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Addressing medication records management in Australian aged care

From Doctoral research to validation by CSIRO ON Prime

Maryam Sassoli and Luke Houghton

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ABOUT THIS PUBLICATION

This report is published by the Centre for Work, Organisation and Wellbeing at Griffith University. It presents findings from doctoral research examining the post-discharge medication (PDM) process in Australian aged care. The research was further validated and extended through participation in the CSIRO ON Prime program, strengthening its practical relevance and industry engagement.

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Executive summary

This report presents comprehensive findings from doctoral research on the post-discharge medication (PDM) process in Australian aged care, validated and extended through the CSIRO ON Prime program. The research addresses a critical patient safety challenge: systematic failures in medication information transfer and coordination as elderly patients are discharged from hospitals to residential aged care facilities (RACFs), a challenge that requires collaboration between hospital discharge teams, RACF nursing staff, general practitioners, and community pharmacies to ensure accurate, timely medication provision.

Through a systematic literature review (2022-2024) examining 58 peer-reviewed studies from 2,042 initial articles, combined with qualitative fieldwork involving 12 registered nurses and 5 pharmacists, this research documented a 72.6 per cent medication discrepancy rate per 100 medications transferred between healthcare settings (Makeham et al., 2020). These failures contribute to about 27,569 potentially avoidable hospital admissions from RACFs annually, incurring costs of $312 million (Australian Medical Association, 2021).

Thesis research findings:

The doctoral research documented the complete PDM process through 96 hours of direct observation in two community pharmacies and detailed interviews with healthcare professionals, including pharmacists and registered nurses. The research revealed:

- Four major PDM process stages with multiple sub-stages, each representing potential failure points
- Seven critical challenge themes are: Time significance, Communication/Translation, Collaboration, Knowledge/Skills, Legislation, Workplace safety, and Medication wastage.
- Time operates as a powerful non-human actor: patient arrivals during medication rounds disrupt workflows; GP review times vary (2-4 hours working hours vs. 4-6 hours after-hours); afternoon pharmacy orders create time pressure
- Medication information acts as a central actant: Information transforms 6+ times from hospital record to patient administration, with each transformation representing error risk
- Software fragmentation prevents network stabilisation: Each RACF uses different software; pharmacies must use multiple incompatible systems; manual re-entry is required at every interface

The research applied Essomenic (EM) modelling and Actor-Network Theory (ANT) to visualise and interpret the PDM process. This dual-lens approach revealed that healthcare processes are not merely sequences of tasks performed by humans, but complex networks of heterogeneous actors—both human and non-human—constantly negotiating, translating, and transforming to achieve (or fail to achieve) stable medication service delivery.

The CSIRO ON Prime validation study engaged 65 stakeholders across the healthcare ecosystem, including RACF managers, hospital pharmacists, community pharmacists, and aged care nurses, confirming that these problems persist and are intensifying. Stakeholders identified three essential requirements: interconnected software systems for seamless data exchange, adequate staffing and training resources, and standardised protocols across facility types.

1. The critical problem: Understanding the context

This report covers a very important context of elderly patients in aged care facilities, not having their proper medication dispensed. The results can be catastrophic: Patients in these facilities are sometimes very ill; as a result of communication errors, they can spend extended periods in the hospital unnecessarily and, in some cases, pass away. This research tackles the very important problem of how to dispense medication safely and recommends tackling the basic problems using approaches from simple checklists to artificial intelligence tools to provide minimum viable continuity for this process to reduce these devastating effects.

1.1 Demographic context and population aging

In October 2022, the World Health Organisation reported that the global aging population will increase from 1 billion in 2020 to 1.4 billion by 2030, which means 1 in 6 people worldwide will be aged 60 years or over. By 2050, this population will double to approximately 2.1 billion (World Health Organisation, 2022).

As of June 2020, approximately 4.2 million individuals (16 per cent of the total population) in Australia were aged 65 and over, according to Field (Australian Institute of Health and Welfare, 2023). Projections show this will reach 6.66 million by 2041, constituting 20 per cent of the total population Field, (Centre of Excellence in Population Ageing Research, 2023). The Australian Institute of Health and Welfare (2018) reported that about 59 per cent of people aged 65 or overuse residential aged care facility services. Furthermore, they projected that approximately 80 per cent of older individuals will use government-funded aged care services before passing.

1.2 Polypharmacy and medication complexity

Older adults face heightened vulnerability because of age-related physiological changes and polypharmacy. Research evidence shows that nearly 90 per cent of older adults regularly take at least one prescription drug, with 80 per cent using at least two, and 36 per cent relying on five or more different prescription medications (Elliott, 2006; Ruscin & Linnebur, 2021). Nursing home residents typically take 7-8 medications daily, with some individuals requiring up to 12-15 different medications.

1.3 The scope and scale of medication management failures

Systematic Literature Review Findings:

A comprehensive mapping review examined 2,042 initial articles from three major databases (CINHAL, ProQuest, Scopus), ultimately selecting 58 studies that met rigorous inclusion criteria for analysis of the post-discharge medication process.

Theme	Number of Studies	Geographic Distribution
Medication Management Cycle	9 studies	Australia (7), UK (2)
Medication Incidents	13 studies	Australia (5), USA (4), Sweden (2), Others (2)
Medication Information Communication	17 studies	USA (6), Australia (3), Sweden (2), Others (6)
Interventions for Improvement	12 studies	Canada (2), Norway (2), USA (2), Others (6)
Medication Administration in RACFs	7 studies	Switzerland (2), Others (5)

Table 1: Distribution of 58 Selected Studies by Theme and Geography

Critical Statistics from Literature:

- 72.6 per cent medication discrepancy rate per 100 medications transferred (1,777 total discrepancies documented) (Makeham et al., 2020)
- 49 per cent of discharge summaries contain inaccurate or omitted medication data
- 27,569 potentially avoidable hospital admissions from RACFs estimated by June 2021, costing $312 million annually (Australian Medical Association, 2021)
- 10 per cent of older adults' hospital admissions globally linked to medication-related harm (Parekh, Ali, Page, Roper, & Rajkumar, 2018)
- Medication management was identified as the primary cause of complaints to the Aged Care Complaints Commissioner

2. Research methodology and empirical findings

2.1 Methodological approach

The research employed an interpretive, qualitative methodology grounded in social constructionism. Data collection combined direct observation with semi-structured interviews to capture both observed practices and participants' interpretations of those practices. This approach aligns with recommendations for studying complex healthcare processes, where formal procedures often differ substantially from actual practice.

2.1.1 Participant demographics

Work Experience	Total RNs	Age Range	Total RNs
0 to 1 year	3	21-30 years	6
1 to 3 years	1	31-40 years	4
3 to 5 years	2	41-50 years	1
5 to 10 years	5	51-60 years	1
More than 10 years	1	60+ years	0
Total	12	Total	12

Table 2: Demographics of 12 Interviewed Registered Nurses

Five pharmacists and one pharmacy technician were interviewed (average interview length: 45 minutes, total: 4.14 hours). An extended observation was conducted in community pharmacies serving aged care facilities, documenting medication preparation and dispensing processes.

2.2 Empirical findings from thesis research

2.2.1 The PDM process in current practice

Through 96 hours of direct observation in two community pharmacies and interviews with healthcare professionals, the research documented the complete PDM process, revealing four major stages with multiple sub-stages:

Stage 1: Patient Arrival at RACF

- Expected: Hospital RN should notify RACF 2-3 hours before arrival
- Reality: Often no advance notification; paramedics arrive without verbal handover
- Challenge: Arrivals during medication rounds or mealtimes disrupt workflows; after-hours arrivals face longer wait times

Stage 2: GP Notifying and Review

- Process: RN faxes/emails discharge summary to GP, then calls to confirm receipt
- GP Review Time: Working hours: 2-4 hours; After-hours with locum: 4-6 hours
- Challenge: Time differential creates patient safety risks; locum GPs are unfamiliar with patient history

Stage 3: Community Pharmacy Processing (5 sub-stages)

- A. Patient medication information arrival (fax/email/online platform)
- B. Pre-preparation steps for medication dispensing
- C. Medication packing/preparing (4 different types: sachets, Webster packs, blister packs, bottles)
- D. Quality control of prepared medication (approaches vary by pharmacy)
- E. Medication departure and delivery

Stage 4: Medication Arrival and Administration at RACF

- RN receives delivery, unpacks, cross-checks against printed charts, allocates to medication trolley, administers to patient, records in Medi-sphere

2.2.2 Seven critical challenges identified

Challenge 1: Time Significance

- Time emerged as a powerful non-human actor affecting every PDM stage. Timely medication administration is essential for efficacy; delayed/missed doses lead to medication errors, confusion, unintentional double dosing, and health risks.

Challenge 2: Communication/Translation

- Central challenge: While healthcare practitioners communicate well interpersonally, medication information is not being translated effectively into practice. Manifests at various interface levels between hospitals, pharmacies, and RACFs.

Challenge 3: Collaboration

- Lack of collaborative frameworks across organisational boundaries. Each organisation operates in isolation with its own procedures, software, and documentation requirements.

Challenge 4: Knowledge, Skills, and Human Resources

- Staff unfamiliarity with digital health systems; insufficient training time; high turnover requiring continuous retraining, and lack of technical support.

Challenge 5: Legislation

- Multiple legislative requirements across different jurisdictions create complexity. S8 medications have immutable handling requirements.

Challenge 6: Software Fragmentation

- Most critical technological challenge: Each RACF uses different software; pharmacies must use multiple incompatible systems; no synchronisation capability—requires manual re-entry at every interface point, increasing error risk and time.

Challenge 7: Others

- Workplace health and safety, medication wastage, dynamic processes, stock/medication availability.

2.2.3 Theoretical analysis: Essomenic and Actor-Network Theory

The research applied a complementary theoretical approach, integrating Essomenic (EM) modelling as a visual tool with Actor-Network Theory (ANT) as a social theory lens.

2.2.3.1 What is Essomenic (EM) and why?

The EM is a graphically based communication tool in healthcare which used mainly in hospital settings to outline the patient's movement, interaction with various service providers, steps and activities involved in the patient's care (J. M. Curry, C. McGregor, & S. Tracy, 2006). This modelling tool simplifies a complex process by defining the process in layers (defined in Table3) and describing who and what is involved at each layer. Figure 1 presents the graphical symbols used in the EM tool to explain each person's roles, tasks, and activities in a patient journey model.

