork through opportunity to participate in **situational awareness** with doctors
21. Triggle, 2012; UK	2012 reflection on the importance of **nurse presence** on the ward round	Discussing the Royal College of Physicians and Royal College of Nursing paper regarding best ward round practices in Britain in 2012	Editorial	Recommendations: Pre-ward round preparation Early consultant-led ward rounds Nurses present on the ward round Patients and significant others understand the treatment plan Extra support for dementia patients or those with learning disabilities Contextual checklists to reduce omissions	Based on the NHS guidelines document	Benefits of each recommendation to the design of the study: **Preparation** **Consultant-led** **Nurse presence** **Patient inclusion** **Checklists**
22. Swenne and Skytt, 2014; Sweden	Investigate **patient participation** during the ward round	14 patients	**Qualitative** and descriptive Interviews	Patients find it easier to understand nurses than physicians Patients need to be given the opportunity to participate in the decisions made about their care on the ward round	Single centre Small sample size 1 major theme extracted 3 subthemes to inform practice changes on the ward round	**Patient inclusion** in decision making on the ward round is important, and **nurse participation** on the ward round can facilitate the patient voice through **advocacy**

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
23. Clay-Williams et al., 2019; Australia	Implement an intervention to improve **decision making**	ICU in a tertiary Australian hospital 31 participants Focusing on ICU bed status and planned elective admissions	Multimethod before and after intervention case study using interviews, process mapping and collecting administrative data Inductive interpretative analysis	Determining red, amber and green bed status Focusing on clinician roles and behaviour at a morning meeting to determine the ICU escalation plan Rules around bed allocation improved interprofessional relationships and reduced the number of elective surgeries	Single centre Small sample Thorough analysis Did not include the patient voice	Doctor/nurse **collaboration** improves **decision making**
24. Clay-Williams et al., 2018; Australia	Improve patient outcomes and teamwork using a daily **structured** interdisciplinary ward round	Acute medical unit in a large, tertiary care, regional Australian hospital 32 clinicians	Qualitative study Semi-structured interviews	Improved teamwork: nurses felt more empowered, able to show greater initiative, more trust, communication and collaboration developed between team members Patient inclusion and advocacy during ward round improved Reduced cost of stay and "calls for clinical review" No significant reduction in LOS Success of a multimethod evaluation of an intervention performed in context can improve patient outcomes: LOS, discharge date and time, cost of stay, calls for clinical response, mode of separation	Single centre Importance of recognising contextual factors as well as clinical outcomes	Mandating a time for ward round encourages staff participation The restructured ward round benefited **teamwork** and thus patient outcomes, as well as more **patient advocacy and inclusion** in ward round discussions
25. Tang et al., 2018; Singapore	Researching experiences of junior doctors and nurse **collaboration**	11 junior doctors (6 months to 3 years experience) and 8 nurses (1st and 2nd year in clinical practice) recruited from a 991-bed Singaporean tertiary hospital	Qualitative exploratory study Thematic analysis of interviews	Nurse leaders as responsible for providing time for nurses to attend the ward round and be involved in the clinical decision-making process that impacts patient care Themes: 1. Working towards better patient care 2. Struggling to cope 3. Interpersonal relationships 4. Nurses to take on more responsibilities Possible simulation training and scenario teaching may assist nurses and doctors to improve communication	Inductive thematic analysis by 2 independent researchers; a third researcher helped validate the findings	**Nurses need to be empowered** to make effective decisions in collaboration with the ward round team Nurses advocate for patients and improve ability for **patient inclusion** on the ward round **Situational awareness** within the team will facilitate better **communication and collaboration** amongst doctors and nurses on the ward round **Leadership** needs to support this culture

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
26. Peate, 2021; UK	Apply the **multidisciplinary** ward round recommendations by the Royal College of Physicians and Royal College of Nursing	British Journal of Nursing	Editorial	Nurses need to assert themselves Sometimes consultant-led ward rounds will be better served by senior nurses in certain contexts Need to make nurses feel valued for their contribution to patient advocacy Maximise nursing's scope of practice Place the ward round as a priority of care and include patients in their care	Focusing on ward round practice in all UK hospitals	**Empowering nurses** to make effective decisions and patient inclusion in their own care
27. Lees, 2013 UK	Nurse consultant and senior clinical research fellow discussion regarding the importance of **nurse presence** on ward rounds	Using the Royal College of Physicians and Royal College of Nursing recommended ward round guidelines from 2012	Editorial	Key aspects of the nurse's role: Advocate Chaperone Transitions Informative Organiser Nurse-centred – holistic viewpoint	Commentary outlining the strengths of nurses to the entire ward round process **Nurses lead patient care**	The importance of **nurse presence** and **empowering nurses** to make effective decisions, as well as ensuring **patient participation** on the ward round Benefits teamwork and a culture that includes **situational awareness**
28. Ahmad et al., 2015; UK	Reducing unnecessary overuse of investigations and medications through **twice-daily consultant ward rounds**	Two medical wards in a tertiary hospital in Liverpool, UK	2 years of data collected from acute admissions, both before and after the intervention of twice-daily consultant ward rounds A cost–benefit analysis to determine money saved	Changing twice-weekly to twice-daily consultant ward rounds reduced costs in medication and investigations Costs down by 50% per patient over 1 year and sustained in the following 12-month period LOS was almost halved Improved staff education and decision-making processes for doctors when ordering tests and medications Consultant ward rounds need to continue every day	Cost savings were sustained over 2 years Twice-daily ward rounds rather than weekly ward rounds did reduce costs Did not take into account bed or staffing fluctuations Only compared 2 medical wards but case mix similar to medical wards in all major hospitals Considered a sustainable and reproducible intervention Nursing is not included	**Twice-daily consultant ward rounds** reduce unnecessary investigations and medication use as well as impact LOS

Author/date Country	Aim and objective	Sample and setting	Methodology and measures	Major findings	Limitations, rigour and validity	Significance to question
29. Reddin et al., 2019; Ireland	Understanding the **patient's perception** of the ward round in respect to doctor–patient communication	A **cardiology** and urology ward round Total 168 inpatient questionnaires Cardiology ward round consisted of a cardiologist, registrar, RMO, 2 interns and a nurse 10-bed CCU and 12 other cardiac beds in 2 wards	Qualitative study using interviews and questionnaires	Observed poor understanding by patients during the ward round based on fear and exclusion Need to improve communication with patients to deliver superior, safe, patient-centred care Recommend prioritising the daily ward round Strengths were respect for privacy and high level of professionalism Urology repeated an evening ward round, which may have had a positive effect on patient education	No other studies have looked at cardiology inpatient perception of the daily ward round 98 cardiology and 70 urology patients No statistical analysis to determine central tendency Small sample size Single centre and short time frame Lack of other patient variables	**Included cardiology ward round** **Twice-daily consultant ward rounds** improve patient inclusion and understanding Better **patient inclusion** through improved **communication** processes between doctors and patients does improve patient care

Appendix 10: Outcomes from ward round literature review

Outcomes	Author and date	Major findings
Preparation		
	Royal College of Physicians and Royal College of Nursing, 2021a	**Preparation and checklists** acknowledge nursing surveillance and contribution to vital information as well as reducing ward round time.
	Desai et al., 2011	Need for **nurse presence** to **prepare** for the ward round, attend the **ward round** and participate in **post-ward round** discussions.
	Triggle, 2012	Preparation benefits the ward round.
Checklist/Proforma		
	Royal College of Physicians and Royal College of Nursing, 2021a	Improve patient safety with **documentation tools**. Electronic medical record makes it easier to keep up to date.
	Javaid et al., 2017	Using ward round **proforma** to collate patient information facilitates decision making at the bedside.
	Garg, 2011	**Cardiac-specific editorial** Reflecting the use of **checklists** and pathways elsewhere in the National Health Service and how easily they can be adapted to patients receiving cardiac procedures. Ensures elements of care are not missed.
	Herring et al., 2013	**Checklists** improve teamwork, communication and collaboration, as well as patient safety.
	Shetty et al., 2018	**Checklists** and proformas are beneficial to documentation of patient plans, results and medications, etc. The **electronic medical record** facilitates effective and up-to-date information transfer.
	Conroy et al., 2015	**Checklists** can improve patient care
	Dewson et al., 2020	The **proforma** is a communication tool and allows for patient safety due to **checklist** properties. Improves **communication** between nurses and doctors.
	Desai et al., 2011	Address team culture and nurse presence for preparation and during the ward round and using the Caldwell considerative **checklist**.
	Triggle, 2012	Checklist and proforma benefits the ward round.

Outcomes	Author and date	Major findings
Collaboration/Communication		
	Li et al., 2022	Improved for research group ($p<0.05$) except for quality of life scores
	Royal College of Physicians and Royal College of Nursing, 2021	Improve **communication and collaboration** between doctors and nurses. Allowing the whole team to contribute improves staff education and trust and respect amongst members (**situational awareness**).
	Ramkumar et al., 2017	Daily **decision making** by senior registrar using telemetry admission guidelines improved timely delivery of care and use of scarce telemetry resources.
	Shetty et al., 2018	Enforces the importance of **communication and collaboration** between doctors and nurses, as well as patient inclusion.
	Conroy et al., 2017	Improving **situational awareness** among nursing colleagues improved communication and collaboration.
	Walton et al., 2016	**Communication and collaboration** between doctors and nurses; however, nurses do not feel comfortable or included in the ward round conversations.
	Walton et al., 2019a	All healthcare workers want to attend the ward round to improve communication etc.; however, they are limited by time constraints and workforce issues. The organisation needs to focus on these issues and improve the workplace culture to facilitate better **communication and collaboration** opportunities by the interdisciplinary team.
	Zwarenstein and Bryant, 2000	This article highlights how difficult it is to measure the effects of **communication and collaboration** on patient outcomes. This systematic review suggests adding **patient** morbidity and **satisfaction**, and staff satisfaction to the analysis. Also randomising ward rounds by a cluster analysis. Highlights how **rare** is it to find **RCT** ward round studies.
	Zwarenstein et al., 2013	Need to understand the culture within the doctor and nurse relationships in CCU. There may be barriers to **communication and collaboration**.
	Desai et al., 2011	Nurse presence and inclusion in professional discussions between doctors and patients is valued by the patients and doctors so that safety and quality care is maintained.
	Manias and Street, 2001	**Nurse presence** on the ward round is not effective if their input is not valued by the team.

Outcomes	Author and date	Major findings
	Beck et al., 2015	**Situational awareness** improved training and education of healthcare professionals.
	Triggle, 2012	Benefits with communication and collaboration between doctors and nurses.
	Clay-Williams et al., 2019	Doctor/nurse **collaboration** improves **decision making**.
	Tang et al., 2018	**Situational awareness** within the team will facilitate better **communication and collaboration** amongst doctors and nurses on the ward round.
Nurse presence on the ward round		
	Royal College of Physicians and Royal College of Nursing, 2021a	Value specialist nurses to improve **decision making** in clinical care of patients
	Ramkumar et al., 2017	**Communication and collaboration** with emergency department nurses and appreciating **nurse surveillance**.
	Herring et al., 2013	**Nurse presence** on the ward round is considered vital and the checklist encouraged their inclusion with the patient conversation.
	Walton et al., 2019b	Need a **nurse present** to assist patient participation on the ward round. Recommend more research to see impact of effective ward rounds.
	Desai et al., 2011	Nurse presence and inclusion in professional discussions between doctors and patients is valued by the patients and doctors so that safety and quality care is maintained. Need to allocate specific time for nurses to attend regular ward rounds.
	Manias and Street, 2001	**Nurse presence** on the ward round is not effective if their input is not valued by the team.
	Zamanzadeh et al., 2021	**Nurse presence** on the ward round is not valued and ward rounds mostly lack structure. Nurses need to know the time of the ward round and the culture needs to recognise all professional discussions.
	Johnson et al., 2017	Specifically, **advanced nurses** can improve interdisciplinary teamwork through opportunity to participate in **situational awareness** with doctors.
	Triggle, 2012	Benefits with nurse presence on the ward round.
	Swenne and Skytt, 2014	**Patient inclusion** in decision making on the ward round is important and **nurse participation** on the ward round can facilitate the patient voice through **advocacy**.

Outcomes	Author and date	Major findings
	Clay-Williams et al., 2018	Mandating a time for ward rounds encourages staff participation. The restructured ward round benefited **teamwork** and thus patient outcomes, as well as more **patient advocacy and inclusion** in ward round discussions.
	Tang et al., 2018	**Nurses need to be empowered** to make effective decisions in collaboration with the ward round team.
	Peate, 2021	**Empowering nurses** to make effective decisions and patient inclusion in their own care.
	Lees, 2013	The importance of **nurse presence** and **empowering nurses** to make effective decisions as well as ensuring **patient participation** on the ward round. Benefits teamwork and a culture that includes **situational awareness**.
Patient inclusion		
	Royal College of Physicians and Royal College of Nursing, 2021b	**Patients are included** in the bedside ward round discussions and understand treatment and discharge plans better. **Patient partnership** Shared decision making and addresses patient goals of care.
	Shetty et al., 2018	Enforces the importance of **communication and collaboration** between doctors and nurses as well as patient inclusion.
	Conroy et al., 2017	Promotes **patient inclusion** in their care and allows nurses to improve patient advocacy.
	Walton et al., 2019b	**Patient participation** on ward rounds is limited because they do not feel included or know what they are supposed to say. They do not understand the ward round process and how important their participation is. Patients want to be better prepared, knowing when the ward round will take place and what they need to say. Being forewarned about the questions. Recommend more research to see impact of effective ward rounds.
	Triggle, 2012	Benefits with patient inclusion.
	Swenne and Skytt, 2014	**Patient inclusion** in decision making on the ward round is important, and **nurse participatio**n on the ward round can facilitate the patient voice through **advocacy**.
	Tang et al., 2018	Nurses advocate for patients and improve ability for **patient inclusion** on the ward round.

Outcomes	Author and date	Major findings
	Peate, 2021	Empowering nurses to make effective decisions and **patient inclusion** in their own care.
	Lees, 2013	The importance of **nurse presence** and **empowering nurses** to make effective decisions, as well as ensuring **patient participation** in the ward round. Benefits teamwork and a culture that includes **situational awareness**.
	Reddin et al., 2019	Better **patient inclusion** through improved **communication** processes between doctors and patients does improve patient care.
Consultant-Led and twice-a-day review		
	Shetty et al., 2018	**Leadership** is required to encourage a positive culture and teamwork.
	Walton et al., 2016	**Consultants** need to take **leadership** to ensure the culture of teamwork between doctors and nurses when on the ward round, but need to reduce the hierarchical nature and improve situational awareness. Need to adapt ward rounds according to different clinical areas and patient care requirements.
	Walton et al., 2019a	Communication and **consultant-led** ward rounds are important.
	Triggle, 2012	Benefits with consultant-led ward rounds.
	Tang et al., 2018	**Leadership** needs to support culture of situational awareness amongst the multidisciplinary team.
	Ahmad et al., 2015	**Twice-daily consultant ward rounds** reduce unnecessary investigations and medication use as well as impact length of stay.
	Reddin et al., 2019	**Included cardiology ward round**. **Twice-daily consultant ward rounds** improve patient inclusion and understanding.

CCU = cardiac care unit; RCT = randomised controlled trial

Appendix 11: Conceptual framework – keywords and search strategy

PROQUEST

(change and theory) and (practice and performance) and (healthcare) – >100,000 results

AND (organisational and theory) – 66,959; scholarly journals, last 10 years, English only 7184

AND TITLE (“change theory” or “organisational theory”) – 2 articles

AND “behaviour change wheel” – 98 results; 53 chosen articles in total

Keywords: Organisational theory, theoretical domains framework, change management, behaviour change, feedback, surveillance, intervention, quality, qualitative research, theory

MEDLINE

(change and theory) and (practice and performance) and (healthcare)

AND (organisational and theory) – 66,959; scholarly journals, last 10 years, English only

AND TITLE (“change theory” or “organisational theory”)

AND “behaviour change wheel” – 1 article: Scahill, S. L., 2012;
SCAHILL, S.L., 2012. 'The way things are around here': organisational culture is a concept missing from New Zealand healthcare policy, development, implementation, and research. The New Zealand Medical Journal (Online), 125(1348), pp. 79-89.

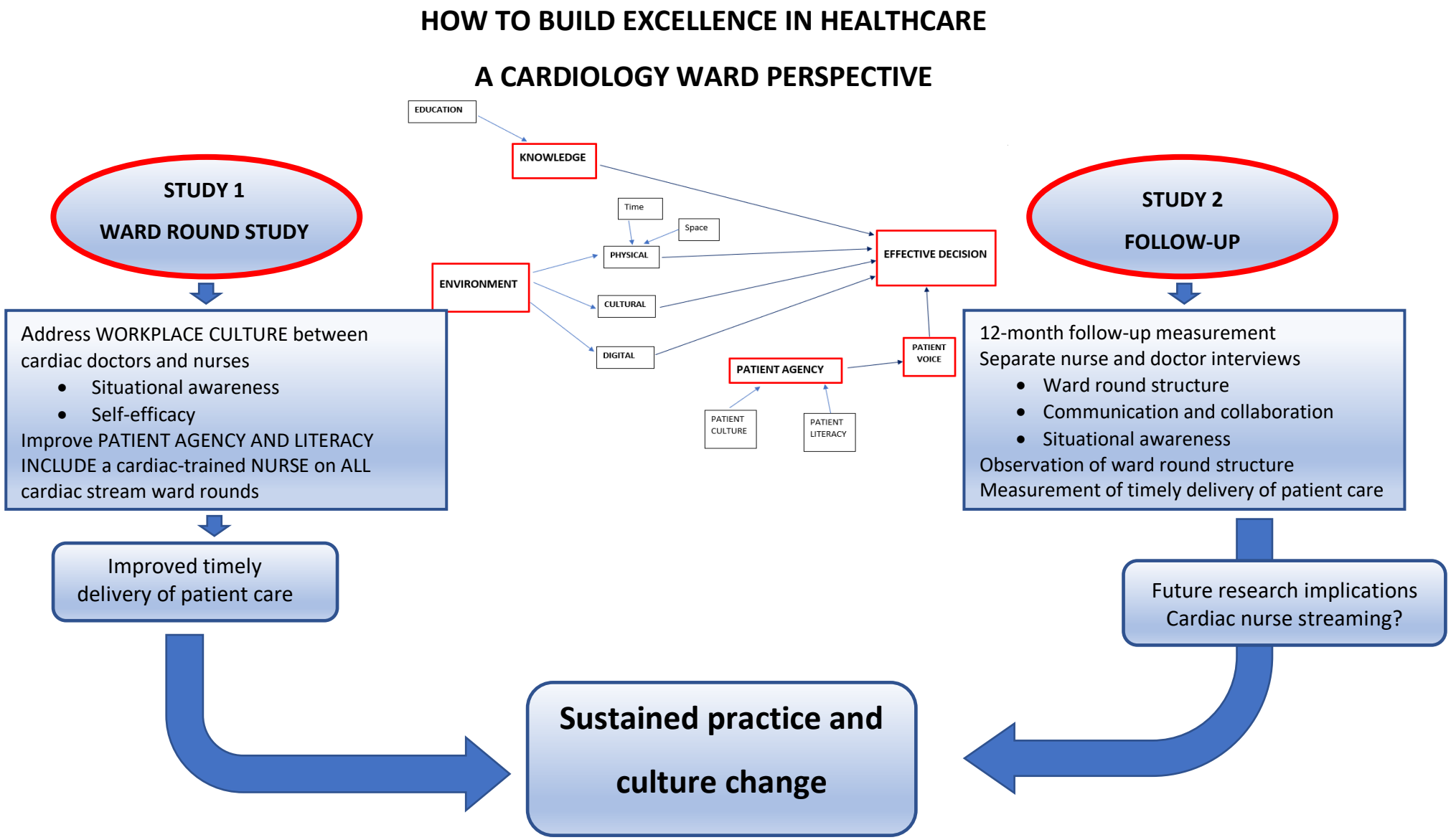
Change Boolean phrases to: (theory and “qualitative research” and “behaviour change wheel” and “organisational theory”) – 31 articles

Change Boolean phrases to: (“behaviour change” and “organisational change wheel”) = 100 articles when filtered

Behaviour change search strategy

Keywords	Boolean phrases	Databases	Inclusion criteria	Exclusion criteria	Number of articles
Organisational theory, theoretical domains framework, change management, behaviour change, feedback, surveillance, intervention, quality, qualitative research, theory	(Change and theory) and (practice and performance) and (healthcare) AND (organisational and theory) AND "behaviour change wheel" AND TITLE ("change theory" or "organisational theory")	ProQuest	Within last 10 years (2013–2023) Academic journals only English only	Non-English languages Older than 2012	**98** **2**
	(theory and qualitative research) and (behaviour change wheel and organisational theory) Behaviour change and organisational change wheel	MEDLINE	Within last 10 years (2013–2023) Academic journals only	Non-English languages Older than 2012	**31**

Appendix 12: PhD research program – Studies 1 and 2



Appendix 13: Ward round proforma

CCU DAILY PATIENT TREATMENT PLAN

DATE_____ ACS ☐

TIME_____ ARR ☐

LOS day_____ HFS ☐

PATIENT LABEL

DIAGNOSIS	
☐ ECG ☐ RHYTHM ☐ BLOODS ☐ ECHO ☐ OBS ☐ SUSPENDED MEDICATIONS	☐ ANGIO ☐ CXR ☐ HEALTHTRACK REPORT ☐ IDC ☐ OXYGEN THERAPY REQUIRED LAST 24HRS ☐ BED REST → DAY _____ Has pt been out of bed? ☐ CARDIAC REHAB/EDUCATION
PRE-WARD ROUND TREATMENT PLAN	☐ Fasting for procedure (OPTIONAL) Signed DOCTOR:_____ NURSE:_____
WARD ROUND TREATMENT PLAN	**ABOVE TREATMENT PLAN APPROVED** ☐ **DISCHARGE TODAY** ☐ ☐ Fasting for procedure ☐ Treatment plan discussed with patient Signed DOCTOR:_____
OUTSTANDING DECISIONS POST WARD ROUND	

CCU_Daily_Patient_Treatment_Plan_v1.1_31Dec2020 Page 1 of 2

MR TRIAL: CCU Ward Round

WARD ROUND PREPARATION GUIDELINES

TIME	RMO	CCU SHIFT COORDINATOR	CCU PATIENT CARE NURSE
0730hrs **Huddle**	Huddle: Board round with **CCU shift coordinator**	Huddle: Handover to Medical staff overnight patient issues.	Perform ECG's, Insulin etc Check Charts
0800hrs	Gather information for ward round. Bloods ECG and rhythm changes Echo results Angio results	Check printed ECG for quality & changes. Assist with collecting and reviewing blood results	Drug round Patient Care
0830hrs **Huddle**	Huddle: Clarify issues with **CCU patient care Nurse** Complete proforma Checklist & pre-ward round treatment plan	Assist with patients allocated to non CCU relieving nurses.	Huddle: Clarify issues with **RMO.** Complete proforma Checklist & pre-ward round treatment plan
0900hrs START WARD ROUND	RMO states treatment plan to Cardiologist and Registrar. Document any changes or additions to Tx plan on proforma	**ARR Nurse** | **ACS Nurse** | **HFS Nurse** Attends ward round and Document nursing additions on proforma. Informs patient care nurse of Tx Plan.	Patient care Post WR: • Check with WR Cardiac Nurse for update to Tx Plan, • Read Proforma Tx Plan

POST WARD ROUND TOUCH POINT GUIDELINES: Nurse/Doctor

TIME	ARR Nurse	ACS Nurse	HFS Nurse	RMO	REGISTRAR
1100HRS Touch point 1	Clarify Tx plans with RMO post ward round Handover to shift coordinator			Clarify awaiting decisions prior to leaving the CCU. Eg. CMRI, DC scripts etc.	Attends WR with Cardiologist outside of CCU
1430HRS Touch Point 2	**CCU SHIFT COORDINATOR** Clarify Tx plans with RMO			Update Nurses with current Tx plan, tests, fasting status, referrals etc	
1630hrs Touch point 3	Clarify Tx plans with REGISTRAR/CONSULTANT				Update Nurses with current Tx plan and strategy if patient deteriorates overnight.

Appendix 14: CCU staff survey

CCU Staff Survey 2021

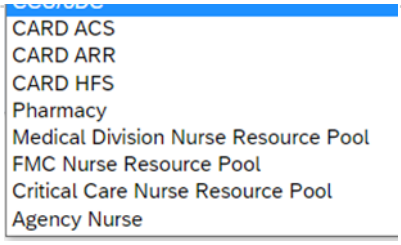
The Cardiac Care Unit at Flinders Medical Centre would like to understand your opinion about the current CCU ward round. A new ward round is being studied.
We want to compare your thoughts about the two types of ward rounds.

You will be asked to complete this survey twice. Before and after the new ward round intervention. Your insight is valuable.

This short survey should take you no more than 5 minutes to complete. We will ask you for some high-level demographic information to help us take follow-up action based on your feedback. It will not be possible to identify any individual respondent from this survey.

We appreciate your open and honest feedback so that we can make meaningful and impactful adjustments to the way we deliver patient care.

Q1 In which location, cardiac stream or resource pool are you currently rostered?



Questions 2, 3 & 4 are for Nursing staff ONLY

Answer the following questions according to your experience working in CCU during the last **2 weeks**. They relate to how well you understood which investigations and drugs your patients could receive at certain times of the day.

Q2 Please rate how well you know what investigations your patient is having and what drugs they can receive at **10am**

Not at all likely										Extremely likely
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Q3 Please rate how well you know what investigations your patient is having and what drugs they can receive at **midday**

Not at all likely										Extremely likely
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Q4 Please rate how well you know what investigations your patient is having and what drugs they can receive at **6pm**

Not at all likely										Extremely likely
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Q5 Do you think patients would benefit from a Cardiologist review twice a day?

- ○ YES
- ○ NO
- ○ Unsure

Q6 How confident do you feel about contributing to clinical decision making on the CCU ward round?