Layer name	Content description
Patient movement	Presents when, where and how many times patients are transferred or associated with treatment during their journey
Staff roles	Presents what doctors, nurses, pharmacists, specialists and other healthcare providers took place or were involved in the journey
Processes	Names and relates the practical handling processes involved in the journey
Communication/ information creation/ information updates	Presents information communication and flow of information as paperwork to systems that are required by the processes to be created
Equipment/resources	Various devices are used in the process.
Policies/ legislation/ strategic objectives	Names the policies/ legislation/ strategic objectives that must be adhered to during the enactment of the processes
Metrics	Details of the measurements that are used to determine the effectiveness of the stakeholder journey

Table 3: Essomenic layer description

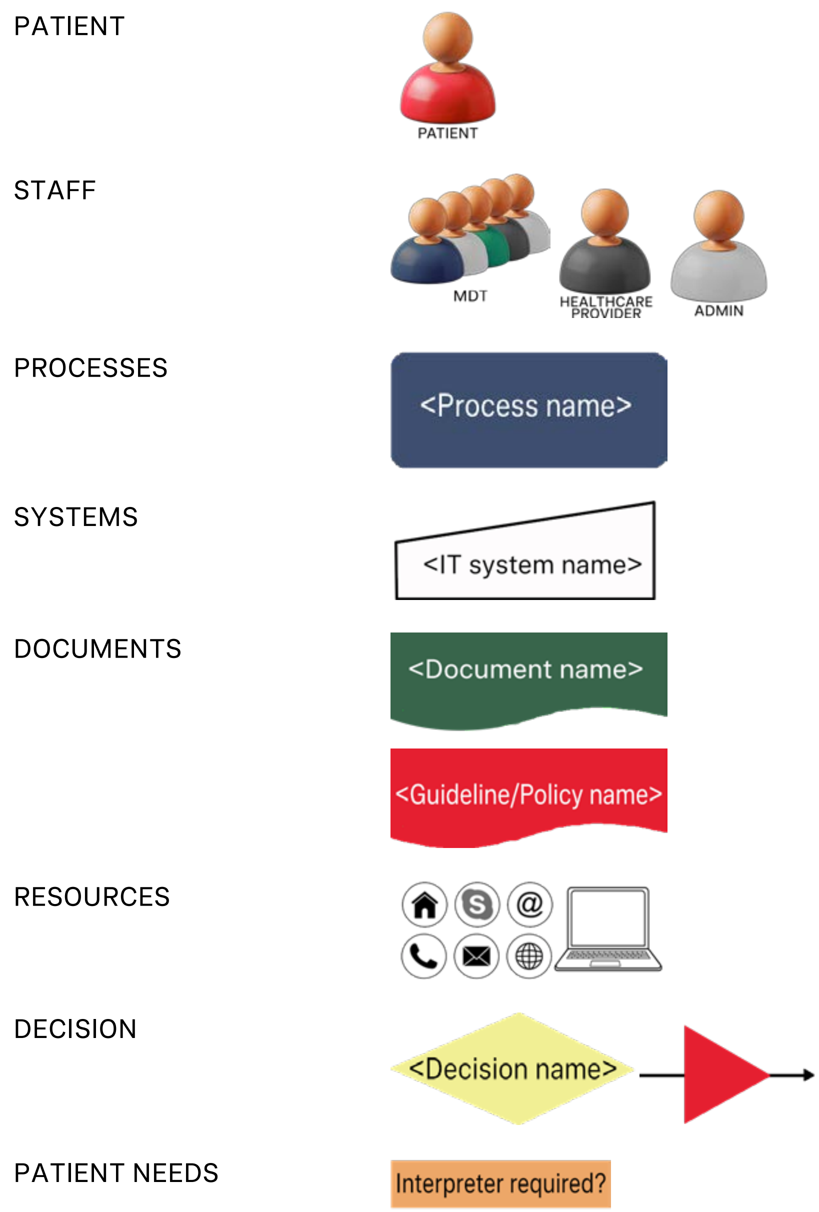


Figure 1: Essomenic Architecture

EM is a patient journey modelling approach originally adapted from business process modelling and developed specifically for healthcare (Anneke Fitzgerald & Dadich, 2009; Ben-Tovim et al., 2008; J. Curry, C. McGregor, & S. Tracy, 2006). Healthcare improvement projects have widely used it, and it has demonstrated positive outcomes. EM functions as a graphical communication tool that maps patient movements, interactions with service providers, and care-related activities, supporting the design of safe and high-quality patient journeys (Börzel, 1998; Thatcher, 1998; Walt et al., 2008).

In this research, the Essomenic Model is used to analyse the patient medication information journey from hospital to RACFs and to inform improvements. EM visually represents a patient movement within and across healthcare organisations, enabling clear tracking of interactions in real work settings. This approach helps reduce unnecessary activities, eliminate duplicated communication, and improve clarity of information (Anneke Fitzgerald & Dadich, 2009; Curry, Fitzgerald, Prodan, Dadich, & Sloan, 2014; Sayvong & Curry, 2016). As a result, EM provides a structured means to identify risks, target safety and quality improvements, and confirm assumed process patterns (Munzner, 2014) from a new analytical perspective.

2.2.3.2 What is Actor-Network Theory (ANT) and why?

The complexity of the post-discharge medication (PDM) process, together with the need to account for translation processes involving both human and non-human entities, underpins the use of Actor–Network Theory (ANT), or the sociology of translation, as the analytical framework for this study. The PDM process is inherently complex and involves actors from multiple organisational sectors, including hospital registered nurses, RACF registered nurses, paramedic teams, and community pharmacists, as well as non-human entities such as medication information (e.g. discharge medication summaries, medication charts, and prescriptions), medications themselves, and communication technologies. These heterogeneous actors collectively form a dynamic network in which roles, relationships, and responsibilities strengthen over time.

ANT, developed by Bruno Latour, Michel Callon and others since the 1980s (Bilodeau & Potvin, 2018), focuses on how connections among objects and people create networks that, when stabilised, create a 'macro actor' or an 'institution' (Czarniawska, 2017; Fenwick & Edwards, 2012; Langley & Tsoukas, 2016). In ANT, both actors and actants play important roles in shaping social networks. A network forms when the connections among the actions of actants become stable (Porsander, 2005). This network theory influences the concept of non-human actors and the interplay between entities with agency, human and non-human actors, as well as relationships shaped by negotiations and interactions. When these interactions stabilise, they form a network or institution.

ANT assumes symmetry between human and non-human actors, recognising that both have agency and can shape actions, decisions, and outcomes. What actors and actants do, rather than what they are, defines them. Repeated actions that yield predictable outcomes turn an actant into an actor (Czarniawska, 2017, p. 2). This perspective allows material objects, technologies, documents, and information to be analysed alongside people as active contributors to practice.

ANT has been widely applied as both a theoretical and methodological approach across disciplines (Scott & Wagner, 2003), particularly in healthcare research (Figueiro et al., 2017). It has been used to analyse health informatics (Cavalcante et al., 2019; K. Cresswell, Worth, & Sheikh, 2011; K. M. Cresswell, Worth, & Sheikh, 2010), healthcare services (Ivanova, Wallenburg, & Bal, 2016), multidisciplinary decision-making (Dew, 2016), technology implementation (Dupret & Friborg, 2018), quality improvement initiatives (Allen, 2016; Turner et al., 2018), and organisational change (Bode, Dent, & Vinot, 2014). These studies show the value of ANT in tracing interactions between human and non-human actants and in revealing how their relative influence shapes network formation, stability, and outcomes in practice.

Central to ANT is the concept of translation (Aka, 2019), which explains how actors align interests and form networks (Callon & Blackwell, 2007; Czarniawska & Hernes, 2005). Problematisation, where a problem is defined and an obligatory passage point is established, is one of four interrelated moments through which translation occurs; translation is an ongoing and fragile process that may succeed or fail, and networks can destabilise if alignments are not maintained.

The PDM process involves two distinct types of translation: knowledge transfer and translation, as well as translation in ANT; they are different. The first translation is related to knowledge transfer (patient medication information from the hospital to RACF and community pharmacy) and the second one is translation in ANT. According to Carlile (2004), knowledge transfer within an organisation is referred to as "knowledge transfer" (Szulanski, 1996; Winter, 1987), is based on the concept of "transfer", which underlies the information approach. This concept defines the relationship between the sender and receiver at the organisational boundary (Transferring or processing knowledge across boundaries, known as interphases in this study, can be a challenging task). During the transition stage of knowledge transfer, new actors emerge and provide interpretations Field (Carlile, 2004). The interpretive differences and dependencies highlight the role of specific individuals as brokers and translators who facilitate the flow of knowledge (Carlile, 2004, p. 558) This process involves actors at the pragmatic level, where knowledge undergoes transformation (Carlile, 2004). This perspective aligns with the actor-network approach, which views this transformation as a process of translation (Czarniawska & Hernes, 2005; Fenwick & Edwards, 2012; Porsander, 2005, p. 19). In this process, objects can also become actors, as translation emerges from collaborative practices and exchanges. The concept of translation emphasises that an actor's functional competency, identity, and ability to act in different ways are not inherent conditions (Cypher, 2017).

The second one, translation in ANT, as described by Latour (1996) and Callon (1984), refers to the process through which actors and actants establish connections and alliances with each other. Stabilisation of the connection highly depends on the process of translation. This means that different and separate actors constantly negotiate and adjust their social characteristics, then create a new relationships between heterogeneous elements. The heterogeneity is characterised by diversity and multiplicity of actors (Latour, 1983). This and the inspirational quote from Czarniawska (2017, p. 164) "How do things, people and ideas become connected and assembled in larger units?", led us to develop and think about how the heterogeneous actors involved in the post-discharge medication (PDM) process act and interact to shape a network via various translations.

In ANT, translation occurs through four interrelated moments: problematisation, interessement, enrolment, and mobilisation. In the initial phase of problematisation, a problem is defined, and a solution is proposed, which requires other entities to engage. This phase establishes an obligatory passage point, which all actors must pass through to achieve their interests as defined by the focal actor. Interessement follows, during which identified entities decide whether to accept or reject participation in the proposed network based on their interests. Enrolment occurs when roles are defined and accepted, and actors agree to interact within the network; however, enrolment may be undermined by betrayal if actors do not adhere to agreed roles or representations. Mobilisation is the final stage, in which the network stabilises, and representatives or delegates speak on behalf of other actors, reducing controversy within the network.

Across these four moments, both human and non-human actors may function as intermediaries, mediators, or immutable mobiles. Intermediaries facilitate connections between actors, mediators actively modify or transform actions and roles, and immutable mobiles remain stable as they move across different contexts and settings.

Translation in ANT is a dynamic, ongoing process through which an actor-network is formed, often examined from the perspective of a focal actor. Network stabilisation depends on the durability of relationships achieved during mobilisation; however, translation is never fully complete and may fail, leading to network collapse. Within the PDM process, artefacts such as prescriptions act as active components that translate medication information into patient care. The PDM process, therefore, comprises interconnected networks and subnetworks across organisations, within which multiple translations continuously occur.

Thus, viewing these translations through the lens of translation theory, the overall process can be described as follows:

Moments (when?)	How to do?	What to do?
Problematisation	The transmission of medication information and transformation to medication issues need to be identified in the current PDM process and then the solution to be introduced	• issue: transmitting the patient's medication information from the hospital to RACF, • solution: provide accurate medication information within the time frame to RACF for aiming at patient clinical care, • actors: hospital and RACF nurses, staff, medication information, communication technology tools
Interessement	The medication information and medication define different obligatory passage points to lock the actors into the PDM process	• Several social and technical adjustments related to the clinical care pathway of the patient. • Technical adjustment: a combination of utilising technology (such as software or web-based applications) and paper-based medication information (script written by a doctor or patient discharge summary, or patient medication summary) work/ interact/ interconnect together to transfer/exchange medication information within and between healthcare organisations • Rhetorical closure: convincing several healthcare providers from different healthcare organisations that the transparency of patient medication information is key to reducing the number of re-admission rates and medical errors related to medication errors.
Enrolment	The PDM process assigns the role to allies to stabilise the character of the medication information and medication	• Healthcare service providers: Doctors of hospitals and GPs of RACFs, RNs of hospitals and RACFs, Hospital and community pharmacists, Staff who work in hospitals, RACFs and pharmacies and are involved in the PDM process. • Regulators: Ministry of Health regulations, hospital and RACFs government regulators, Australian Government aged care quality and Safety department, medication management policy and regulations, time
Mobilisation	The network of the PDM process stabilised and acted with minimal errors	• Spokesmen: The patient received the right medication and the right dose at the right time

Table 4: Translation momentum in the PDM process

Through data interpretation, the four moments of translation allow examination of how subnetworks either stabilised or became unstable through emerging controversies. This analysis highlights how these subnetworks positioned themselves within the broader PDM network through ongoing translations, and how actor roles evolved, shifted, or failed across the PDM process.

ANT captures the relational dimensions of healthcare processes by recognising that both human and non-human actors jointly produce practice. Processes are shaped through collaboration among heterogeneous actors who form networks and translate relationships within and across activities. Technical tools and process models, therefore, function alongside human actors as integral components of care delivery. Consistent with ANT principles, human and non-human actors mutually shape each other, and their roles cannot be separated. As society and nature are inseparable, so too are human and non-human actors within healthcare processes (Latour, 1983).