Not Confident					Somewhat Confident					Extremely Confident
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Q7 What method/s do you routinely use to update yourself on the patient treatment plan after the ward round?

You may choose more than one answer

- ☐ Wait to be informed by the RMO/Intern
- ☐ Wait to be informed by the Registrar
- ☐ Ask the Shift Coordinator
- ☐ Wait to be told by the Shift Coordinator
- ☐ Call the RMO/Intern
- ☐ Read the medical record
- ☐ Read the ward round proforma if available
- ☐ Call the Registrar

Q8 You are preparing the relevant pieces of information for the ward round. What information would you collect?

- [ ] Blood Results
- [ ] Arrival Time
- [ ] PMH of Hysterectomy/appendicectomy
- [ ] Echo results
- [ ] MRO status
- [ ] Allergies
- [ ] Family History: Mother had MI at age 70
- [ ] Angiogram results
- [ ] ECG
- [ ] Presence of Pressure sore on admission
- [ ] MRI results
- [ ] Family History: Brother had MI at age 49
- [ ] Rhythm
- [ ] Suspended Medications (those drugs for review)
- [ ] Arrival Mode: SAAS or own car

Q9 How much time do you think you need to gather all the above information for your patients on ward round?

- ○ 10 mins
- ○ 20 mins
- ○ 30 mins
- ○ Up to an hour
- ○ Longer than an hour

Q10 Within the last 2 weeks I feel all the relevant information about my patient was available on the ward round?

Please rate your response to this comment.

Never										Always
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Q11 Thank you for participating in this survey.

You are welcome to add any further comments here: (optional)

_____

_____

_____

_____

Thank you for taking the time to complete the survey.

We are currently reviewing the ward round structure.
Looking at how the CCU healthcare team communicates and collaborates with each other and the patient.

Over the next three months, you will be involved in a project that will improve the way we communicate and deliver the CCU ward round.

Anita Lymn
Clinical Nurse Researcher

Appendix 15: Patient survey

CCU Patient Ward Round Survey 2021

We in the Cardiac Care Unit at Flinders Medical Centre would like to better understand how we can best support you in our ongoing communications and collective effort to treat your cardiac illness following your first visit with the Cardiology ward round

A team of multiple doctors and possibly a nurse have met with you on the morning following your admission to hospital. This is called a ward round.

This short survey should take you no more than 5 minutes.

Only the clinical research team involved in this project will be able to identify you, however you will not be able to be individually identified when the results are shared.

We appreciate your open and honest feedback so that we can make meaningful adjustments to how we engage with you on ward round.

This survey is voluntary. Your clinical care will not be impacted should you refuse to complete it.

Q1 Please enter your current age:

_____

Q2 Please select the gender you identify as:

- Male
- Female
- Neither male or female
- Prefer not to say

Q3 Please indicate which one of the Cardiology teams saw you on ward round today?

You can ask the person providing you with this survey or your nurse if you are unsure.

- Acute Coronary Syndrome (ACS)
- Heart Failure Service (HFS)
- Arrhythmia (ARR)

On ward round, the doctors and nurses will discuss with you the best options for your treatment whilst you are in hospital.
This discussion often includes talking about the tests, procedures, medications, and education you are likely to receive to optimise your health following this cardiac illness. This is called a treatment plan.

You are free to agree or disagree with this suggested treatment plan.

We would like to measure how well you feel you understand your treatment plan as well as how long you are expected to stay in hospital.

Q4
Overall, how well do you believe you understand your treatment plan following the discussion on ward round this morning?

I don't understand my plan				I somewhat understand				I completely understand my plan		
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

As a patient, you can discuss your illness with doctors and nurses and decide together what your treatment plan will be.

The advice given to you by doctors and nurses is based on medical research evidence which helps us provide you with the best possible healthcare outcome for your cardiac illness.

We want to measure your feelings of inclusion in this decision making process during ward round.

Please consider the choices and treatment alternatives discussed with you and if you feel you had the option to decide on the treatment you will receive.

Q5 Following ward round, as a patient, did you feel included in the decisions regarding the treatment you are receiving whilst in hospital?

Not involved in any decisions				Involved in **some** decisions				Involved in **all** decisions		
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Q6 Following ward round earlier today, do you believe you know how long it is estimated that you will be in hospital for?

- Yes
- No
- Unsure

Q7 How long will you be in hospital?

- I am going home today
- 1 day
- 2 to 3 days
- 4 to 5 days
- 6 to 7 days
- Longer than a week

Q8 At this very moment, do you know if you are fasting for a procedure?

- Yes
- No
- Unsure

Q9 Do you know if you will be undergoing a procedure, scan or imaging test?

- Yes
- No
- Unsure

Q10 Do you know if you have been started on any new medications while in hospital?

- Yes
- No
- Unsure

Q11 Out of the following options. Please select the tests and procedures you know you are having following your discussion with the doctors and nurses. You may choose more than one.
If you are unsure, choose an answer that best fits your understanding.

- Blood Test
- Echo - ultrasound of your heart
- Angiogram (look at your coronary arteries)
- Stress Test (treadmill test), also called EST, ESE & DSE
- X ray
- Lung scan (CTPA or VQ scan)
- CT scan
- MRI
- Other type of ultrasound
- Pacemaker
- Procedure for an abnormal heart rhythm (Cardioversion/Ablation
- Look inside your stomach or bowel (Endoscopy/Colonoscopy)
- Other procedure not on this list

Q12 Following the ward round, how satisfied are you with your overall care in this ward?

Not satisfied at all				**Somewhat** satisfied						**Extremely** satisfied
0	1	2	3	4	5	6	7	8	9	10
○	○	○	○	○	○	○	○	○	○	○

Thank you for taking this survey.

Please speak to your nurse or doctor if you have any questions about your care.

Appendix 16: Staff intervention information sheet

STAFF INFORMATION SHEET

THE INTERVENTION

The ward round study has begun. The intervention will commence on the 19th of April 2021.

As previously discussed in the pre-intervention staff information sheet, there will be departmental changes to the CCU ward round. You are to continue your clinical responsibilities, encouraged to take part in the new ward round practice and are invited to complete voluntary surveys.

The Intervention period will commence on Monday. It will occur Monday to Friday for the next two weeks and repeat again in three 4-week cycles according to the RMO rotation through the cardiac streams.

Ward rounds are a critical part of all clinical roles and are essential to clinical care. Given this intervention will involve a temporary department-level change in the way ward rounds are conducted, it is not possible to opt-out of participating in ward round. However, you have the right to refuse to do the staff surveys that will be offered at the beginning and end of the study. Please be aware that any decision you make will not impact upon your employment at SALHN. This study has been reviewed and approved by the Southern Adelaide Clinical Human Research Ethics Committee (SAC HREC)

PRE-WARD ROUND

Ward Round Proforma (Daily Treatment Plan):

- Use as a checklist for ward round preparation
- Opportunity for the patient care nurse to update and clarify concerns with the RMO prior to the ward round.

WARD ROUND

Estimated start time is 9am, sooner if the team is prepared.

Ward round (WR)team includes: Cardiologist, Registrar, RMO, Intern and Cardiac-trained nurse.

RMO:

- Present Preliminary Treatment plan
- Ensure Treatment plans are documented on the proforma.

WR team:

- Review all CCU patients
- Discuss and formulate treatment plan together including the patient and or significant other.

WR Cardiac Nurse:

- Patient Advocate
- Handover treatment plans and nursing care issues to the patient care nurse.

POST WARD ROUND

1100hrs: Estimated time of conclusion to ward round.

- Follow up items documented on the proforma.
- The **RMO and WR nurse** clarify follow up items etc.
- The **WR nurse** will handover treatment plans and follow up items to the **CCU Nurse coordinator.**

1430hrs: RMO and **CCU Nurse coordinator** discuss the follow up requirements documented on the proforma as well as update any other issues. This includes clinical concerns etc.

1630hrs: **Cardiologist** and **Registrar** return to CCU to review CCU patients.

- Document, discuss and update treatment plans with **CCU Nurse coordinator**
- **Potential Unstable patients:**
    - Overnight treatment plans and guidelines for overnight senior support in place.

Anita Lymn
Clinical Nurse Researcher
Ph: 82044315
Email: anita.lymn@flinders.edu.au

Appendix 17: Patient information sheet and opt-out consent

Information sheet and opt-out consent

Government of South Australia
SA Health

Project Title	Cardiac Care Unit Ward Round Study
Chief Researcher	Anita Lymn, Cardiology Clinical Nurse Researcher Professor Derek Chew, Network Director of Cardiology

1 Introduction, aims and invitation:

You have been provided this form because you have been admitted to the Cardiac Care Unit (CCU) to be investigated for symptoms that relate to your heart. You will see the doctors nurses, pharmacists and other health professionals on the morning ward round. They will ask you questions about your admission to hospital and allow you to also ask them questions. They will then decide and explain the tests, procedures, and medications you will receive during your admission. You can agree or disagree with this decision. This is called a treatment plan.

We are measuring how well the doctors and nurses communicate with you during ward round. You will be asked to complete a survey that will measure your understanding of your treatment plan following the first time you see the team of doctors and nurses on the ward round.

We are measuring how well we communicate with you during the ward round as well as how much you feel involved in the discussions with your doctors and nurses at that time. We want to know if you feel you understand your initial treatment plan and a rough idea of how long you will be in hospital.

We are also investigating whether your medical team makes different and more personalised clinical decisions, provides you better information and improves your health outcomes by changing the way we deliver the ward round. Nurses are always involved in your care but may or may not be present when you see the medical team on the ward round. As such, we will be investigating if the addition of a senior cardiac nurse on ward rounds improves care and outcome for CCU patients such as you.

As such, we are asking you to allow us to look at your data to be able to answer this question. Your choice to contribute your data or not however will not affect your care or relationship with staff in any way.

2 How could this improve care and outcomes?

Ward rounds help inform the type of treatment patients receive and can affect how soon patients receive treatment. Therefore, this change in ward round may help CCU patients such as you receive medications, tests, clinical care, education, and procedures sooner, hopefully reducing the length of time you are in hospital.

3 What do we need from you?

In order to accurately answer this important question, we need access to your health and health-related data, most of which is already collected as part of your standard clinical care in hospital. This includes your name, date of birth, address, Medicare/DVA number, Indigenous status, hospital identification details, hospital administrative information, the reason for your admission, your medical and health-related assessments, treatments and outcomes. We may also ask you a few questions about your understanding of your diagnosis and satisfaction with your care whilst you're in hospital. Given that much of the required information is already routinely collected, this information sheet is providing you information about the study and giving you an opportunity to opt-out of giving the clinical research team running the investigation access to your data.

Your information will not be included in the secure CCU Ward Round study database within the first 14 days of your presentation to the emergency department. If you do not choose to opt-out within the first 14 days, your information will be included in this secure database for this investigation. You can stop contributing your data to this study at any time.

The data that we collect for this study may be used to support further studies of this nature or other studies in this area.

Please turn over page

4 Confidentiality

Your personal information is confidential, and we have procedures in place to ensure that no information which could identify you is released by our team except as required by law. Your information will be kept in a secure database and will only be accessible to the research team and authorised personnel such as your clinical care team and auditors. The results of this study are expected to be published and presented however this will be conducted in a way by which it is not possible to identify you or any other individual. Research-specific data will be kept for 15 years. Results of the investigation will not specifically be provided to participants.

5 Risks and Benefits

There are no major anticipated risks or benefits from contributing your data to this investigation.

If you should allow the research team to access your data, it will be kept in a secure database and will be treated as highly confidential information. Whilst it is expected that your data will help future people who present to the Cardiac Care Unit for possible heart problems, there are no anticipated benefits to you. You will not receive any compensation for the contribution of your data, and you do not give up any of your legal rights by contributing your data to this investigation.

6 What to do if you don't wish to contribute your data

The contribution of your data would be greatly appreciated; however, we understand that not everyone is comfortable about having their personal information analysed for research.

If you wish to opt-out of providing your data, please:

- Call the team on 0434 109 963 (please leave a message if temporarily unattended).

You will be asked to provide some basic information when you call so that we can ensure we stop data collection for the correct person. This may include your full name, date of birth and address.

7 Further information

This investigation has been reviewed and approved by the Southern Adelaide Clinical Human Research Ethics Committee (SAC HREC).

If you have any further questions, please ask to speak to the Cardiac Clinical Nurse Researcher in the Cardiac Care Unit on 8204 4315. Please call during business hours.

If you wish to discuss this study with someone not directly involved with regards to policies, your rights as a participant, or wish to make a confidential complaint, you may contact the SAC HREC executive officer on
8204 6453 or at *Health.SALHNOfficeforresearch@sa.gov.au*

Appendix 18: Ethics approval

Office for Research

Flinders Medical Centre
Ward 6C, Room 6A219
Flinders Drive, Bedford Park SA 5042
Tel: (08) 8204 6453
E: Health.SALHNOfficeforResearch@sa.gov.au

Government of South Australia

Health
Southern Adelaide
Local Health Network

Final Approval for Ethics Application

19 March 2021

Ms Anita Lymn
College of Nursing and Health Sciences
Flinders University

Dear Ms Lymn,

OFR Number: 303.20
Project title: Re-engineering the cardiology ward round to improve efficiency of care and patient-reported outcomes
Chief Investigator: Ms Anita Lymn

Ethics Approval Period: 19 March 2021 – 19 March 2024

The Southern Adelaide Clinical Human Research Ethics Committee (SAC HREC) (EC00188) has approved this application, which was first reviewed at the 14 December 2020 full committee meeting, through the greater than low risk pathway, and provided approval which meets the requirements of the *National Statement on Ethical Conduct in Human Research (2007, updated 2018)*.