They form an interconnected seamlessly web, where actors continuously negotiate and adjust their roles and functions over time within the space of the process and interactions (Aka, 2019; K. M. Cresswell et al., 2010; Rantakari & Vaara, 2017). ANT provides a lens to understand these complex interactions and dynamics within healthcare systems, allowing analysis of relationships between human and non-human actors, such as patients, healthcare providers, technologies, policies, and institutions. Applying ANT in healthcare enables researchers and practitioners to gain insights into system complexities, including knowledge translation, technology adoption, organisational change, and patient–provider interactions, offering a richer understanding of the social and material factors that shape healthcare processes and outcomes.

In this study, ANT was applied to interpret data from observations and semi-structured interviews by merging key themes. The analysis focused on how actors form networks and how patient medication information is translated and transformed into actual patient medications within these networks. This approach highlights the translation moments that create challenges and identifies opportunities for improvement.

Figure 2 illustrates the actors and networks present in community pharmacies and RACFs during the study. It shows how actors were connected within networks to deliver services, using patient medication information to provide medications and related care. Throughout these activities and events, human actors negotiated directly or indirectly, consciously or unconsciously, in moments identified by ANT as translation moments.

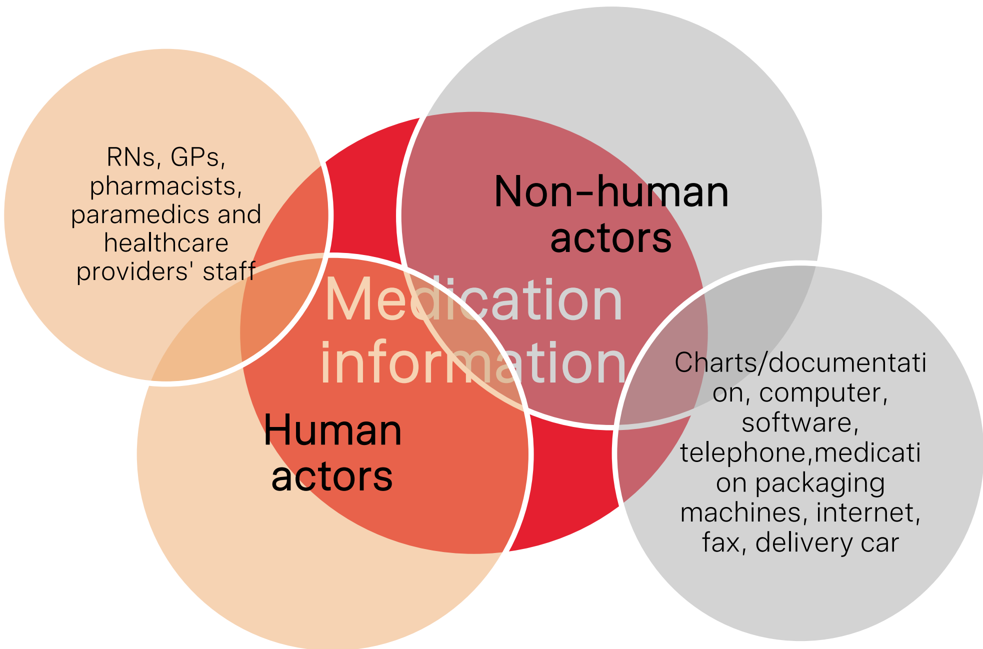


Figure 2: Actors' relationships and interactions in the PDM process

In this study, a complementary approach using both EM and ANT is employed to provide a comprehensive understanding of how visible and invisible tasks, as well as human and non-human actors and their relationships, combine to create and stabilise healthcare processes. EM simplifies complex information through visualisation, making it more accessible and easier to comprehend, while ANT highlights the relational and dynamic aspects of interactions within the network. Together, this approach supports the PDM process by providing detailed insights that help untangle its complexity. These processes can be viewed as networks composed of interconnected actions and interactions.

2.2.4 Data interpretation utilising EM and ANT

In this section, the EM modelling tool is used to interpret data from semi-structured interviews with RACF RNs and observations in community pharmacies. The Essomenic model maps the patient medication information journey, showing activities, roles, and interactions involved in the PDM process across RACFs and community pharmacies. Using Microsoft Visio 2021, the model visually represents medication information flow, staff activities, processes, documents, patient needs, and resources over time. Figure 3 and Table 5 detail the Essomenic model's architecture and layered structure.

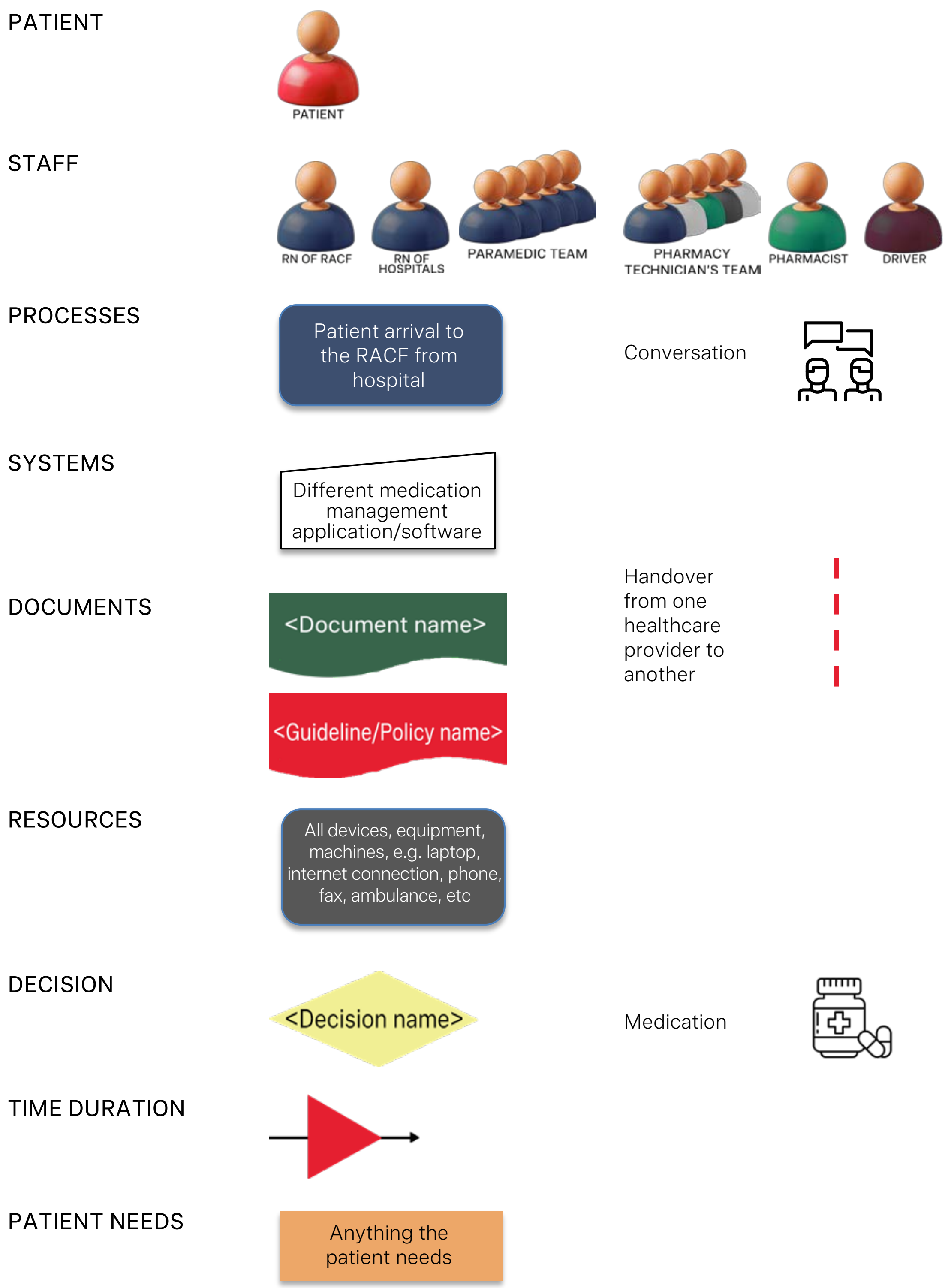


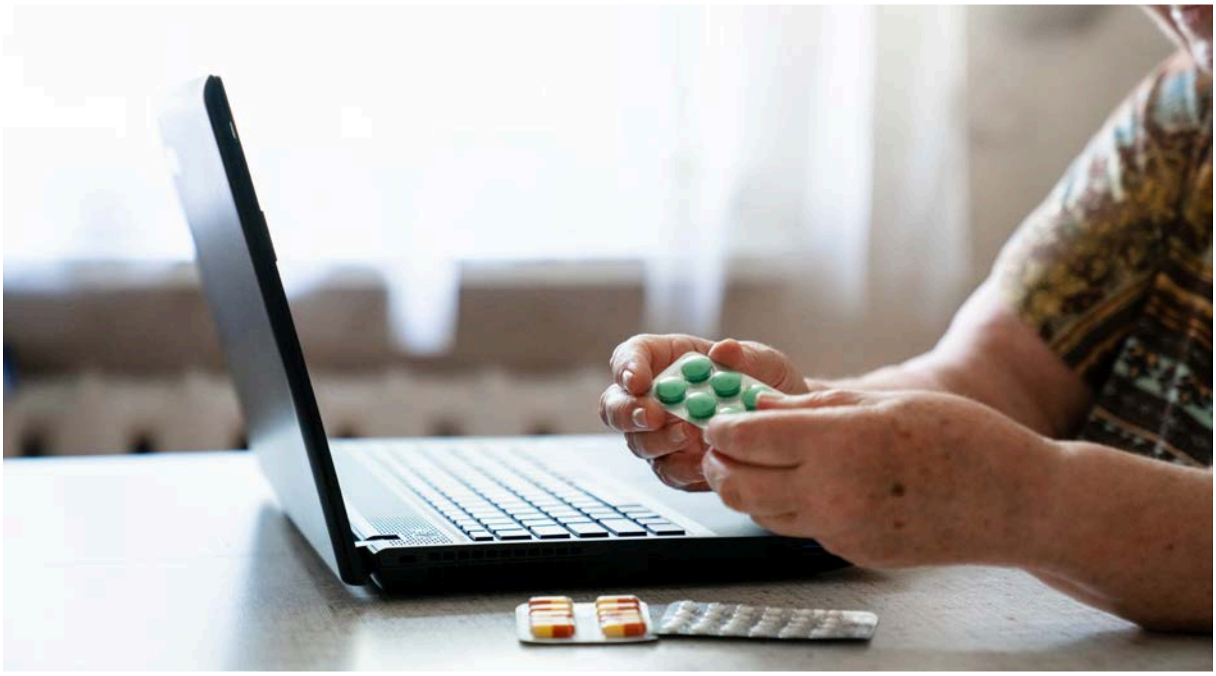
Figure 3: Essomenic architecture for the PDM process

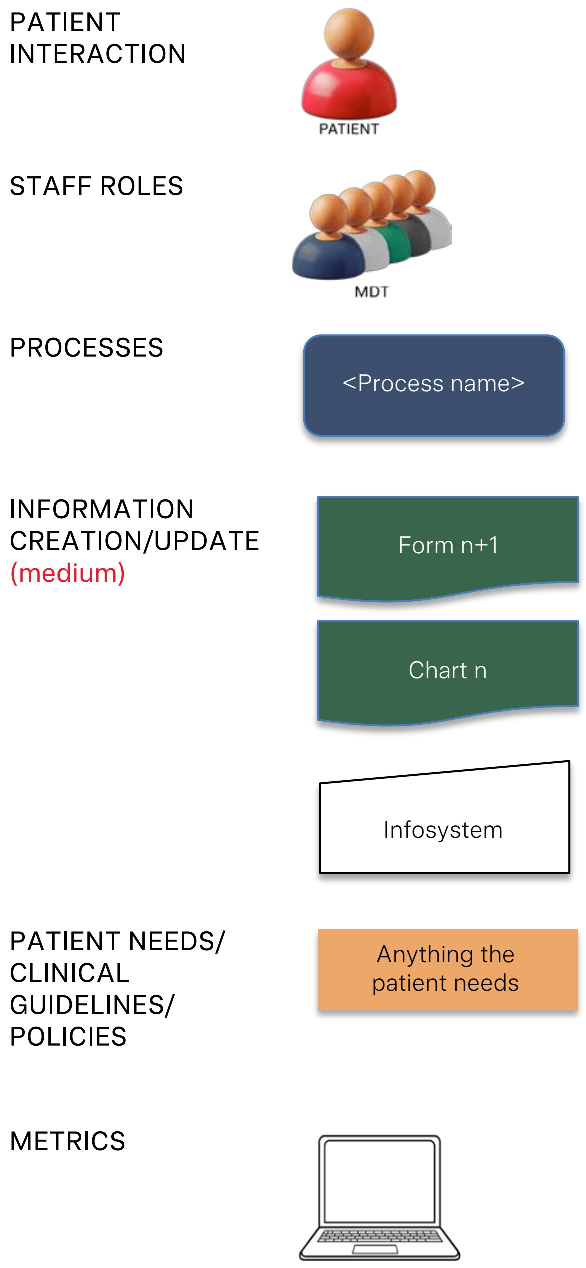
Layer name	Content description
Patient movement	As the patient isn't involved directly in this study, the patient movement at this phase of the model presents when, where and how many times patients are transferred or receive or need medication. Also, the patient medication information such as prescription, medication summary chart or medication discharge chart/summary stands in as a proxy for the patient
Staff roles	Presents what role registered nurse (RN) of the hospital, RN of RACF, GP of RACF and after-hours GP, pharmacists, pharmacy technicians, and other staff played in the patient medication journey
Processes	Names and relates the practical handling processes involved in the journey
Communication/ information creation/ information updates	Presents information flow and communication as paperwork and systems are created, or updated by the pharmacists in the community pharmacy or registered nurses of RACFs
Policies/ Legislation	Number of legislation or policies that must be adhered to during the enactment of the processes
Equipment/resources	The various devices used in the process.

Table 5: Essomenic descriptor for the PDM process

The EM tool is used to interpret and visualise partial data analysis from the interviews of twelve registered nurses' responses to the PDM process questions in practice, along with observations from two community pharmacies, illustrating current practices in Queensland, Australia.

The ANT implies EM, which allows us to visualise social interactions and the construction of realities. It also shows how human and non-human actors shape the movement, negotiation, action, and interaction of the patient's medication information throughout this, which facilitates an understanding of how the PDM process is structured in healthcare practice (A. Fitzgerald & Curry, 2011). The EM approach mainly focuses on patient movement (Figure 4) in transitional care between and within the organisation, which provides a comprehensive and easily understood description of the process. Whereas the ANT approach focuses on both human and non-human actors. There is no difference between actors involved in a process because both actors participate in the process's structure and development (Aka, 2019; Latour, 1983). Thus, the conjunction of ANT and EM provides a new insight, which also focuses on both patient movement as well as patient medication information movement (transfer of information), patient medication information translation and transformation within the process (Figure 5). The process in this study could be considered the place where human and non-human actors and actants meet to shape a network of actions and interactions.

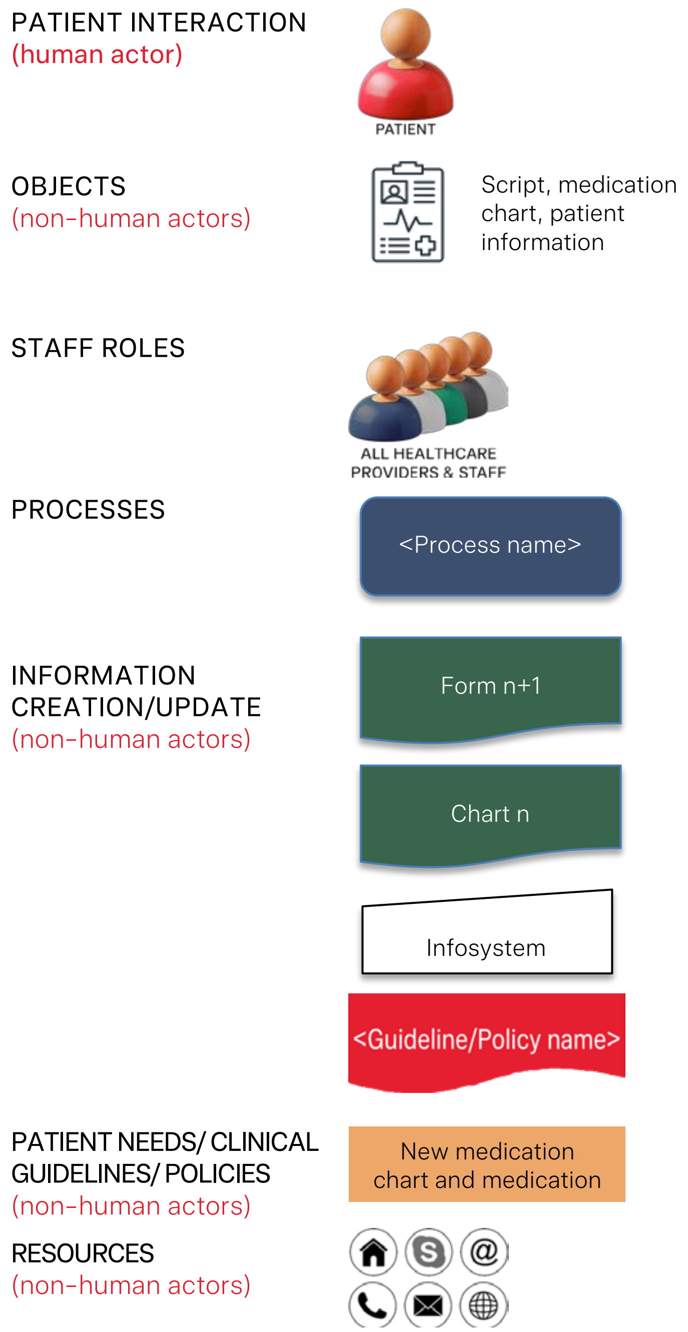




Description:

- The patient interacts with staff.
- This is followed by processes and information updates.
- This fulfils the patient's needs by using various metrics.

Figure 4: Essomenic- visualising tool in transitional care



Description:

- The patient interacts with the staff. This is followed by interaction with non-human actors, including software and medication information.
- This is followed by the process and the information updates.

Figure 5: Implication of ANT (non-human actors) to EM

Processes are central to quality improvement and play a critical role in delivering high-quality healthcare (Colligan, Anderson, Potts, & Berman, 2010; Trebble, Hansi, Hydes, Smith, & Baker, 2010). While a simple definition describes a process as "a set of activities that deliver value to the customers" (Ruiz et al., 2012, p. 77), this does not capture who is involved, how activities are carried out, or what is delivered. In this study, processes are approached as a lens to unpack the complex events, states, and interactions that shape healthcare activities. A process perspective highlights the overall structure and flow of organisational activities, examining sequences of steps, tasks, and decisions to achieve specific outcomes (Tsoukas, 2017). This relational view emphasises that all activities and entities are interconnected, creating complex situations and relationships that must be considered in understanding and improving healthcare processes.

From an ANT perspective, both human and non-human actants must be followed and analysed to understand the steps and activities that construct a process and what occurs throughout it (Eassey, Smith, Krass, McLAchlan, & Brien, 2016; Latour, 1999). While ANT studies often use detailed narrative descriptions to trace connections among entities (Ponti, 2012; Stone, 1979) they rarely explain why these connections occur (K. Cresswell et al., 2011). Narrative approaches, or "thick descriptions" (Czarniawska, 2000; Geertz, 2008; Porsander, 2005; Riessman & Quinney, 2005), are commonly used, yet visualisation methods are underutilised (Turner et al., 2018). The EM provides an opportunity to visualise previously hidden steps, making them explicit and integrating them into the actual workflow (A. Fitzgerald & Curry, 2011; J. A. Fitzgerald, Curry, Olde Meierink, & Cully, 2019).

Beyond this, EM is specially designated and widely used in quality improvement of healthcare research studies and only looks at interrelated human patterns. (Anneke Fitzgerald & Dadich, 2009; Curry et al., 2014). EM helps to understand organisations' processes by drawing the human actants' connections and interrelationships. This provides an understanding of only the human actant of the process. The addition of ANT lenses to understand complex processes is relevant because it goes beyond what human actions can do, and what technology can do by itself. ANT takes a holistic perspective in which all key actors (both human and non-human), across different organisations, are considered.

2.2.5 PDM process in practice through EM modelling

Figures 6 to 11 present the PDM process using the EM modelling tool, complemented by the ANT lens, to map healthcare processes and highlight potential areas for improvement. While the merged themes from coding were summarised into four main steps, the Essomenic map depicts a greater number of detailed steps and activities. To ensure clarity and accurately represent the process, the PDM workflow is illustrated across six continuous figures.