You are reminded that this letter constitutes **Ethics** approval only. **Ethics approval is one aspect of the research governance process.**

You must not commence this research project at any SA Health sites listed in the application until a Site Specific Assessment (SSA), or Access Request for data or tissue form, has been approved by the Chief Executive or delegate of each site.

Public health sites approved under this application:

- Flinders Medical Centre

The below documents have been reviewed and approved:

Document	Version	Date
Human research ethics application	1	7 January 2021
Protocol	1.1	18 March 2021
Patient information sheet and opt-out consent	1.1	28 December 2020
Pre-intervention staff information sheet	1.2	19 March 2021
Intervention staff information sheet	1.2	18 March 2021
Daily patient treatment plan	1.2	18 March 2021
Patient ward round survey	1.2	12 February 2021
Staff survey	1.1	10 March 2021
Intervention presentation	1.1	10 March 2021

Ward round roles resource	1	10 March 2021

TERMS AND CONDITIONS OF ETHICS AND GOVERNANCE APPROVAL
The Principal Investigator must ensure this research complies with the National Statement on Ethical Conduct in Human Research (2018) & the Australian Code for the Responsible Conduct of Research (2007 updated 2018) by immediately reporting to the Office for Research (OFR) anything that may change the ethics or scientific integrity of the project. Final approval is granted subject to the researcher agreeing to meet the following terms and conditions:

1. Confidentiality of research participants MUST be maintained at all times.
2. If the research involves the recruitment of participants, a signed copy of the 'Consent Form' must be given to the participant. Any changes to the Participant Information Sheet/Consent Form must be approved by the lead HREC prior to being used.
3. No promotion of a study can commence until final ethics and SALHN executive approval has been obtained. All advertisements/flyers need to be approved by the committee and media contact should be coordinated through the FMC media unit.
4. Non-SA Health researchers viewing confidential SALHN data are required to complete and sign a SALHN Confidentiality Disclosure Deed
5. All approved requests for access to medical records at any SALHN site must be accompanied by this approval letter.
6. If your study involves a tertiary institution, contact the University to ensure compliance with University requirements prior to commencement of this study. This includes any insurance and indemnification.
7. The PI must adhere to Monitoring and Reporting requirements for both ethics and governance which are available on the SALHN Research Website.
8. The PI must immediately report to SAC HREC anything that may change the ethics or scientific integrity of the project
9. An annual report must be submitted to the SAC HREC and SALHN governance on each anniversary of the date of final approval. Please visit the Office for Research website for the current template.
10. Non-SA Health researchers coming onsite at SALHN must provide evidence of a recent (<3 years) screening check. It is the responsibility of the Principal Investigator to ensure any non-SA Health personnel who conducts or monitors research meets SA Health screening requirements as per the SA Health Criminal & Relevant History Screening Policy Directive before they access any SA Health site. The cost of any such screening is the responsibility of the individual accessing the site or their employer.
11. Any reports or publications derived from the research should be submitted to the Committee at the completion of the project.
12. Once the research project has concluded, any new product/procedure/intervention cannot be conducted in the SALHN as standard practice without the approval of the SALHN New Medical Products and Standardisation Committee or the SALHN New Health Technology and Clinical Practice Innovation Committee (as applicable). Please refer to the relevant committee link on the SALHN intranet for further information.
13. SALHN site-monitoring of authorised studies - this approval/authorisation is subject to participation in this monitoring process. You will be notified in advance if your site has been selected for an inspection.

Please visit the SALHN Research website regularly and comply with all submission requirements as they may change from time to time.

For any queries about this matter, please contact The Office for Research on (08) 8204 6453 or via email to Health.SALHNOfficeforResearch@sa.gov.au

Yours sincerely,

Professor Bill Heddle
Chair
Southern Adelaide Clinical Human Research Ethics Committee

Appendix 19: Governance authorisation

Office for Research

Flinders Medical Centre

Ward 6C, Room 6A219

Flinders Drive, Bedford Park SA 5042 Tel: (08) 8204 6453

E: Health.SALHNOfficeforResearch@sa.gov.au

Government of South Australia | Health Southern Adelaide Local Health Network

Final Authorisation for Governance

Mrs Anita Lymn
Cardiology Department
Flinders Medical Centre
BEDFORD PARK SA 5042

Email Contact: anita.lymn@sa.gov.au

Dear Mrs Lymn

OFR Number:	303.20
HREC reference number:	HREC/20/SAC/303.2
SSA reference number:	2021/SSA00008
Project title:	Re-engineering the cardiology ward round to improve efficiency of care and patient-reported outcomes
Principal Investigator:	Anita Lymn
Associate Investigators	Derek Chew
	Kristina Lambrakis
Governance Authorisation Date:	29/03/2021

On the basis of the information provided in your Site Specific Assessment submission, I am pleased to inform you the SALHN Chief Executive Officer or delegate has granted authorisation for this study to commence at **Flinders Medical Centre, SALHN.**

Please ensure this study meets current SA Health COVID-19 regulations before recruitment commences.

Please note that only those investigators listed above are authorised for this study based on the nature of duties performed; types of clients/patients; and the ability to access certain work locations#.

The below documents have been reviewed and approved **subject to the terms and conditions** set out on the reverse of this page:

Document	Version	Date
Site Specific Assessment Form	2021/SSA00008	22/01/2021
SAC HREC Approval Letter**	HREC/20/SAC/303.2	19/03/2021
Clinical Study Protocol	1.1	18/03/2021
FMC Participant Information Sheet/Consent • Opt-out • Pre-Intervention • Staff Information sheet	 1.1 1.2 1.2	 28/12/2020 19/03/2021 18/03/2021
Insurance Certificate of Currency	AUS20899001	31/10/20200 – 31/10/2021
Curriculum Vitae – Principal Investigator	1	11/2020

Should you have any queries about this authorisation, please contact the Office for Research on 8204 6453 or via email: Health.SALHNOfficeforResearch@sa.gov.au quoting the OFR reference number.

Yours sincerely
Main Governance Authorisation letter – SALHN researchers only, V1, 5/9/2019

Karen Saxty
Manager, Research Governance & Ethics
Date 30/03/2021

TERMS AND CONDITIONS OF ETHICS AND GOVERNANCE APPROVAL

The Principal Investigator must ensure this research complies with the National Statement on Ethical Conduct in Human Research (2018) & the Australian Code for the Responsible Conduct of Research (2007 updated 2018) by immediately reporting to the Office for Research (OFR) anything that may change the ethics or scientific integrity of the project. Final approval is granted subject to the researcher agreeing to meet the following terms and conditions:

1. Confidentiality of research participants MUST be maintained at all times.
2. If the research involves the recruitment of participants, a signed copy of the 'Consent Form' must be given to the participant. Any changes to the Participant Information Sheet/Consent Form must be approved by the lead HREC prior to being used.
3. No promotion of a study can commence until final ethics and SALHN executive approval has been obtained. All advertisements/flyers need to be approved by the committee and media contact should be coordinated through the FMC media unit.

4. Non-SA Health researchers viewing confidential SALHN data are required to complete and sign a SALHN Confidentiality Disclosure Deed
5. All approved requests for access to medical records at any SALHN site must be accompanied by this approval letter.
6. If your study involves a tertiary institution, contact the University to ensure compliance with University requirements prior to commencement of this study. This includes any insurance and indemnification.
7. The PI must adhere to Monitoring and Reporting requirements for both ethics and governance which are available on the SALHN Research Website.
8. The PI must immediately report to SAC HREC anything that may change the ethics or scientific integrity of the project
9. An annual report must be submitted to the SAC HREC and SALHN governance on each anniversary of the date of final approval. Please visit the Office for Research website for the current template.
10. Non-SA Health researchers coming onsite at SALHN must provide evidence of a recent (<3 years) screening check. It is the responsibility of the Principal Investigator to ensure any non-SA Health personnel who conducts or monitors research meets SA Health screening requirements as per the SA Health Criminal & Relevant History Screening Policy Directive before they access any SA Health site. The cost of any such screening is the responsibility of the individual accessing the site or their employer.
11. Any reports or publications derived from the research should be submitted to the Committee at the completion of the project.
12. Once the research project has concluded, any new product/procedure/intervention cannot be conducted in the SALHN as standard practice without the approval of the SALHN New Medical Products and Standardisation Committee or the SALHN New Health Technology and Clinical Practice Innovation Committee (as applicable). Please refer to the relevant committee link on the SALHN intranet for further information.
13. SALHN site-monitoring of authorised studies - this approval/authorisation is subject to participation in this monitoring process. You will be notified in advance if your site has been selected for an inspection.

Please visit the SALHN Research website regularly and comply with all submission requirements as they may change from time to time.

****HREC reviewed documents listed on the approval letter are accepted as part of the site authorisation.**

Appendix 20: Amendment to ethics approval – email for second study

Approval date: 09 Jan 2023

Dear Mrs Anita Lymn,
2021/HRE00002: Re-engineering the cardiology ward round to improve efficiency of care and patient-reported outcomes.

CPI: Mrs Anita Lymn

The amendment has been reviewed out of session and has been approved.

The following documentation is included in this approval:

- Study Protocol, CCU ward round protocol-1.2-02-DEC-2022
- Questionnaire, Follow up Staff Survey - V1.1-DOCTOR-2Dec22-1.1-02-DEC-2022
- Questionnaire, Follow up Staff Survey-V1.1-NURSE-2Dec22-1.1-02-DEC-2022
- General Amendment, Notification of an amendment to a research study - General Amendment
- Participant Information Sheet/s, WR study information and consent form-V1.0-10Nov22-1-10-NOV-2022

This approval is subject to adherence to the Terms and Conditions of ethical approval and local governance, and subject to any changes subsequently approved.

It is noted that the Southern Adelaide Clinical Human Research Ethics Committee is constituted in accordance with the *National Statement on Ethical Conduct in Human Research* (2007, updated 2018) (NHMRC).

This email constitutes ethical and scientific approval only.

Please contact us if you would like to discuss any aspects of this process further, as per the contact details below.