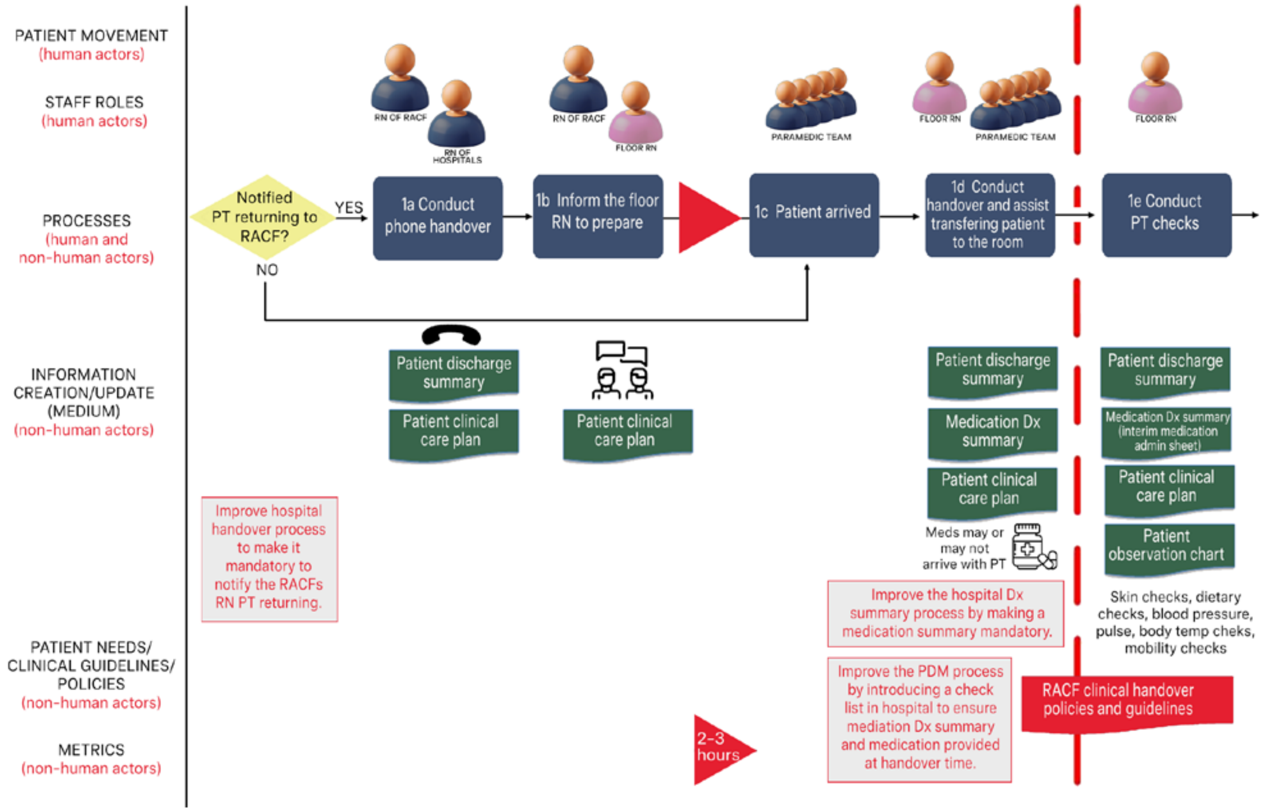


Figure 5: Patient's arrival at the RACF

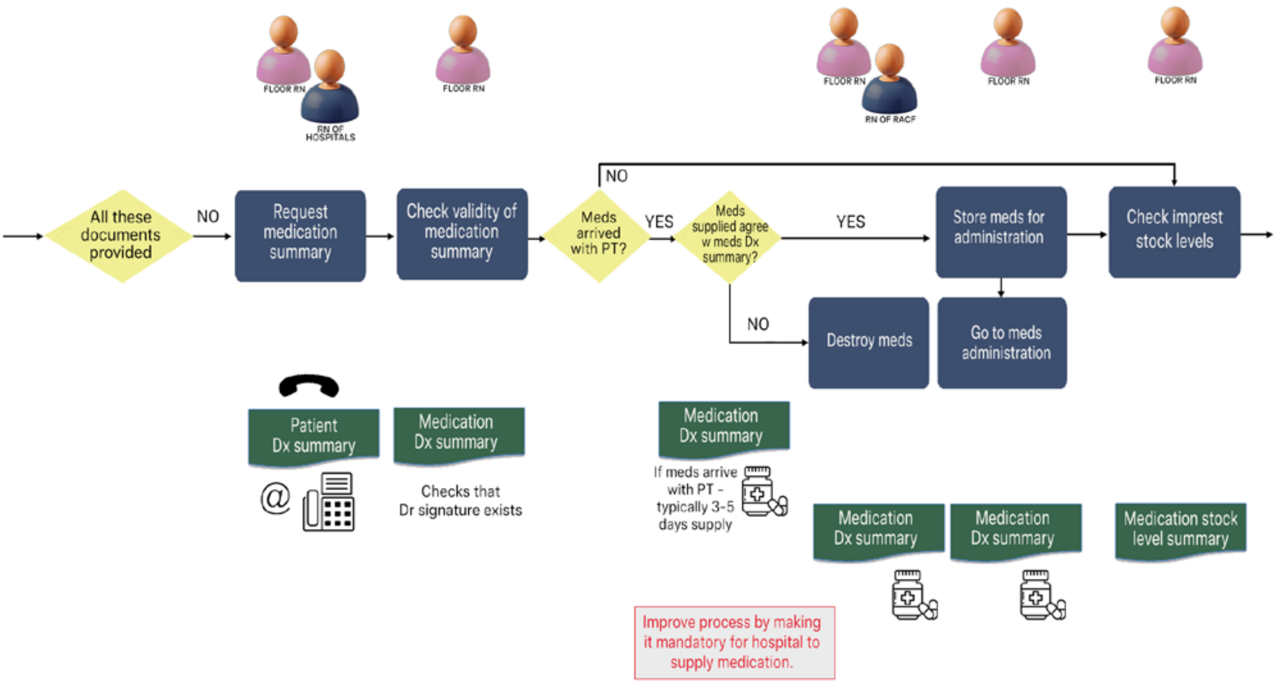


Figure 6: Amendment checks by RNs

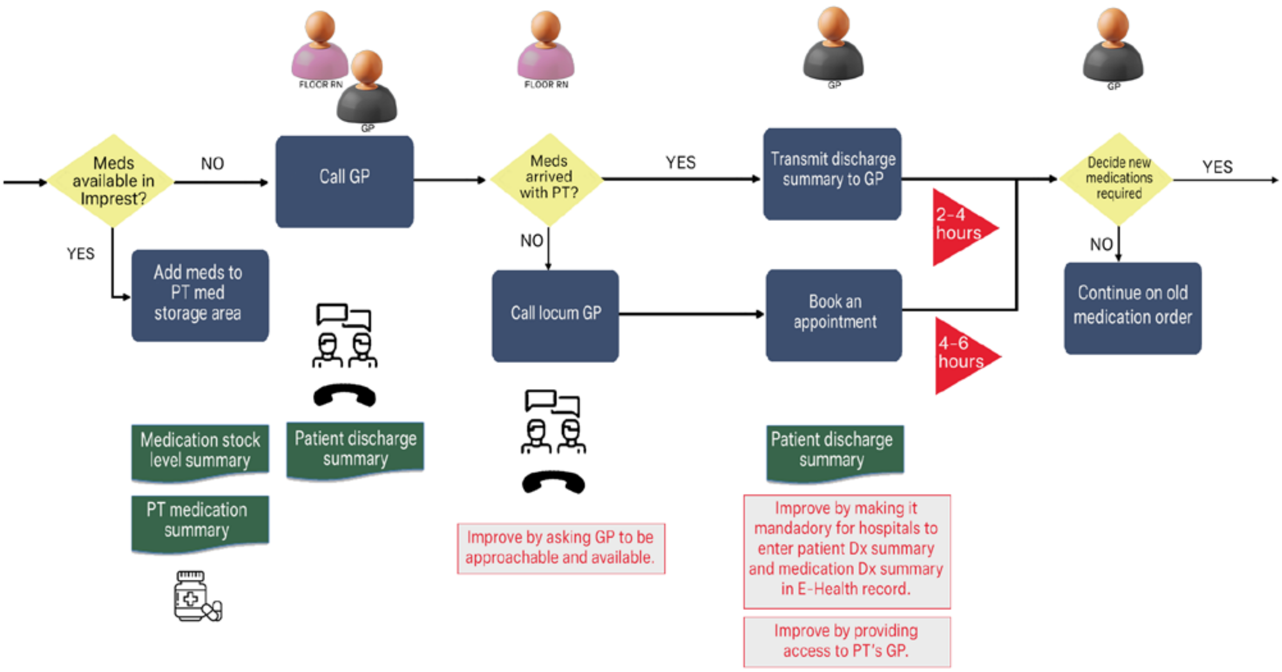


Figure 7: GP's notifying

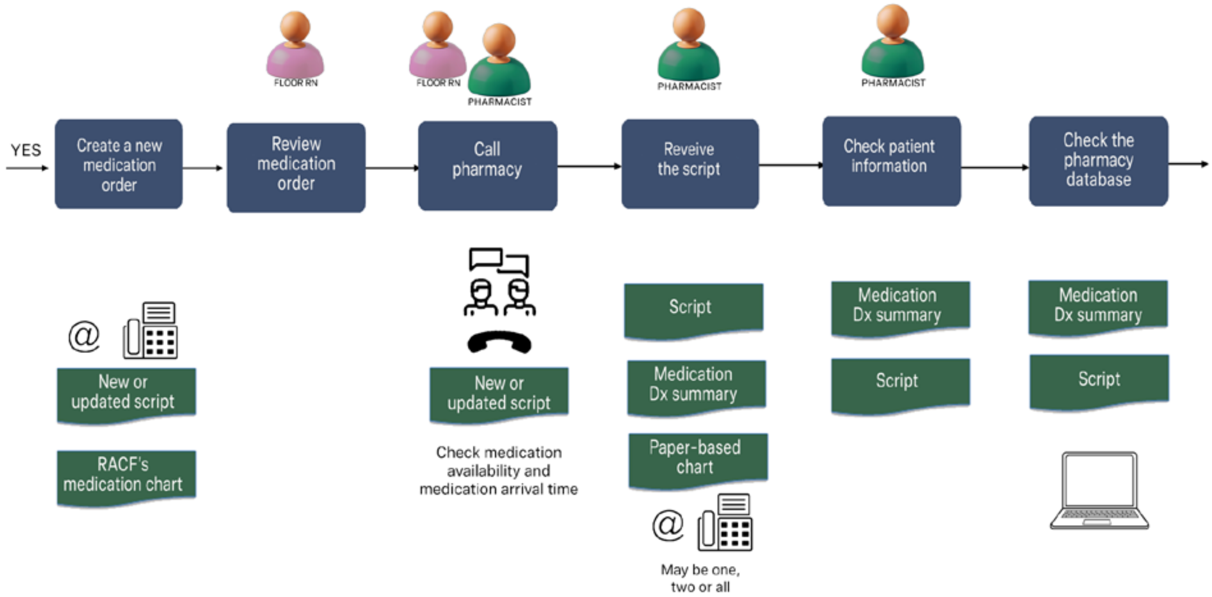


Figure 8: Community pharmacy engagement and patient medication information arrival