Yours sincerely,

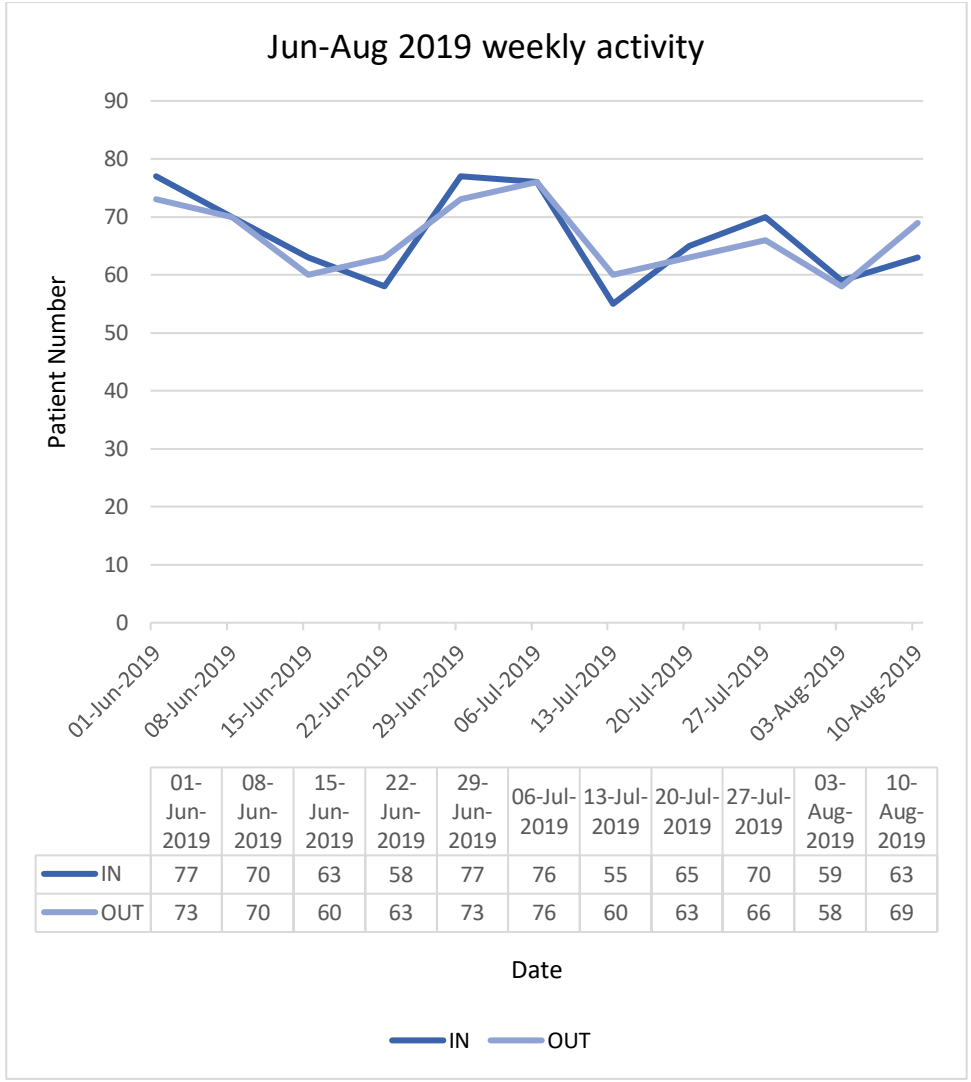
Dominic How
SAC HREC Executive Officer

on behalf of

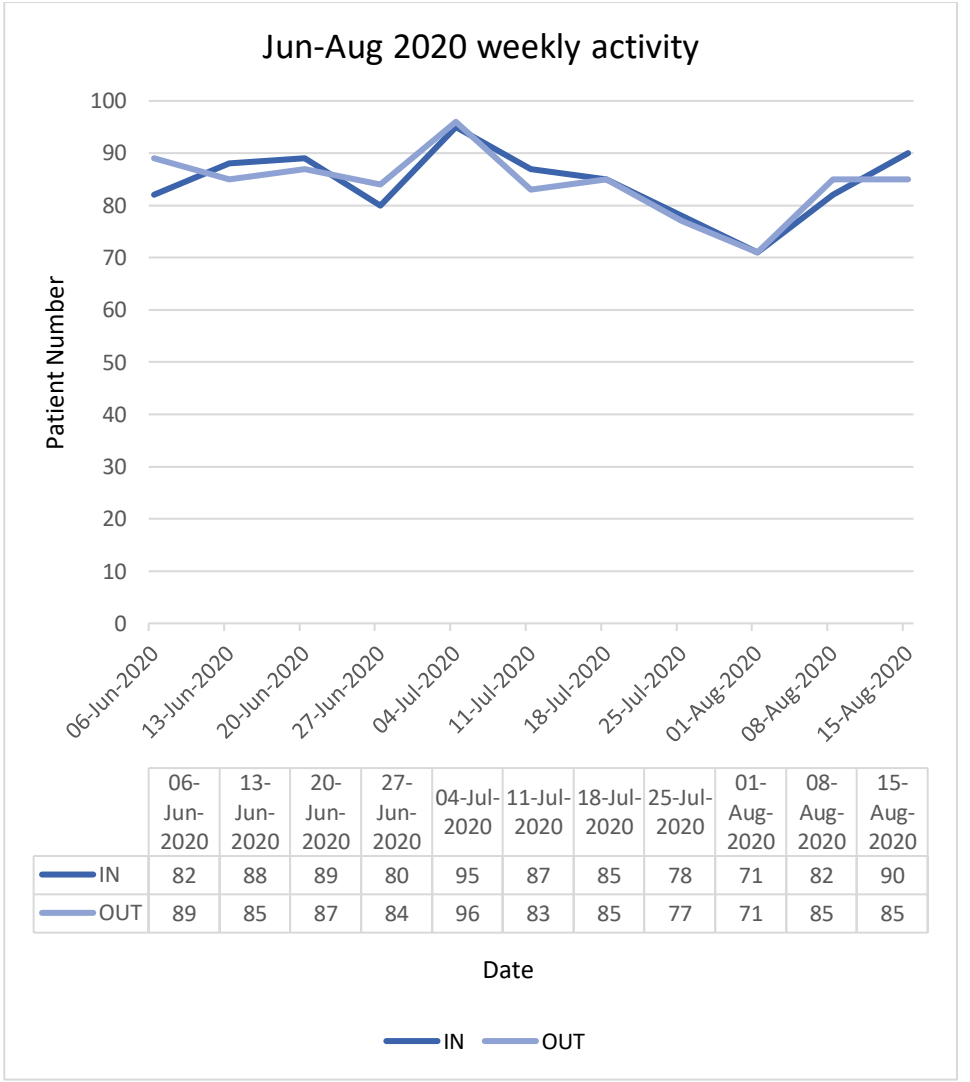
Professor Bill Heddle
Chair
Southern Adelaide Clinical Human Research Ethics Committee

Appendix 21: Changes in CCU patient admissions and discharges, 2019 to 2023

CCU weekly patient activity, comparison of June to August 2019 and 2020



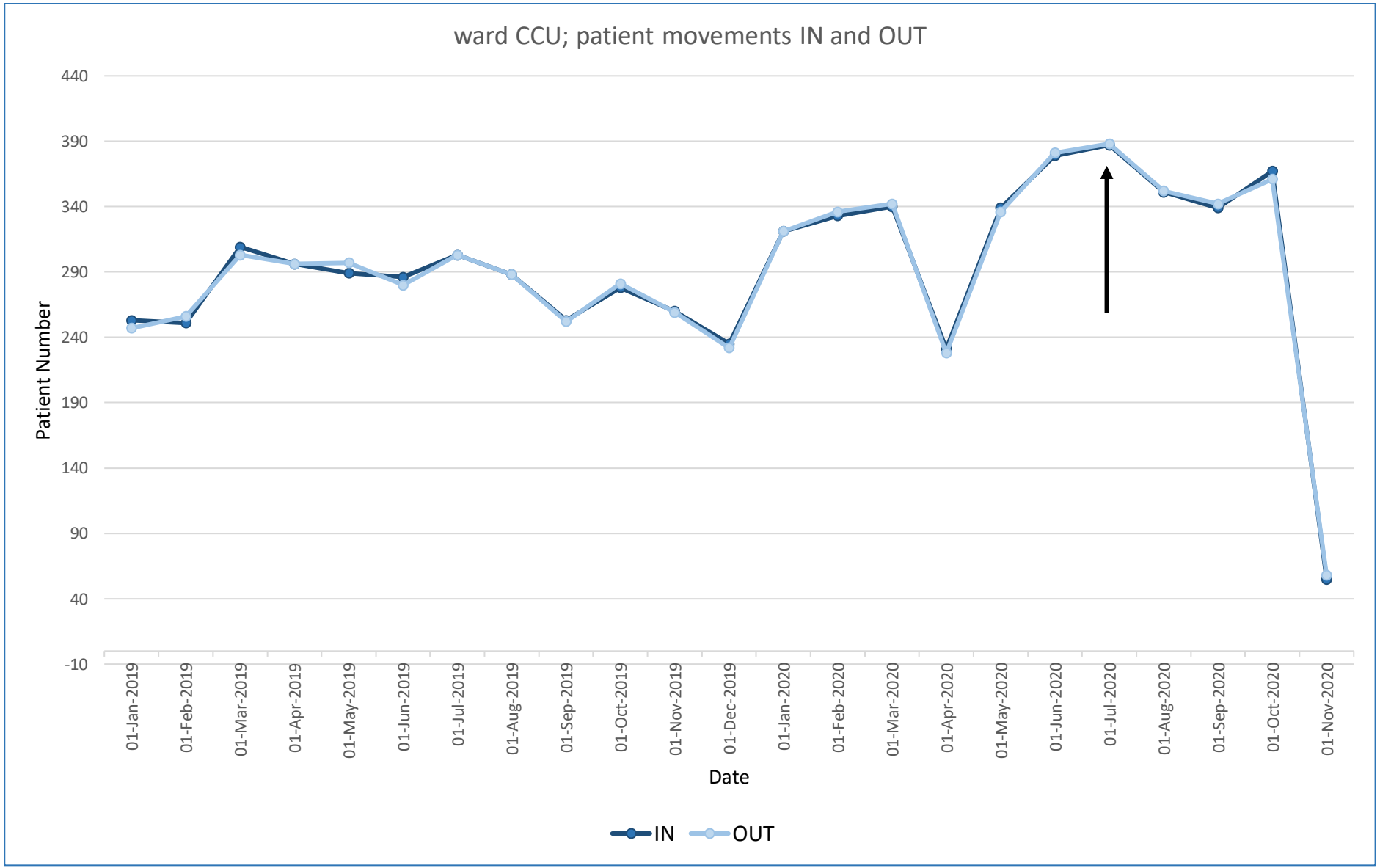
	01-Jun-2019	08-Jun-2019	15-Jun-2019	22-Jun-2019	29-Jun-2019	06-Jul-2019	13-Jul-2019	20-Jul-2019	27-Jul-2019	03-Aug-2019	10-Aug-2019
IN	77	70	63	58	77	76	55	65	70	59	63
OUT	73	70	60	63	73	76	60	63	66	58	69



	06-Jun-2020	13-Jun-2020	20-Jun-2020	27-Jun-2020	04-Jul-2020	11-Jul-2020	18-Jul-2020	25-Jul-2020	01-Aug-2020	08-Aug-2020	15-Aug-2020
IN	82	88	89	80	95	87	85	78	71	82	90
OUT	89	85	87	84	96	83	85	77	71	85	85

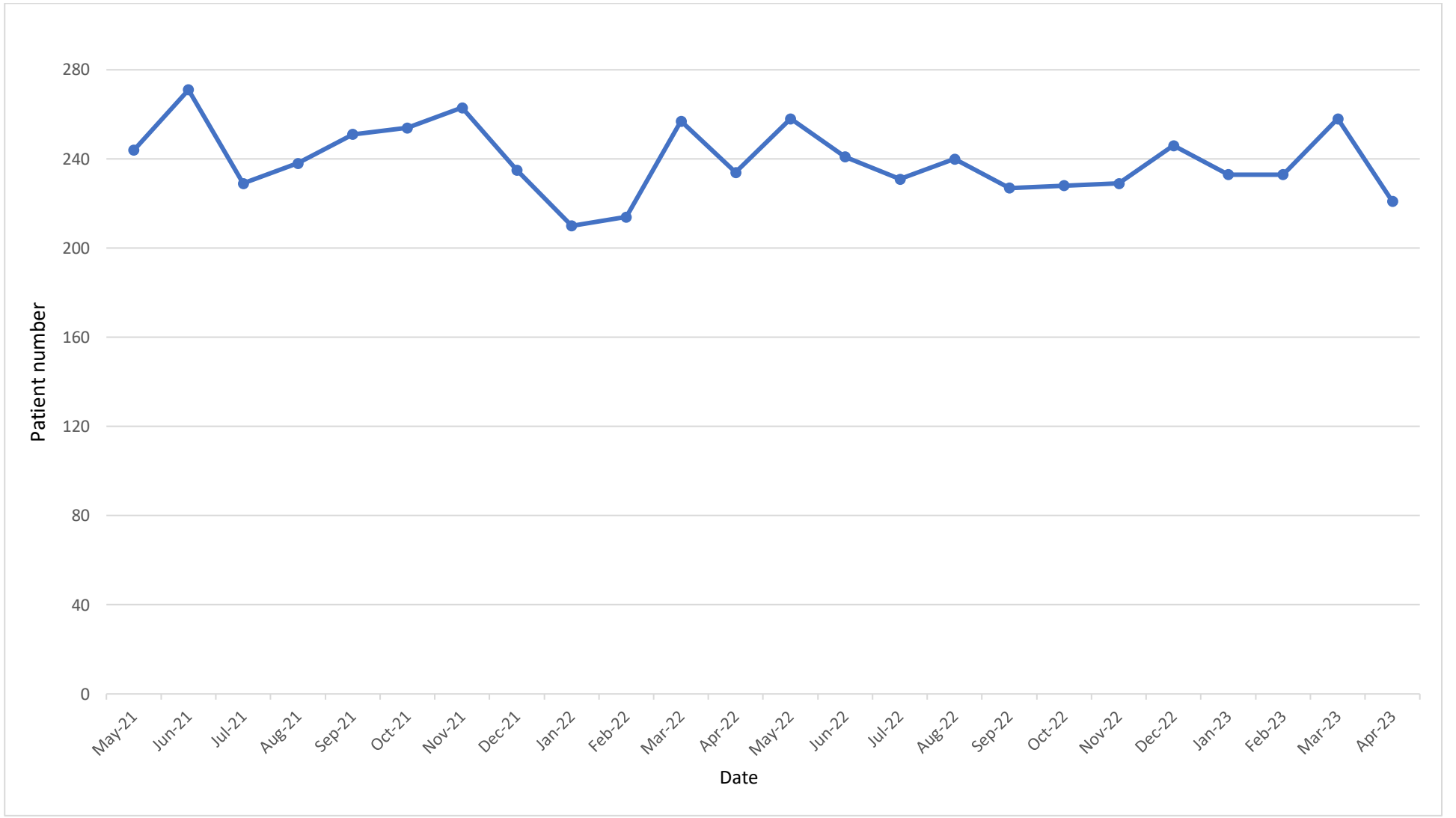
Patient activity increased by 10 to 30 extra patient movements per week since July 2019 (figures as of 16 August 2020)

Admissions and discharges to and from a CCU bed from January 2019 to November 2020