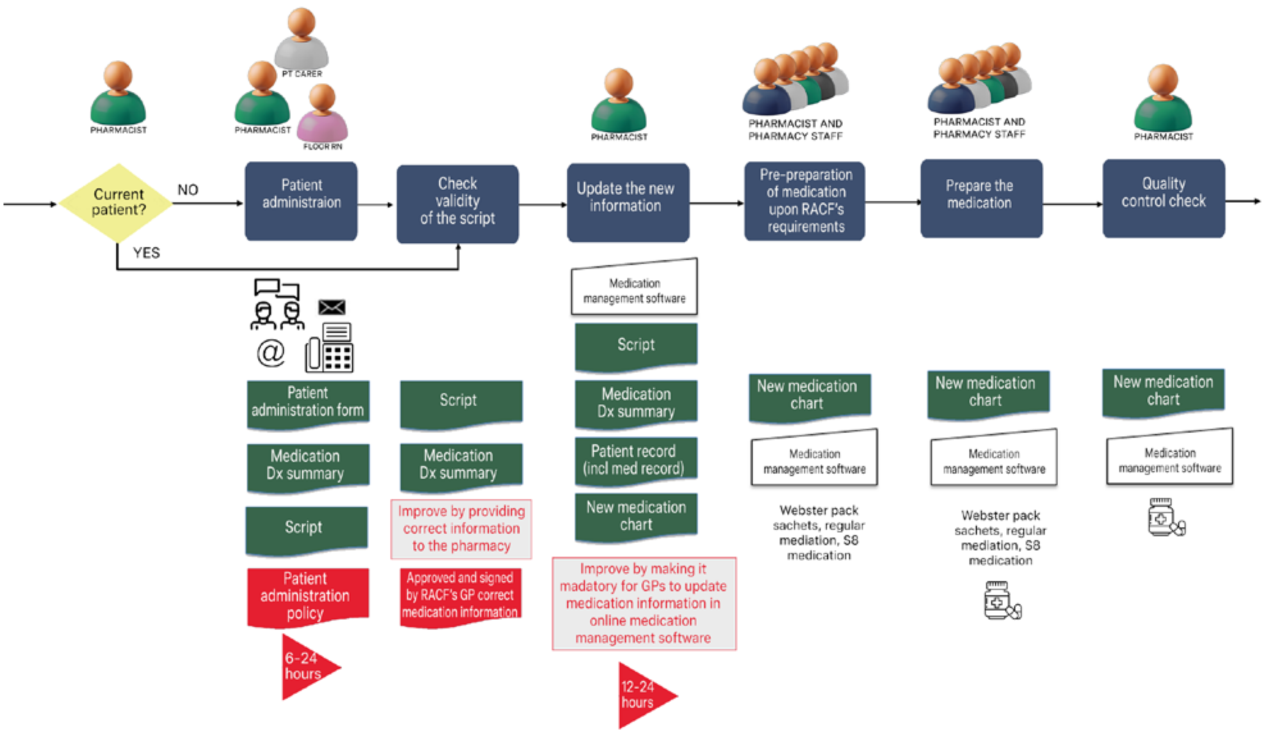


Figure 9: Patient's medication/s preparation in the community pharmacy

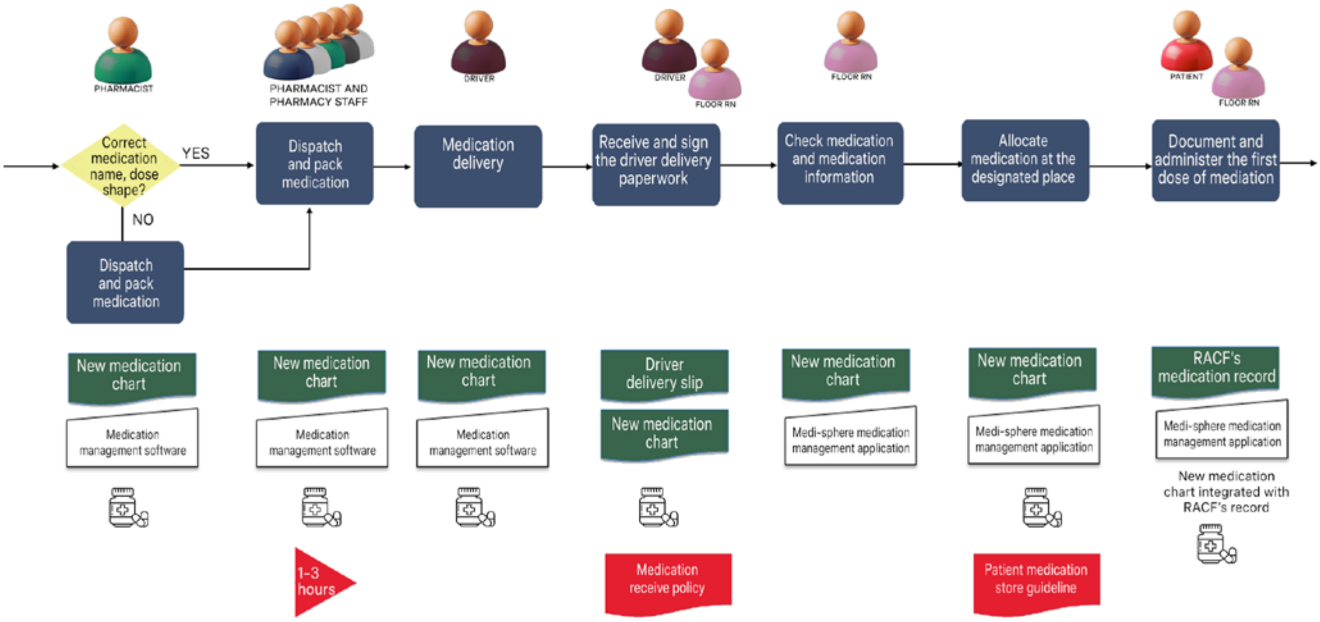


Figure 10: Patient's medication arrival at RACF and medication administration

2.3 Data interpretation discussion

The PDM process in healthcare is highly complex, involving multiple human and non-human actants interacting across organisations, with overlapping, aligned, or non-aligned actions (Braithwaite et al., 2017; Greenhalgh & Papoutsi, 2018; Langley & Tsoukas, 2016). Essomenic (EM) modelling facilitates unpacking ambiguities between process elements at organisational interfaces by visualising steps, while Actor-Network Theory (ANT) enables analysis of human and non-human actants, their roles, and interactions (Eassey et al., 2016). For example, hospital and RACF registered nurses act as intermediaries to transfer patient medication information, and failures in this communication create instability or 'betrayals' in the network.

Recent evidence continues to demonstrate the critical importance of medication reconciliation at care transitions. Pharmacist-led medication reconciliation, according to Field Hammad et al. (2025), significantly decreased medication errors and enhanced 30-day post-discharge results in elderly Jordanian patients, underscoring the importance of structured reconciliation for vulnerable Similarly, Garratt, Dowling, and Manias (2025) undertook a mixed-methods systematic review of 128 studies across aged care facilities that identified that educational interventions for aged care workers significantly reduced medication administration errors (OR = 0.37, 95% CI 0.28-0.50). p < .001), highlighting the importance of staff training alongside technological solutions. However, these studies also emphasise a persistent challenge: medication administration in aged care facilities remains predominantly task-oriented rather than resident-centred, with staffing constraints and time pressures driving 'production-line' approaches to care delivery (Berkovic et al., 2024; Garratt et al., 2025). This finding aligns closely with the current study's identification of staffing and training resources as essential requirements alongside technological solutions.

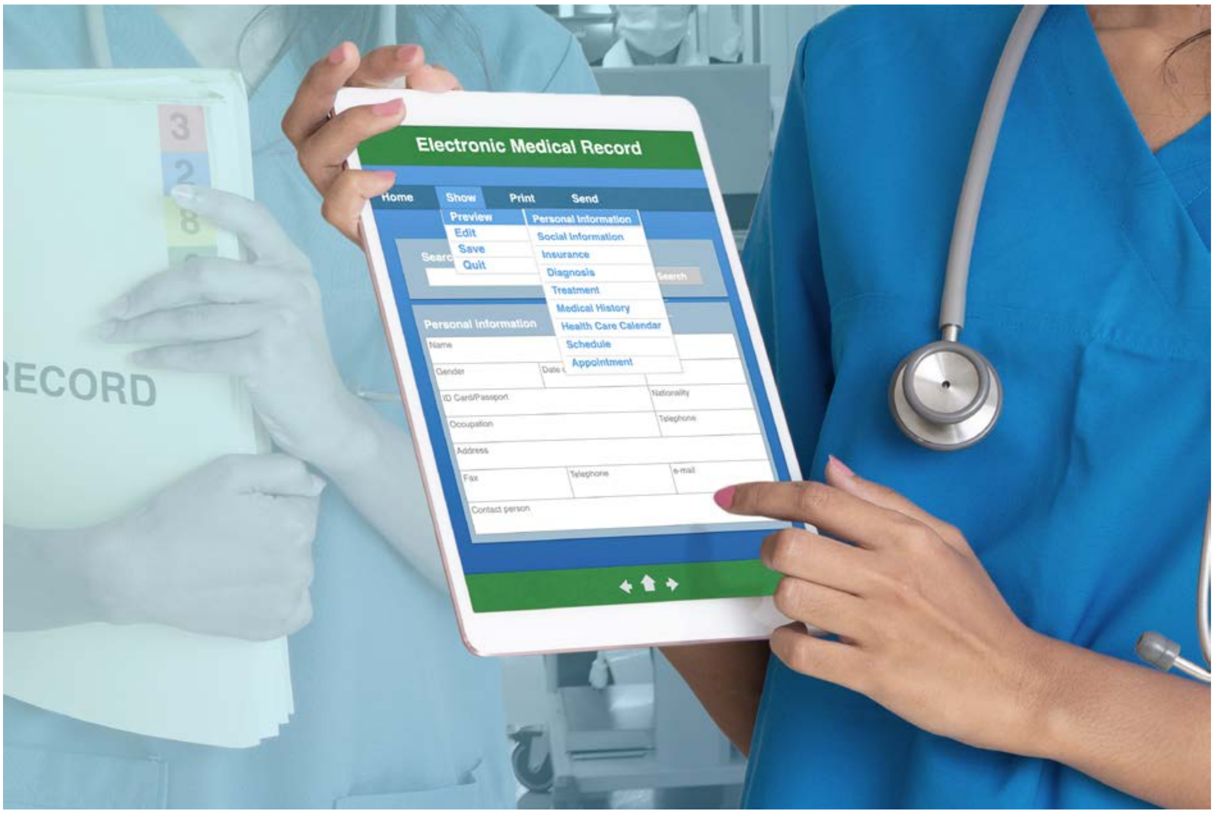
Time, location, and medication information are key non-human actants influencing patient safety, clinical care, and workflow. Timely notifications and accurate real-time documentation of patient medication information are critical to preventing delays, errors, and disruptions in the PDM process (Bjerre et al., 2018; Kim et al., 2018). The process crosses multiple organisations—hospitals, RACFs, and community pharmacies—adding spatial and temporal complexity. Each actant's role may shift, and interactions can be invisible, requiring negotiation and continuous network stabilisation.

This ANT conceptualisation finds empirical support in recent medication administration research. Garratt et al. (2025) systematic review identified five critical themes in aged care medication administration, four of which align with non-human actor roles: staffing concerns (time as actant), uncertain role of residents (human actor negotiation), medication-related decision-making (knowledge as actant), and use of electronic medication administration records (technology as actant). The review's finding that medication administration operates as task-oriented 'production-line' care driven by temporal and staffing constraints provides empirical validation of this study's ANT analysis, showing time functioning as an *immutable obligatory passage point*—all actors must navigate temporal constraints regardless of technology deployment.

Communication is a major source of complexity (Sassoli & Day, 2017). Information exchange occurs via face-to-face, telephone, written, or digital channels, forming a 'communication space' that relies on multiple human and non-human elements and can influence patient outcomes (Coiera, 2000, 2006; Kattel et al., 2020). Delays or missing information, such as incomplete discharge summaries, create sub-problems that require multiple interactions to resolve, prolonging the PDM process and increasing the risk of errors (Becker et al., 2021). Recent polypharmacy research by Jandu, Mohanaselvan, Dahal, and Bista (2024) identifies system-related factors as key contributors to these communication failures: automatic medication refills without review, inadequate medication reconciliation processes, poor care transitions, and time constraints limiting physician-patient counselling. These findings align with the current study's CSIRO ON Prime validation results. Sixty-five stakeholders identified that the fundamental problem is not the absence of technology but a deficit in implementation support. Providers struggle with system selection, configuration, integration, and training. High staff turnover and substantial administrative burdens further complicate ongoing maintenance.

Electronic health records (EHRs) and electronic medication administration records (eMAR) have been introduced to improve communication and real-time information sharing, offering access to patient records, medication history, and clinical information across healthcare providers (Hanna, Gill, Newstead, Hawkins, & Osborne, 2017; Mendelson & Wolf, 2016). Recent implementation studies show both promise and persistent challenges. A 2025 pre-post intervention study in 41 Hong Kong residential care homes showed that an electronic medication management system significantly improved staff time efficiency and competencies, with cost per medication dose dropping from HKD 2.00 (US$0.25) to HKD 0.74 (US$0.09)- a 63 per cent reduction- while staff reported significant improvements in accessing records and administering medications (Au-Doung et al., 2025). This demonstrates that well-implemented electronic systems can deliver substantial operational and cost benefits.

However, Australian research continues to highlight the fundamental role of quality implementation, pointing to integration problems that limit these benefits. Electronic medication administration records in RACFs typically remain disconnected from GP clinical software, requiring manual transcription of medication orders via fax or email to pharmacies (Tariq, Georgiou, & Westbrook, 2013). Common practice involves GPs handwriting medication orders on paper charts, which are copied and faxed or emailed to the RACF's pharmacy, where orders are transcribed into electronic systems to populate the electronic medication administration record. When doses are altered or drugs are stopped, the same fragmented process repeats, introducing multiple opportunities for transcription errors and delays. This fragmentation persists despite technological advances, reinforcing the ANT finding that software incompatibility operates as a structural barrier preventing network stabilisation – regardless of individual system quality.



The persistence of manual transcription despite electronic system availability exemplifies what ANT terms 'betrayal' in the network – where supposedly compatible actants (electronic systems) cannot translate effectively because of integration failures at organisational interfaces. While EHRs enhance accessibility and support safer care, challenges remain regarding integration, usability, security, privacy, and clinician adoption (Almulhem, 2012; Kataria & Ravindran, 2020; Taylor, 2022). The critical issue is not the absence of electronic systems, but the lack of fully integrated electronic medication management systems enabling GPs to start, change, and cease medications electronically with automatic transmission to electronic medication administration records, pharmacies, and GP clinical records—eliminating transcription steps that introduce errors and delays.