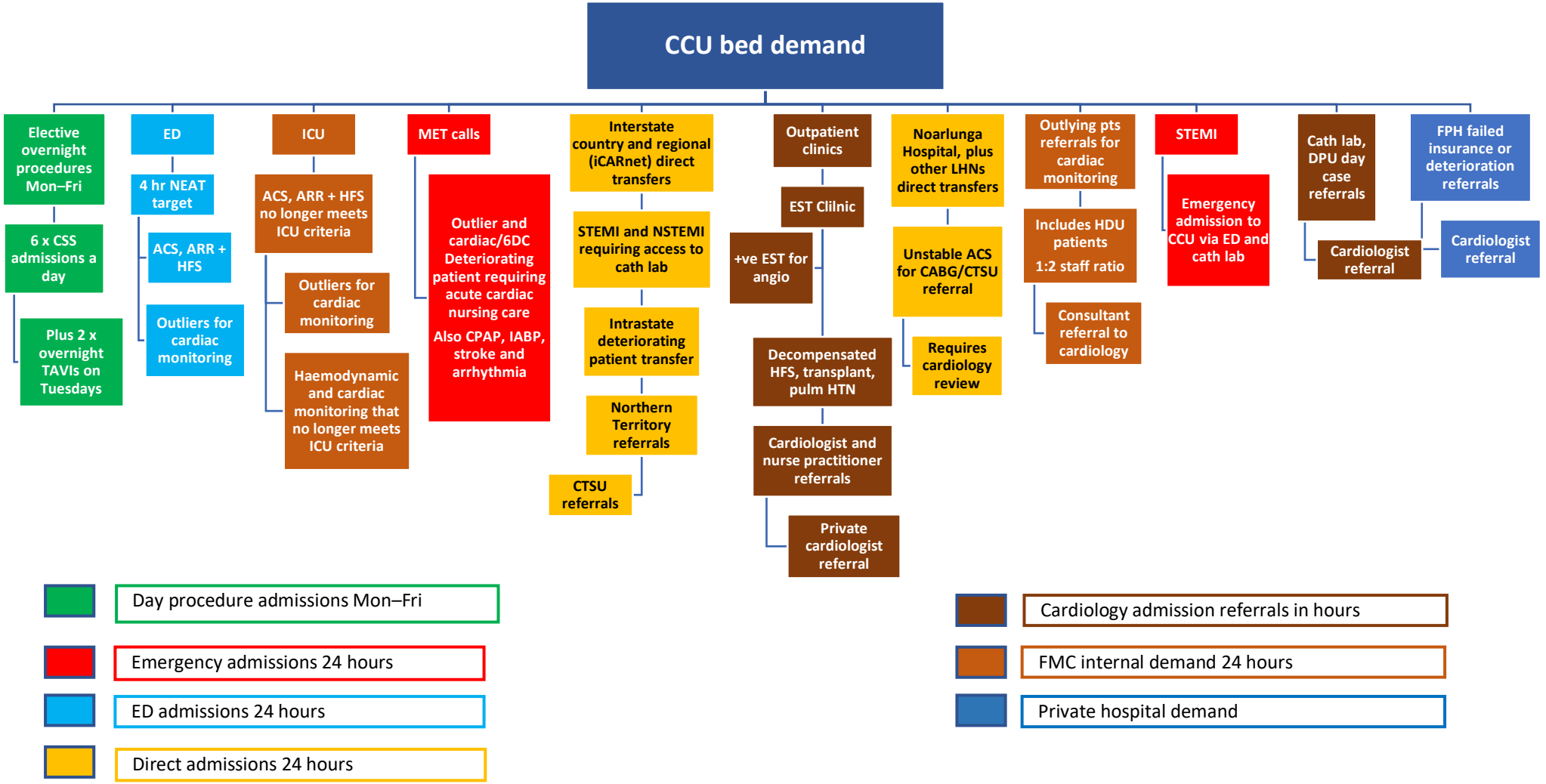


→ *= Peak patient movement in and out of a CCU bed*

CCU admissions between May 2021 to April 2023



Appendix 22: CCU bed demand – 11 access points



+ve = positive; 6DC = cardiology ward; ACS = acute coronary syndrome; angio = cardiac angiography; ARR = arrhythmia; cath lab = cardiac catheterisation laboratory; CABG = coronary artery bypass grafting; CCU = cardiac care unit; CSS = cardiac short stay; CPAP = continuous positive airway pressure; CTSU = cardiothoracic surgical unit; DPU = day procedure unit; ED = emergency department; EST = exercise stress test; FMC = Flinders Medical Centre; FPH = Flinders Private Hospital; HDU = high dependency unit; HFS = heart failure service; IABP = intra-aortic balloon pump; ICU = intensive care unit; LHN = Local Health Network; MET = medical emergency team; NEAT = National Emergency Access Target; NSTEMI = non-ST-elevation myocardial infarction; pts = patients; pulm HTN = pulmonary hypertension; STEMI = ST-elevation myocardial infarction; TAVI = transcatheter aortic valve implantation

Appendix 23: Ward round staffing before, during and after the intervention

	Ward round Feb 2021 to April 2021				Re-engineered ward round April–June 2021			
Beds open	Weekdays, Mon–Fri: **20 beds** Includes 6 x elective short stay patients plus 2 TAVIs on Tuesdays			Weekend: flexed up to **20 beds**	Weekdays, Mon–Fri: **20 beds** Increased to 6 x elective short stay patients plus 2 TAVIs on Tuesdays			Weekend: flexed up to **20 beds**
Cardiac stream	ACS	ARR	HFS	No streams	ACS	ARR	HFS	No streams
Doctors	1 x Cardiologist 1 x Registrar 1 x RMO 1 x Intern	1 x Cardiologist 1 x Registrar 1 x RMO	1 x Cardiologist 1 x Registrar 1 x RMO 1 x Intern	1 x Cardiologist 1 x Registrar 1 x RMO	1 x Cardiologist 1 x Registrar 1 x RMO 1 x Intern	1 x Cardiologist 1 x Registrar 1 x RMO	1 x Cardiologist 1 x Registrar 1 x RMO 1 x Intern	1 x Cardiologist 1 x Registrar 1 x RMO
Allocated ward round nurse	One nurse coordinator			Nurse coordinator	**EST RN**	**Nurse coordinator**	**HF nurse**	Nurse coordinator
In-hours medical cover	0800–1730: 11 x doctors from all cardiac streams			0800–1200: 1 x RMO (registrar on call)	0800–1730: 11 x doctors from all cardiac streams			0800–1200: 1 x RMO (registrar on call)
Out-of-hours medical cover	1730–0830:' 1 x RMO (registrar on call)			1200–0830: 1 x RMO (registrar on call)	1730–0830: 1 x RMO (registrar on call)			1200–0830: 1 x RMO (registrar on call)
Non-allocated patient care nurse	1 x Coordinator 1 x Clinical support 1 x EST RN 1 x EN			1 x Coordinator 1 x Clinical support 1 x EST RN 1 x EN	1 x Coordinator 1 x Clinical support 1 x EST RN 1 x EN			1 x Coordinator 1 x Clinical support 1 x EST RN 1 x EN
Number of nurses rostered	8			7	8			7
Nursing hours	Early: 0700–1530 Late: 1300–2130 Night: 2100–0730			Early: 0700–1530 Late: 1300–2130 Night: 2100–0730	Early: 0700–1530 Late: 1300–2130 Night: 2100–0730			Early: 0700–1530 Late: 1300–2130 Night: 2100–0730
Daily exercise stress test clinic	1 x EST RN (senior) 1x EN 0700–1530			1 x EST RN (senior) 1x EN 0700–1530	1 x EST RN (senior) 1x EN 0700–1530			1 x EST RN (senior) 1 x EN 0700–1530

	Ward round Feb 2021 to April 2021	Re-engineered ward round April–June 2021
Problem	• NUM busy managing bed demands and staffing issues for CCU 20 beds and 6DC 12 beds, unable to attend ARR ward round • Only one coordinator available to attend ward round • All ward rounds often occur simultaneously • Streams leave and return, breaking up the ward round • Splitting the stream ward round in two (i.e. RMO and registrar see patients separately after the cardiologist has left or before the cardiologist has arrived on weekends) • Cardiologist does not see all stream patients, relying on registrar to see all patients • The registrar arrives on the weekend at 0630hrs and starts their own ward round, bypassing nurse presence	• Difficult to replace nurse on ward round if EST or HF nurse unavailable/sick leave • Medical staff compliance to see all patients in CCU at one time was variable • Occasionally medical staff would still split the stream ward round in two • Post-ward round huddles did not always occur as planned according to workload demands and poor compliance • Cardiologist did not always see all the ACS or ARR patients • HF stream was the most consistent with the cardiologist mostly seeing all their patients
Innovation	• Original plan when streaming was introduced in 2014: • Asked HF stream to do the 6DC ward round first before starting in CCU • NUM attended ARR ward round since 2014 (usually fewer patients)	• Re-engineered ward round implemented in 2-week rotations for 12 weeks: • EST RN requested to attend an ACS or ARR stream ward round prior to starting EST clinic on weekdays (coordinator could allocate ARR or ACS) • HF nurse, heart transplant and pulmonary HT nurse rostered to attend HF stream ward round in CCU for 5 weekdays for each intervention fortnight

	Ward round from June 2021 to February 2023			
	Weekday			Weekend
Beds open	**20 beds** Includes 6 x elective short stay patients plus 2 TAVIs on Tuesdays			Flexed up to **20 beds**
Cardiac stream	ACS	ARR	HFS	No streams
Doctors	1 x Cardiologist 1 x Registrar 1 x RMO 1 x Intern	1 x Cardiologist 1 x Registrar 1 x RMO	1 x Cardiologist 1 x Registrar 1 x RMO 1 x Intern	1 x Cardiologist 1 x Registrar 1 x RMO
Allocated ward round nurse	One nurse coordinator			Nurse coordinator
In-hours medical cover	0800–1730: 11 x doctors from all cardiac streams			0800–1200: 1 x RMO (registrar on call)
Out-of-hours medical cover	1200–0830: 1 x RMO (registrar on call)			1200–0830: 1 x RMO (registrar on call)
Non-allocated patient care nurse	1 x Coordinator 1 x Clinical support			1 x Coordinator 1 x Clinical support 1 x EST RN (separate roster)
Number of nurses rostered	8			7
Nursing hours	Early: 0700–1530 Late: 1300–2130 Night: 2100–0730			
Problem	• NUM now busy managing bed demands and staffing issues for CCU 20 beds and 6DC 12 beds, unable to attend any ward round • Only one coordinator available to attend ward round • All ward rounds often occur simultaneously • Streams leave and return, breaking up the ward round • Splitting the stream ward round in two (i.e. RMO and registrar see patients separately after the cardiologist has left or before the cardiologist has arrived on weekends • Cardiologist does not see all stream patients, relying on registrar to see patients • The registrar arrives on the weekend at 0630hrs and starts their own ward round, bypassing nurse presence			
Innovation adopted from ward round study	Cardiologists and registrars delegate RMO's to speak with nurse coordinators. Mobile phone for nurse coordinators enables text messages with registrars Some registrars and cardiologists engage with nurse coordinator if they cannot get onto the ward round			
Exercise stress test clinic	1 x EST RN in EST phone follow up clinic Monday, Wednesday, Friday			None

6DC = cardiology ward; ACS = acute coronary syndrome; ARR = arrhythmia; Clinical support = senior cardiac nurse provides bedside support for junior nurses, advanced life support qualified for patient transport and acute care of deteriorating patients CCU = cardiac care unit; EN = enrolled nurse; EST = exercise stress test, separate roster; HF = heart failure; HFS = heart failure service; NUM = nurse unit manager; pulmonary HT = pulmonary hypertension; RMO = resident medical officer; RN = registered nurse; TAVI = transcatheter aortic valve implantation

Appendix 24: CCU nurse staffing – nurse to patient ratios, 2017–2023

	2017						2018–2019					
Beds open	Weekday Mon–Fri: **20 beds** Includes 4 x elective short stay patients			Weekend: **16 beds** (excludes short stay elective admissions)			Weekday Mon–Fri: **20 beds** Increased to 6 x elective short stay patients plus 2 TAVIs on Tuesdays			Weekend: **16 beds** (4 beds closed)		
Shift	Early shift	Late shift	Night shift	Early shift	Late shift	Night shift	Early shift	Late shift	Night shift	Early shift	Late shift	Night shift
Number of nurses rostered	6	6	3	5	5	3	6	6	4	5	5	4
Senior nurses rostered	2	2	1 or 2*	2	2	1 or 2*	2 (3 on Tues)	2	2	2	2	2
Non-allocated patient care nurse	1 x Coordinator	1 x Coordinator	1 x Coordinator	1 x Coordinator	1 x Coordinator	1 x Coordinator	1 x Coordinator **D shift start** 1000hrs	1 x Coordinator **D shift** finishes at 1800hrs	1 x Coordinator	1 x Coordinator	1 x Coordinator	1 x Coordinator
Nurse to patient ratio (nurse:patient)	1:4	1:4	1:10	1:5	1:4	1:8	1:4 Tues 1:2	1:4 Tues 1:2	1:7, 1:7, 1:6	1:4	1:4	1:6, 1:7, 1:7
Problem	Concerns regarding unsafe levels of staffing levels on night duty						• Increasing acuity and bed demands, flexing up to 20 beds on weekends, requiring relievers most shifts • Cardiac nurse educator not replaced • Cardiac nurse attrition: 9 senior cardiac nurses have left the unit or retired early, with a further 6 trained and transition nurses indicating intention to leave • Increased relieving non-cardiac-trained nurses • Reduction in senior cardiac nurse resources • Elective short stay patients increased to 6 per day • 2 x elective TAVI patients on Tuesdays, extra nurse allocated 1:2 • Concerns regarding unsafe staffing levels on all shifts, especially night duty (1:8, 1:10 not viable with CCU overnight activity)				
Innovation	**Implemented D shift in 2018, 1000–1800hrs, for clinical support and to cover coordinator meal breaks**						**Staffing trial: Increase night duty to 4 staff**					
Daily exercise stress test clinic	1 x EST RN (senior) 1x EN 0800–1630			1 x EST RN (senior) 1x EN 0800–1630			1 x EST RN (senior) 1x EN 0800–1630			1 x EST RN (senior) 1x EN 0800–1630		

	2020–2021 Staffing trial						2022–2023 (post staffing agreement)					
Beds open	Weekday Mon–Fri: **20 beds** Includes 6 x elective short stay patients plus 2 TAVIs on Tuesdays			Weekend: flexed up to **20 beds**			Weekday Mon–Fri: **20 beds** Increased to 6 x elective short stay patients plus 2 TAVIs on Tuesdays			Weekend: flexed up to **20 beds**		
Shift	Early shift	Late shift	Night shift	Early shift	Late shift	Night shift	Early shift	Late shift	Night shift	Early shift	Late shift	Night shift
Number of nurses rostered	**8**	**7**	**5**	**7**	**6**	**5**	8	7	**4** **Need to request 5**	7	6	**4** **Need to request 5**
Senior nurses required	2 (3 on Tues)	2 (3 on Tues)	2	2	2	2	2 (3 on Tues)	2 (3 on Tues)	2	2	2	2
Non-allocated patient care nurse	1 x Coordinator 1 x Clinical support	1 x Coordinator 1 x Clinical support	1 x Coordinator	1 x Coordinator 1 x Clinical support	1 x Coordinator 1 x Clinical support	1 x Coordinator	1 x Coordinator 1 x Clinical support	1 x Coordinator 1 x Clinical support	1 x Coordinator	1 x Coordinator 1 x Clinical support	1 x Coordinator 1 x Clinical support	1 x Coordinator
Nurse to patient ratio	**1:3, 1:3, 1:3, 1:3, 1:4, 1:4**	**1:4**	**1:5**	**1:4**	**1:5**	**1:5**	1:3, 1:3, 1:3, 1:3, 1:4, 1:4	1:4	**1:7, 1:7, 1:6**	1:4	1:5	**1:6, 1:7, 1:7**
Problem	• Increasing acuity • No cardiac nurse educator (extra shifts from ANUM 1 day a week) • **COVID-19 impact** • Outlier admissions increased • Buying beds in Flinders Private Hospital (FPH) for most of the cardiac short stay patients • Cardiac nurse attrition continuing • NUM resigned/retired early						• Ongoing COVID and bed demand issues • Buying beds for short stay and other cardiac patients in FPH • High activity, bed turnaround and acuity • **Removed 5th nurse on night duty**. Have to request 5 on a needs basis despite 20 admitted patients. Corporate nursing often unable to supply 5th nurse for night duty due to short supply of casual staff secondary to COVID. Double shifts commonplace. • **By 2022**: Removed EST EN and EST RN clinic cover from 7 days to 3 days a week, Mon, Wed, Fri • **Double shifts commonplace**. Nurses work above FTE to compensate for COVID staff shortages.					
Innovation	**Staffing negotiation intensifying: Trial commenced late 2020 until agreement** • An extra nurse on each shift • Created a clinical support nurse for the early and late shifts midweek • Extra nurse on night duty to cover 20 beds • Changed EST nurses' hours to start on the early shift						Nurse educator (ICU background) support provided 1 day a week **New NUM appointed by February 2022** **Enrolled nurse removed from EST clinic.** **EST clinic became a phone follow up service since COVID** **EST's still performed**					
Daily exercise stress test clinic	1 x EST RN (senior) 1x EN 0700–1530			1 x EST RN (senior) 1x EN 0700–1530			1 x EST RN (senior) Mon, Wed, Fri					

ANUM = Associate nurse unit manager; CCU = cardiac care unit; EN = enrolled nurse; EST = exercise stress test; FTE = full-time equivalent; ICU = intensive care unit; NUM = nurse unit manager; RN = registered nurse; Staff ratios calculated for 20 patients: for example on night shift three nurses share 20 patients; 2 nurses care for 7 patients each and one nurse cares for 6 patients, TAVI = transcatheter aortic valve implantation,

** prefer two senior cardiac nurses rostered every shift and three when performing TAVI procedures*

Appendix 25: Staff interview questions

INTERVIEW QUESTIONS: DOCTOR

State date, day of the week and time.
I am going to ask you questions will related to your experience on last week's ward round.

DEMOGRAPHICS

1. What is your occupation?
2. Which cardiac stream did you belong to in the past week?

ROLE DESCRIPTION

3. Could you please describe your role on the ward round?

WARD ROUND STRUCTURE

4. In the past week, how many CCU ward rounds have you attended?
5. How many times was a nurse present on the ward round?
6. Do you think a nurse needs to be on the ward round?

- ○ Always (1)
- ○ Sometimes (2)
- ○ Rarely (3)
- ○ Prefer not to say (4)

Why do you think this?

7. How much do you agree with the following statement:
   All cardiac stream CCU patients should be seen in one sitting before leaving to see other stream patients in the rest of the hospital.

- ○ Agree (1)
- ○ Somewhat Agree (2)
- ○ Slightly Agree (3)
- ○ Disagree (4)
- ○ Prefer not to say (5)

Why do you think this?

8. How much do you agree with the following statement:
   The Cardiologist needs to attend the entire ward round.

○ Agree (1)

○ Somewhat Agree (2)

○ Slightly Agree (3)

○ Disagree (4)

○ Prefer not to say (5)

Why do you think this?

9. How many ward rounds did you attend with a Cardiologist on the entire ward round?
10. Do you use a checklist on the ward round to keep track and remind you of the required information for the individual patient?

COMMUNICATION AND COLLABORATION

IN HOURS

11. How much do you agree with the following statement:
    The doctors and nurses need to get together regularly, outside of the ward round to update patient treatment plans.

○ Agree (1)

○ Somewhat Agree (2)

○ Slightly Agree (3)

○ Disagree (4)

○ Prefer not to say (5)

Why do you think this?

12. Did you speak to the nurse to update the patient treatment plan outside of the ward round. If so, how many times do you do this during the shift?

AFTER HOURS:

13. How much do you agree with the following statement:
    The doctors need to do a paper round, to update patient treatment plans, with the CCU nurse coordinator before they go home.

○ Agree (1)

○ Somewhat Agree (2)

○ Slightly Agree (3)

○ Disagree (4)

○ Prefer not to say (5)

Why do you think this?

14. In the past week: How many times did you speak with the nurses to update treatment plans before you went home – approx. 1630–1730hrs?

SITUATIONAL AWARENESS

PATIENT BEDSIDE

15. How confident do you feel about speaking up if you disagree with the treatment plan on ward round.

- ○ Extremely confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say (4)

16. SCENARIO: The ward round team is discussing the patient treatment plan on the ward round, in front of the patient. The patient wants to go home tomorrow. They are told to stay in hospital for at least 2 days and have tests. On the ward round the nurse asks the patient to indicate their understanding and acceptance of this decision;

"Mr X, the doctors want to do a procedure on you tomorrow, you will have to stay in hospital for another two days, do you understand what this means for you?"
The patient realises they are staying in hospital for 2 more days and becomes upset.
How do you feel about the nurse discussing this with the patient in front of you and potentially changing the treatment plan?
What do you think you would do about this?

17. The nurse is also concerned about a cardiac drug that is on hold and they feel it needs to be given to the patient.

    What do you do about it?

NURSES STATION

SCENARIO: You are discussing the patient treatment plan about a patient at the nurses station. A nurse raises concerns about the decisions and questions the treatment plan for this particular patient.

18. How do you feel about this?
19. What do you do about it?

DECISION MAKING

OFF THE WARD ROUND

I want to know about your confidence in making clinical decisions **OFF** the ward round.
Remembering that you are happy to take responsibility for your decisions.
Do you make the following clinical decisions in your daily practice without immediately referring to a senior member of the team? (You might discuss it with them after you have actioned your decision)

20. Holding a medication that you believe is detrimental for that particular patient at that time.

○ Extremely confident (1)

○ Somewhat confident (2)

○ Slightly confident (3)

○ Prefer not to say (4)

21. Would you recommence a cardiac medication that has been on hold because you believe the patient needs that drug.

○ Extremely confident (1)

○ Somewhat confident (2)

○ Slightly confident (3)

○ Prefer not to say (4)

22. Would you **instruct** the nurse to remove IDC's, oxygen and IV cannulas that you believe the patient does not need.

○ Extremely confident (1)

○ Somewhat confident (2)

○ Slightly confident (3)

○ Prefer not to say (4)

23. Would you **cease** cardiac monitoring when you consider the patient does not need cardiac monitoring anymore.

○ Extremely confident (1)

○ Somewhat confident (2)

○ Slightly confident (3)

○ Prefer not to say (4)

24. **Tell** the patient care nurse to mobilise/sit out of bed when you believe the patient should not stay in bed.

○ Extremely confident (1)

○ Somewhat confident (2)

○ Slightly confident (3)

○ Prefer not to say

25. Decide to let the patient be transferred to Xray **without a cardiac monitor**.

- ○ Extremely confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say (4)

26. **Fast** the patient for a procedure that you believe the patient may require.

- ○ Extremely confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say (4)

27. **Initiate** patient education according to individual patient needs.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

ON THE WARD ROUND

Would any of these decisions change if you were **ON** the ward round able to discuss them at the time with the team.

28. Holding or recommencing cardiac drugs

- ○ Yes
- ○ No

29. Removing IDC's, oxygen, IV cannula

- ○ Yes
- ○ No

30. Cease cardiac monitoring

- ○ Yes
- ○ No

31. Ensure patient gets out of bed

- ○ Yes
- ○ No

32. Non-monitor transfer

- ○ Yes
- ○ No

33. Initiate Fasting patient

- ○ Yes
- ○ No

34. Initiating patient education

- ○ Yes
- ○ No

FREE COMMENTS

35. Do you have anything you would like to say regarding the CCU ward round?

INTERVIEW QUESTIONS: NURSE

State date, day of the week and time.
I am going to ask you questions will related to your experience on last week's ward round.

DEMOGRAPHICS

36. What is your occupation?

ROLE DESCRIPTION

37. Could you please describe your role on the ward round?

WARD ROUND STRUCTURE

38. In the past week, how many CCU ward rounds have you attended?
39. Did you allocate another nurse to attend any other cardiac stream ward round?
40. Can you tell me which cardiac streams they were?
41. Do you think a nurse needs to be on the ward round?

- ○ Always (1)
- ○ Sometimes (2)
- ○ Rarely (3)
- ○ Not at all disagree (4)

Why do you think this?

42. How much do you agree with the following statement:
All cardiac stream CCU patients should be seen in one sitting before leaving to see other stream patients in the rest of the hospital.

- ○ Agree (1)
- ○ Somewhat Agree (2)
- ○ Slightly Agree (3)
- ○ Disagree (4)
- ○ Prefer not to say (5)

Why do you think this?

43. How much do you agree with the following statement:
The Cardiologist needs to attend the entire ward round.

- ○ Agree (1)
- ○ Somewhat Agree (2)
- ○ Slightly Agree (3)
- ○ Disagree (4)
- ○ Prefer not to say (5)

Why do you think this?

Do you use a checklist on the ward round to keep track and remind you of the required information for the individual patient?

COMMUNICATION AND COLLABORATION

IN HOURS

44. How much do you agree with the following statement:
    The doctors and nurses need to get together regularly, outside of the ward round to update patient treatment plans.

- ○ Agree (1)
- ○ Somewhat Agree (2)
- ○ Slightly Agree (3)
- ○ Disagree (4)
- ○ Prefer not to say (5)

Why do you think this?

45. On an Early shift, did you speak to the doctor to update the patient treatment plans outside of the ward round, during the shift? If so how many times?

AFTER HOURS

46. How much do you agree with the following statement:
    The doctors need to do a paper round, to update patient treatment plans, with the CCU nurse coordinator before they go home.

- ○ Agree (1)
- ○ Somewhat Agree (2)
- ○ Slightly Agree (3)
- ○ Disagree (4)
- ○ Prefer not to say (5)

Why do you think this?

47. How many times did you speak with the doctors to update treatment plans before they went home – approx. 1630–1730hrs?
48. Was this a Registrar or a Cardiologist?

- ○ Cardiologist (1)
- ○ Registrar (2)

SITUATIONAL AWARENESS

PATIENT BEDSIDE

49. How confident do you feel about speaking up if you disagree with the treatment plan on ward round.

- ○ Extremely confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say (4)

50. SCENARIO: The ward round team is discussing the patient treatment plan on the ward round, in front of the patient. The patient wants to go home tomorrow. They are told to stay in hospital for at least 2 days and have tests. You are concerned the patient does understand and accept this decision.
How do you advocate for you patient?