2.3.1 Current evidence on medication reconciliation and error reduction

Recent systematic reviews reveal that while electronic medication reconciliation tends to reduce adverse drug events and medication discrepancies, conclusions remain limited by inconsistent study settings, interventions, and outcome definitions (Killin, Hezam, Anderson, & Welk, 2021). A comprehensive 2021 systematic review of advanced medication reconciliation found that electronic approaches generally reduced the odds of medication discrepancies or adverse drug events compared to paper-based systems, though enhanced medication reconciliation (incorporating additional interventions beyond electronic format) showed mixed results. More critically, the 72.6 per cent medication discrepancy rate documented in the Makeham et al. (2020). The Australian study that forms the foundation of the current research continues to align with international evidence. Studies involving pharmacist-led medication reconciliation consistently reveal a significant number of initial discrepancies in older adults, and while interventions help decrease these errors, they do not entirely eradicate them (Hammad et al.).

A systematic review and meta-analysis by Carollo et al. (2024) examining clinical impact of medication review and prescribing in older inpatients across 21 randomised controlled trials and 30 total studies confirmed that while interventions improve medication appropriateness, the complexity of medication management in geriatric populations causes comprehensive, multi-faceted approaches rather than single-point interventions. This finding strongly supports the current study's conclusion: standalone software solutions prove insufficient. The aged care sector requires comprehensive implementation support programs. These programs must address technical integration, organisational workflow redesign, and sustained capacity building co-ordinately. Educational interventions for aged care workers reduce medication administration errors by 63 per cent (OR = 0.37) (Garratt et al., 2025). This evidence underscores that technology deployment must be accompanied by systematic staff development programs.

Within the PDM process, human actants—physicians, nurses, pharmacists—interact with non-human actants, including prescriptions, medication charts, knowledge, tools, and regulations. These heterogeneous actants negotiate and interact to form a stabilised network, which can be visualised via EM to provide a clearer understanding of their roles and interactions (Aka, 2019; Callon, 1984). For instance, hospitals may supply newly prescribed medications at discharge, reducing the need for urgent interventions by RACF registered nurses or community pharmacies, although practice remains inconsistent.

2.3.2 The need for resident-centred approaches

Another systematic review reveals a critical gap in medication administration research and practice: the predominant focus on clinical tasks and medication errors at the expense of interpersonal and psychosocial dimensions (Garratt et al., 2025). Irrespective of publication date, studies included in the 2025 systematic review primarily focused on medication administration as a clinical task and not necessarily on its interpersonal aspects. This aligns with the ANT findings and the discourse around task-oriented or 'production-line' care, driven by staffing and time constraints, rather than resident-centred care (Berkovic et al., 2024; Delaney, 2018). Resident-centred care emphasises partnerships between recipients and providers of care, prioritising residents' values, preferences, and autonomy.

Despite the growing emphasis on person-centred care principles, empirical evidence on resident-centred medication administration approaches remains scarce. This task-oriented focus reflects the broader challenge identified in the current study: medication management systems prioritise workflow efficiency and error reduction over collaborative, person-centred care models. Future PDM process improvements must balance medication safety imperatives with residents' autonomy, preferences, and quality of life considerations-a dimension absent from current technological solutions and process improvement initiatives. The finding that aged care workers' primary goal is to 'get the work done' (Garratt et al., 2025), while understandable given duty-of-care obligations and time pressures, highlights the need for systems that support both safety *and* resident engagement, rather than treating these as competing priorities.

2.3.3 Understanding healthcare processes in complex organisational contexts

Healthcare organisations are inherently complex and dynamic due to constantly changing processes, the variety of tasks, and the critical nature of human life, which often requires urgent attention (Cohn, Clinch, Bunn, & Stronge, 2013; Nembhard, Alexander, Hoff, & Ramanujam, 2009). Healthcare systems are complex adaptive systems composed of multiple smaller subsystems, each with institutional, organisational, work environment, administrative, and patient-related dimensions, which cause continuous problem-solving and adaptability (Kuziemsky, 2016; Lenz, Peleg, & Reichert, 2012; Nason, 2023). Achieving quality care relies on the unpredictable actions of individuals across transitional care settings, including patients, providers, and caregivers (McKEON, Oswaks, & Cunningham, 2006; Troshani & Wickramasinghe, 2014).

Quality healthcare is critical for patient safety and is defined as accessible, appropriate, effective, safe, and patient-centred (Akhu-Zaheya, Al-Maaitah, & Bany Hani, 2018; Park, 2021). While industrial quality improvement methodologies such as Lean, Six Sigma, and PDSA cycles have been applied in healthcare, evidence of their long-term effectiveness and implementation success is limited because of the unique complexity of healthcare processes and the dynamic needs of patients (D'Andreamatteo, Ianni, Lega, & Sargiacomo, 2015; Peimbert-García, 2019). Unlike industrial systems, healthcare processes focus on individual patient outcomes and human lives, requiring adaptive and relational approaches to process improvement (Ahmed, Ahmad, & Othman, 2019; Bate, Mendel, & Robert, 2007; Varkey, Reller, & Resar, 2007).

Processes in healthcare are dynamic, shaped by frequent changes, adaptations, and interactions, and improvements aim to enhance patient outcomes, system performance, and staff development (Batalden & Davidoff, 2007; Goetsch & Davis, 2006; Turner et al., 2018). Business process management concepts provide insights into mapping, defining, and improving processes, which can simplify the complexity of healthcare operations and support continuous improvement (Benner & Tushman, 2003; Ruiz et al., 2012).

Healthcare processes involve clinical (medical) processes, which are patient- and diagnosis-specific, and organisational (administrative) processes, which support clinical activities. These processes form interdependent networks of activities, where human connections, interactions, and communications are intertwined with material elements such as spaces, objects, and tools (Colligan et al., 2010). Interdisciplinary coordination is essential, as healthcare organisations operate as network-like systems with cross-organisational professionals requiring efficient knowledge sharing and social interactions (Cunningham et al., 2012; Mueller & Neads, 2005).

Despite progress in understanding healthcare networks, gaps remain regarding how network activities are enacted in practice, particularly due to the ambiguous and evolving inputs and outputs in healthcare organisations (Cole, Waite, & Nichols, 2004; Hearld, Alexander, Fraser, & Jiang, 2008). Therefore, standardising processes like the PDM process is challenging. This study uses an ANT lens to understand the PDM process in practice, identify challenges, and visualise improvement opportunities, with recommendations presented via EM maps for clarity and practical application. The convergence of evidence from the doctoral research, CSIRO ON Prime validation, and recent international literature (2024-2025) demonstrates that effective PDM process improvement requires: (1) leveraging existing EHR infrastructure with full integration across organizational boundaries, (2) comprehensive implementation support programs addressing technical, organizational, and human factors, (3) systematic staff education and capacity building, and (4) balanced attention to both medication safety and resident-centred care principles.

2.4 Recommendations for PDM process improvements

The suggestions to improve the PDM process are visualised in Figures 12 and 13. The main process improvement suggestion aims to leverage currently available resources within the Australian healthcare system. The EHR platform is already established as a tool; therefore, the primary suggestion is to utilise the EHR's full potential to enhance the PDM process. This approach aligns with international evidence demonstrating that well-implemented electronic medication management systems can achieve substantial cost reductions (63 per cent in the Hong Kong study; (Au-Doung et al., 2025)) and operational improvements, while addressing the persistent Australian challenge of fragmented, non-integrated systems.

For this study, it is recommended that policymakers consider national consistency measures and encourage sector-wide adoption of standardised discharge protocols. This initiative aims to reduce overall workload, ensure more consistency and accuracy in patient medical information in real-time, and simplify the process. Additionally, it is more cost-effective, as the EHR platform already exists and only requires justification and adaptation for the patient discharge process. Critically, implementation must be accompanied by comprehensive support programs addressing the barriers identified in both this research and recent international literature: adequate training time, ongoing technical support, change management frameworks, and sustained capacity building to address high staff turnover (Garratt et al., 2025; Jandu et al., 2024).