51. SCENARIO: You are on the ward round. You are concerned about a cardiac drug on hold on the medication chart that you feel the patient needs to receive.
What do you do about it?

NURSES STATION

SCENARIO: You are discussing the patient treatment plan on the ward round, away from the patient. You are concerned about the decisions regarding the treatment plan for this particular patient (eg. they want to attend their daughter's wedding tomorrow, but an MRI is booked on Monday and the doctors want to keep the patient in hospital over the weekend).

52. How do you advocate for you patient and What do you do about it?

53. What do you do if the doctor defers the decision to another more senior doctor?

DECISION MAKING

OFF THE WARD ROUND

I want to know about your confidence in making clinical decisions **OFF** the ward round.
Remembering that you are happy to take responsibility for your decisions.
Do you make the following clinical decisions in your daily **practice without immediately referring to a senior member of the team**? (You might discuss it with them after you have actioned your decision)
How confident do you feel;

54. **Holding** a medication that you believe is not required for that particular patient.

- ○ Extremely confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say (4)

55. Speaking to the doctor to **recommence** a cardiac medication that has been on hold because you believe the patient needs that drug.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

56. How confident do you feel making the decision to routinely **remove** IDC's, oxygen and IV cannulas that you believe the patient does not need.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

57. **Cease** cardiac monitoring when you consider the patient does not need cardiac monitoring anymore.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

58. **Tell** the patient care nurse to mobilise/sit out of bed when you believe the patient should not stay in bed.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

59. Decide to let the patient be transferred to xray **without a cardiac monitor**.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

60. **Fast** the patient for a procedure that you believe the patient may require.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

61. **Initiate** patient education according to individual patient needs.

- ○ confident (1)
- ○ Somewhat confident (2)
- ○ Slightly confident (3)
- ○ Prefer not to say

ON THE WARD ROUND

Would any of these decisions change if you were **ON** the ward round able to discuss them at the time with the team.

62. Holding or recommencing cardiac drugs

- ○ Yes
- ○ No

63. Removing IDC's, oxygen, IV cannula

- ○ Yes
- ○ No

64. Cease cardiac monitoring

- ○ Yes
- ○ No

65. Ensure patient gets out of bed

- ○ Yes
- ○ No

66. Non-monitor transfer

- ○ Yes
- ○ No

67. Initiate Fasting patient

- ○ Yes
- ○ No

68. Initiating patient education

- ○ Yes
- ○ No

FREE COMMENTS

69. Do you have anything you would like to say regarding the CCU ward round?

Appendix 26: CCU staff information sheet/consent form

CCU Staff Information Sheet/Consent Form

Project Title	**CCU Ward Round Study: 1-year follow-up review**
Chief Researchers	Anita Lymn, Cardiology Clinical Nurse Researcher
	Professor Derek Chew, Professor of Cardiology
	Professor Robyn A Clark, SALHN Director of Nursing & Midwifery Research

1 Introduction, aims and invitation

You have been provided this information sheet and consent form because you work in the Cardiac Care Unit (CCU) as a doctor or a nurse.

Last year, April to June 2021, we implemented an intervention that made structural changes to the CCU ward round.

The results showed that there is a clinically and statistically significant improvement in the administration of timely cardiac medications when a nurse attends the stream ward round ($p=0.012$ for the ACS and ARR streams and $p<0.001$ for the HF stream). More patient inclusion in the bedside discussions and clinically improved communication and collaboration between doctors and nurses also improved fasting times, patient mobility and patient education plus other key clinical indicators.

We want to revisit the current CCU ward round and find out if there have been any changes since the intervention last year.

As such, we are asking you to answer a few questions via an interview. This interview will be recorded for analysis purposes.

Whether you choose to participate in the interview or not, will not affect your employment at SALHN or your relationship with the staff in any way.

Cardiology medical and nursing management are aware of this project. The interviews will be conducted during work time.

2 What do we need from you?

You will be invited by the Clinical Nurse Researcher to conduct a short, 10 to 15 minute interview that will ask you some questions about your experience with the ward round and proceeding communication and collaboration activities over the week.

3 What do I have to do?

If you wish to participate in this study, you just need to sign this consent form and let the research staff know.

The consent form is sent securely to the Department of Human Services who holds this information confidentially.

If you choose to consent, your information will be included in the secure Cardiac ward round study database. But, if you do not choose to consent your information will not be included in this secure database for this investigation. If you do consent and change your mind, you can stop contributing your data to this study at any time.

The data that we collect for this study may be used to support further studies of this nature or other studies in this area.

4 Do I have to take part in this research project?

Participation in any research project is voluntary. If you do not wish to take part, you do not have to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage.

If you do decide to take part, you will be given this Participant Information and Consent Form to sign and you will be given a copy to keep.

Your decision whether to take part or not to take part, or to take part and then withdraw, will not affect your routine treatment, your relationship with any staff working at Flinders Medical Centre.

5 What if I withdraw from this research project?

You can withdraw from this research project at any time. If you choose to withdraw, please contact the Clinical Nurse Researcher or the team on 0434 109 963. (Please leave a message if temporarily unattended). Any existing data collected will not be used.

You will be asked to provide some basic information when you call so that we can ensure we stop data collection for the correct person. This may include your full name and occupation.

6 Who is organising and funding the research?

This study has been designed by and is being conducted by the Investigators of this study who are clinical and research experts in cardiology.

The Clinical Nurse Researcher, Anita Lymn, the primary investigator, is a senior cardiac nurse that works in CCU and 6DC. She is doing her PHD in Cardiovascular Nursing through the College of Nursing and Health Sciences at Flinders University in collaboration with Flinders Medical Centre.

7 Who has reviewed the research project?

All research in Australia involving humans is reviewed by an independent group of people called a Human Research Ethics Committee (HREC). The ethical aspects of this research project have been approved by the Southern Adelaide Clinical and Human Research Ethics Committee.

This project will be carried out according to the National Statement on Ethical Conduct in Human Research (2007). This statement has been developed to protect the interests of people who agree to participate in human research studies

8 Confidentiality

Your personal information is confidential, and we have procedures in place to ensure that no information which could identify you is released by our team except as required by law. Your information will be kept in a secure database and will only be accessible to the research team and authorised personnel such as your clinical care team and auditors. The results of this study are expected to be published and presented however this will be conducted in a way by which it is not possible to identify you or any other individual. Research-specific data will be kept for 15 years. Results of the investigation will not specifically be provided to participants.

9 Risks and benefits

There are no major anticipated risks or benefits from contributing your data to this investigation.

If you should allow the research team to record this interview, it will be kept in a secure database and will be treated as highly confidential information. Whilst it is expected that your data will help future people who present to 6DC and the Cardiac Care Unit for possible heart problems, there are no anticipated benefits to you. You will not receive any compensation for the contribution of your data, and you do not give up any of your legal rights by contributing your data to this investigation.

The researchers do not expect the questions to cause any harm or discomfort to you. However, if you experience any feelings of distress as a result of participation in this study, please let your researcher know immediately.

10 Further information

This investigation has been reviewed and approved by the Southern Adelaide Clinical Human Research Ethics Committee (SAC HREC).

If you have any further questions, please ask to speak to the Cardiac Clinical Nurse Researcher in the Cardiac Care Unit on 8204 4315. Please call during business hours.

If you wish to discuss this study with someone not directly involved with regards to policies, your rights as a participant, or wish to make a confidential complaint, you may contact the SAC HREC executive officer on
8204 6453 or at *Health.SALHNOfficeforresearch@sa.gov.au*

Consent Form

Adult providing own consent.

Title	CCU Ward Round Study: 1-year follow-up review
Principal Investigator	Anita Lymn
Site	Flinders Medical Center

Declaration by Participant

I have read the Participant Information Sheet, or someone has read it to me in a language that I understand.
I understand the purposes, and risks of the research described in the project.
I give permission for my answers to the interview questions to be recorded and analysed for the purposes of this project. I understand that such information will remain confidential.
I have had an opportunity to ask questions and I am satisfied with the answers I have received.
I freely agree to participate in this research project as described and understand that I am free to withdraw at any time during the study without affecting my future health care.
I understand that I will be given a signed copy of this document to keep.

Declaration by Investigator/Authorised delegate[†]

Participant Name (please print):		
Participant Signature:	Date:	Time:

I have given a verbal explanation of the research project; its procedures and risks and I believe that the participant has understood that explanation.

Name of Investigator/Authorised delegate[†] (please print):		
Investigator/Authorised delegate[†] signature:	Date:	Time:

[†] A senior member of the research team must provide the explanation of, and information concerning, the research project.

Note: All parties signing the consent section must date their own signature.

Appendix 27: Ward round interview coding book

Name	Description
Attendance	
Attended all ward rounds	
Attended some ward rounds	
Cardiologist attends a partial ward round	
Doctor opinion Cardiologist attends a partial ward round	Doctors' opinion about the need for a cardiologist seeing all the patients
Nurse opinion Cardiologist attends a partial ward round	How nurses feel about the cardiologist not seeing all the patients
Senior opinion Cardiologist attends partial ward round	Tertiary teaching hospital provides advanced trainees (registrars) opportunity to learn. Cardiologist always available and has ultimate responsibility. Supervisor role
Cardiologist attends the whole ward round	
Doctor opinion Cardiologist sees patients	How doctors feel about the cardiologist staying on the entire ward round
Nurse opinion Cardiologist sees all patients	Nurses want the cardiologist to see all their patients on the ward round
Senior opinion Cardiologist see all patients	Opinions for cardiologist to stay on the ward round
Nurse attends a partial ward round	
Nurse attends the whole ward round	
Doctors want nurses on the ward round	Why do doctors want nurses on the ward round
Nurses want to be on the ward round	Why do nurses want to be on the ward round
Nurses did not attend any ward rounds	
Streams complete ward round before leaving CCU	
Doctor opinion Stream seeing all CCU patients	Doctors' opinion about the team staying in CCU to see all the patients
Nurse opinion Stream seeing all CCU patients	How nurses feel about the team leaving CCU to see other patients around the hospital before completing the CCU ward round
Value nurses on the ward round	An expression by doctors that they feel nurses should attend the ward round
Ward round stream leaves the unit with ward round incomplete	The ward round is broken/fractured with streams leaving CCU to see other patients around the hospital and then return later to complete the ward round, often without the cardiologist and the stream splits into RMO and registrar ward rounds
Checklist use	Exploring how staff remember patient needs

Name	Description
Communication	
Doctors actively seek nurses	Communicate ward round decisions
Doctors do not seek nurses	
Nurses do not seek doctors	
Nurses need doctors to seek them	
Nurses need to seek doctors	Nurses chasing doctors for information
Concerned comments	
Doctor concerns	
Nurse concerns	
Culture and teamwork	Subthemes required for feeling valued, belonging to the team and feeling respected
Belonging	
Do not feel as though they belong on the ward round	Nurses have expressed this in the interviews
Do not feel valued	
Feel valued	
Do not feel respected	
Respected	
Education	Staff are learning while on the ward round
Ward round is a learning environment	
Empowerment	Situational awareness exists so that doctors and nurses feel they can speak up and make suggestions about the patient's treatment
Expertise	Level of confidence when making decisions both medical and nursing
Intern viewpoint	Appreciate teamwork for decision making and having a nurse available
Less experienced nurse coordinator's opinion	Less confident to speak up
Senior expertise	Doctors and nurses revealing decision-making skills
OFF the ward round	
Board rounds	
Huddles	
Update at the end of the day	Cardiologist or registrar or RMO will update the nurse coordinator re overnight treatment plan
Positive comments	
Nurse positive comments	
Doctor positive comments	

Name	Description
Quality	Quality patient care delivery
Safety	Patients receive safe and appropriate care
Trust	Feeling trusted by the team, as well as the patient trusting the team
Ward round role description	Each person expresses their interpretation of what they must do on the ward round
Doctor's role	
All members of the ward round team understand the treatment plan	
Assist with decision making	
Communicating with other specialties	Other doctors and medical teams and allied health staff
Documentation of the ward round discussion	RMOs and interns see themselves in this role. Writing orders for medications, tests etc., documenting the planned treatment plan
Examining the patient	
Lead the ward round structure	Determine which patients will be seen by the cardiologist
Patients understand the treatment plan	
Provide instructions to junior doctors	The registrar mostly sees themselves in this role
See all the patients on ward round	
See only new patients	Cardiologist only wants to see the new patients
Supervisor role	
Ultimate responsibility	Ensure all members of the team agree with the patient treatment plans
Write orders for drugs and tests etc.	
Nurse's role	
Communicate patient issues and clinical concerns	
Conduit to ensure timely delivery of care is provided to the patient	
Follow doctors	
Listen to ward round conversation	The conversation does not always correlate with what is documented
Needs to be a part of the ward round team	
Provide instructions to the bedside nurse	Let the patient care nurses know about changes to medications, plans for tests and update patient care requirements
Provide nursing information	
Wait to be asked for nursing input	

CCU = cardiac care unit; RMO = resident medical officer

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