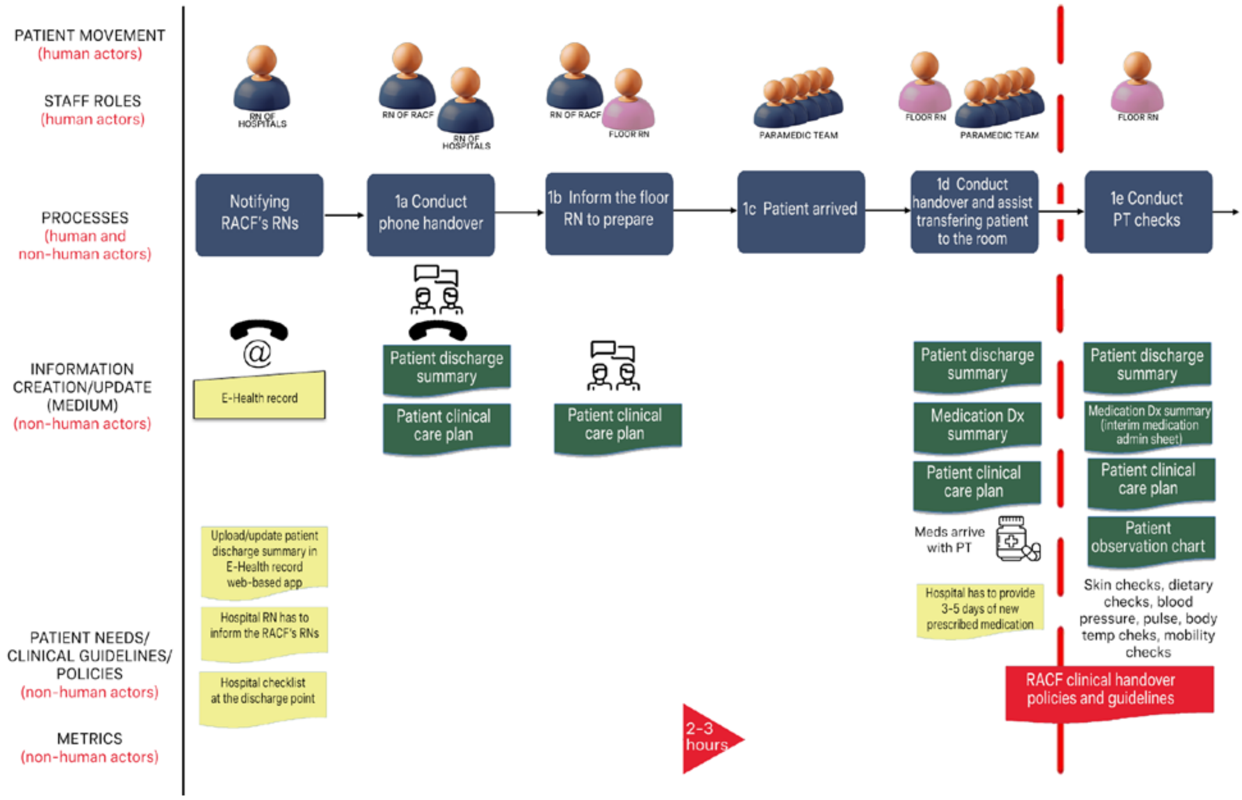


Figure 11: The improved PDM process

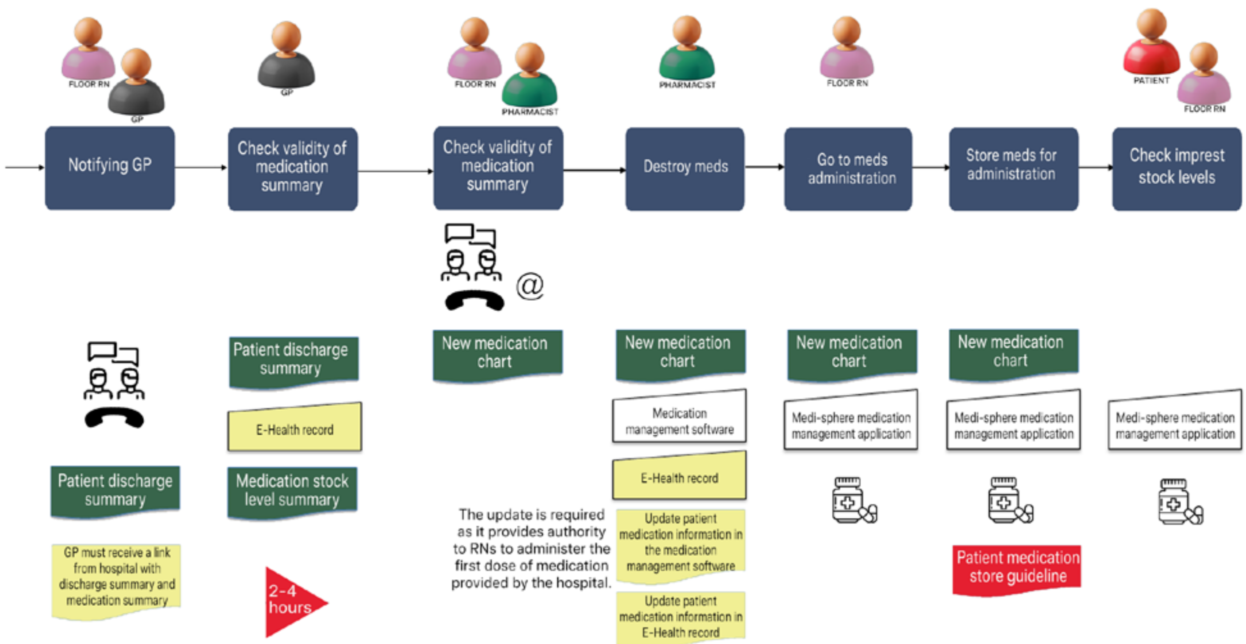


Figure 13: Continue – improved PDM process

2.4.1 Proposed PDM process improvements using EHR

Hospital RNs at discharge:

- Upload the patient's discharge medical information to the EHR.
- Send the secured EHR link to the patient's GP.
- Inform RACF RNs of the patient's discharge and expected arrival time.
- Provide required information to RACF RNs via telephone.
- Follow the discharge checklist, including supplying 3–5 days of newly prescribed medications.

Paramedics:

- Follow the discharge checklist to ensure receipt of the patient's discharge summary and medications for handover to RACF RNs.

RACF RNs:

- Conduct compliance checks.
- Follow the discharge checklist, including receiving the patient's discharge summary and medications.
- Adhere to medication storage guidelines.
- Notify the GP at patient arrival, allowing 2–4 hours for review of discharge information.
- Notify the community pharmacist.

RACF GP:

- Review the patient's discharge summary and medication via the secured EHR link.
- Review the patient's clinical care, including discharge and medication information.
- Confirm and upload or update revised information in the EHR.
- Notify RACF RNs once updates are completed.

Pharmacist:

- Update or upload revised medication information in:
    - Community pharmacy database
    - Medication management software (e.g., Medi-sphere)
    - EHR

RACF RNs (after updates):

- Administer the patient's medication.
- Record and document the patient's medication administration information.

How These Suggestions Improve the Current PDM Process

1. Real-time information availability: EHR enables immediate access to patient data, reducing delays from fragmented information and follow-up communications.
2. Increased efficiency: Streamlined communication reduces time for clarifications and confirmations, supporting smoother workflow and lowering staff workload.
3. Long-term workload reduction: Although initial use may require effort, real-time updates improve accuracy and accessibility, reducing repetitive tasks over time.
4. Enhanced patient safety: Timely and accurate access to medical information lowers the risk of medication errors and hospital readmissions.
5. Improved quality of care: Centralized access ensures all healthcare professionals can deliver timely and safe medication services.

2.4.2 Recommendations from healthcare professionals

Registered Nurses:

- Accessible online platform for all healthcare professionals to view patient clinical information.
- Proper handover framework with electronic discharge summary: timely notification, comprehensive information transfer, and designated 24/7 points of contact.

Pharmacists:

- Unified online platform for patient health information accessible by all healthcare providers.
- Standardised electronic discharge medication chart complying with national residential medication chart legislation.
- Staff knowledge and skills development through comprehensive training programs.

Core Recommendation:

- Leverage Australia's existing EHR platform to its full potential. The platform is already established but requires justification and adaptation for the patient discharge process. Implementing this would create a unified system for all healthcare professionals, reduce translation moments from six to three, provide real-time access, and support network stabilisation through compulsory policy enforcement.

3. CSIRO ON Prime validation and stakeholder engagement

3.1 ON Prime program overview

Following doctoral research completion, the MED_AI_SAFE project was accepted into CSIRO ON Prime 16 (Brisbane cohort). ON Prime is a national pre-accelerator supporting research teams to validate real-world needs, understand customer problems, and explore translational pathways. The program provided:

- Structured validation methodology and frameworks
- Dedicated mentoring from industry experts
- Funding support up to $5,000 for stakeholder engagement
- Networking opportunities with healthcare innovators

3.2 Validation methodology and sample

The validation study employed structured interviews with 65 target stakeholders across the healthcare ecosystem. Rather than assuming commercial viability of a technology solution, the research tested whether doctoral findings reflected current operational realities and whether stakeholders perceived value in coordinated interventions.

Stakeholder Group	Number Interviewed
RACF Managers	20
Registered Nurses (Aged Care)	30
Community Pharmacists	10
Hospital Pharmacists	5
Total	65

Table 6: Distribution of 65 Stakeholders Interviewed in ON Prime Validation

3.3 Critical validation findings

The validation was unequivocal: stakeholders confirmed that problems documented in the original research had intensified rather than improved. Three essential requirements emerged consistently:

1. Interconnected software systems for seamless communication

   Stakeholders emphasised the need for integrated ecosystems enabling real-time data exchange, not standalone applications. Current systems operate in silos:

   - Hospitals use electronic medical record (EMR) systems
   - RACFs use different medication management applications (or paper-based systems)
   - Community pharmacies operate separate dispensing software
   - No automated data exchange exists between these systems

   This fragmentation causes manual transcription at every interface, creating multiple error opportunities.

2. Adequate staffing and training for proper implementation

   Stakeholders emphasised that technology alone is insufficient without organisational capacity to use it effectively. Current challenges include:

   - Staff unfamiliarity with digital health systems
   - Insufficient time for training during implementation
   - High staff turnover requiring continuous retraining
   - Lack of technical support when systems fail or malfunction
   - High workload of registered nurses with clinical care and administrative tasks

3. Standardised protocols working across different facility types

Stakeholders called for harmonised approaches enabling consistent practice, not customised solutions for each organisation. Current variability includes:

- Different medication chart formats across RACFs
- Inconsistent discharge summary documentation from hospitals
- Variable communication protocols between organisations
- No standard timeframes for information transfer

3.4 Critical insight: Implementation support over products

A transformative insight emerged from stakeholder engagement: the problem is not primarily a lack of technology but a lack of implementation support. Multiple software systems exist that theoretically could enable better medication management. However, aged care providers struggle to:

- Select appropriate systems from multiple vendors
- Configure systems correctly for their specific workflows
- Integrate new systems with existing processes
- Train staff effectively on new systems
- Maintain systems over time as staff turnover occurs

What the sector needs is comprehensive implementation programs addressing technical integration, systems design, and procedural training in a coordinated fashion.

4. Future research

Doctoral research (58 studies, 12 RNs, 5 pharmacists) and CSIRO ON Prime validation (65 stakeholders) demonstrate convergent evidence that medication management failures are persistent, systemic, universal, and consequential. Problems intensify despite technological advances, originating from organisational fragmentation and incompatible software systems rather than individual errors. These failures cause 72.6 per cent medication discrepancies, 27,569 avoidable hospital admissions annually, and $312 million in costs.

Integration of Essomenic modelling with Actor-Network Theory revealed that time and medication information operate as powerful non-human actors within the PDM network. Six translation moments (Hospital→Paramedics→RACF→GP→Pharmacy→RACF) each represent potential destabilisation points. Critical stakeholder insight: The problem is not technology absence but implementation support infrastructure deficits—providers struggle with system selection, configuration, integration, training, and maintenance.

4.1 Research program evolution

Phase 1 — Doctoral research (2019-2023): Documented systemic failures through literature review and fieldwork.

Phase 2 — CSIRO ON Prime Validation (2024-2025): Confirmed problems intensifying; identified need for comprehensive implementation support programs rather than standalone software.

Phase 3 — Healthcare ecosystem mapping (Current 2025-2026): Systematic assessment examining:

- Sector challenges and legislative responses: Government policies, Department of Health regulations, Australian Digital Health Agency standards, Aged Care Quality and Safety Commission requirements
- Technical solutions: EHR/My Health Record capabilities, FHIR standards, interoperability projects, medication management systems, EMR integration, pharmacy platforms
- Implementation barriers: Organisational readiness, staff digital literacy, financial constraints, technical infrastructure, vendor lock-in risks, data governance

CSIRO ON Prime funding supports surveys with RACF managers documenting software systems deployed, integration capabilities with external systems, medication reconciliation processes, digital maturity levels, adoption barriers, and implementation capacity. Current evidence indicates integration is predominantly absent except through manual data entry; Australian Digital Health Agency claims require empirical verification.

4.2 Planned future phases

Phase 4 — Gap analysis and solution design (2026-2027): Compare current solutions with documented needs, design holistic implementation support programs leveraging EHR infrastructure, and develop organisational change management and training frameworks.

Phase 5 — Pilot implementation (2027-2028): Test intervention programs in diverse RACF settings, evaluate implementation fidelity, stakeholder satisfaction, technical performance, medication discrepancy changes, process efficiency, and cost-effectiveness.

Implementation priorities: Leverage existing EHR infrastructure rather than develop new platforms; prioritise comprehensive implementation support over standalone technology products; address translation dynamics at each handoff point; adopt holistic system-level approaches requiring cross-organisational governance.

This research program advances and demonstrates rigorous triangulation methodologies, develops evidence-based implementation support programs, and provides policy recommendations.

Ultimate aim: Concurrent with Spark and FHIR program initiatives developing new interoperability infrastructure for Electronic Health Record alignment, this research program pursues a complementary strategy: leveraging existing healthcare system resources to deliver immediate, practical solutions for current RACF residents. This pragmatic approach enables the transformation of patient medical information travelling within time and space in Australian aged care, substantially reducing preventable patient harm while establishing replicable, evidence-based pathways for healthcare system improvement.

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She has international experience as a pharmacist for Médecins Sans Frontières in the Middle East, serving rural communities and providing operational consulting to Australian allied health service providers.

With a commitment to improving health outcomes for vulnerable populations, she integrates practical industry experience with academic inquiry to strengthen coordination, quality, and sustainability in aged care and broader healthcare systems.

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With over two decades of academic experience, Luke specialises in Complex Problem Solving (CPS), specifically investigating how leaders interpret ambiguity and design solutions for "wicked" problems in digital environments. His research provides evidence-based frameworks for organisations seeking to navigate the human complexities of technological change.

ABOUT THE CENTRE FOR WORK, ORGANISATION AND WELLBEING

The Centre for Work, Organisation and Wellbeing (WOW) is an internationally recognised research centre within the Griffith Business School and one of Australia's leading work research groups.

WOW brings together expert researchers from across Griffith University, including Human Resource Management, Organisational Behaviour, Design and Engineering, Medicine, and Business Innovation.

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