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# “A banana in the tailpipe”: a qualitative study of patient flow in the healthcare system

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## Abstract

**Background** Suboptimal patient flow and impaired hospital access can lead to adverse outcomes, including lower care quality, higher mortality risk, and patient dissatisfaction. Despite awareness, optimizing patient flow remains an area requiring further development. This study aimed to comprehensively identify factors hindering patient flow in a large healthcare system and explore potential solutions, using a qualitative approach for context-specific insights.

**Methods** This qualitative study followed COREQ guidelines. We conducted four focus group discussions (FGDs) involving 23 healthcare workers (HCWs) and patients selected through purposive sampling. The data were analysed using the directed content analysis method, ensuring rigor through methods such as credibility, dependability, authenticity, and transferability. The study also mapped qualitative findings to outcomes from our recent umbrella review (UR) to enhance comprehensiveness.

**Results** Patient flow challenges were categorized into population (patients and providers), capacity, and process. Population challenges included community-based care, staffing issues, and inequities in access. The capacity challenges involved inefficient resource allocation, resource constraints, and patient volume growth. The process challenges included bed management, modernization struggles, private hospital issues, funding model problems, information sharing gaps, coordination challenges, transition issues, particularly delayed discharges from inpatient wards, and problems in healthcare management and patient communication. The solutions focused on human factors, infrastructure, and management, organization, and policy. FGDs identified new challenges and solutions were not covered in the recent UR.

**Discussion** The participants' insights highlight the critical necessity for systemic improvements, which include enhancing infrastructure, communication, and collaboration. These improvements include early identification of discharge barriers, facilitating community discharge, addressing diverse patient needs, optimizing prehospital services, and improving patient communication. Shifting the focus from traditional emergency department processes to a system-wide approach is crucial. The comparative mapping between FGDs and the UR insights into both common and specific challenges and solutions enriches discussions on healthcare reform.

**Keywords** Patient flow, Healthcare system, Challenges, Solutions, Qualitative study, Stakeholder perspectives, Focus group discussions (FGDs)

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## Summary box

### The known

Recent shifts in the healthcare system, driven by demographic changes, rising multimorbidity rates, and the COVID-19 pandemic, have resulted in an imbalance between healthcare supply and demand, leading to challenges such as overcrowded emergency departments and impaired access to hospital care.

### The new

The study identified diverse patient flow challenges grouped into three main categories: population, capacity, and process. It reveals new issues, including challenges with the fee-for-service model, activity-based funding, and information sharing dynamics.

### The implications

A complex systems approach is needed from the ED “front door” and the community “back door”. Solutions entail early identification of discharge barriers, facilitating community discharge, addressing diverse patient needs, optimizing prehospital service efficacy, and enhancing patient communication. Targeted interventions and policy adjustments tailored to local contexts are necessary to address emerging challenges and improve healthcare delivery.

## Background

In recent years, the healthcare landscape has undergone significant transformations driven by various factors, including changing demographics, the increasing burden of multimorbidity, the profound impact of the COVID-19 pandemic, and persistent shortages in healthcare staffing [1–3]. The combination of these factors has led to a significant increase in the demand for healthcare services, leading to an enduring imbalance between supply and demand [4]. This imbalance has resulted in a range of problems, such as delays in healthcare delivery, staffing insufficiencies, and suboptimal utilization of hospital resources. These challenges include overcrowded emergency units, a shortage of nursing staff, political pressures and an overall sense of dissatisfaction among healthcare professionals and the general public [5, 6].

At the core of this dynamic healthcare environment lies the emergency department (ED). EDs across the globe face persistent overcrowding challenges and grapple with the continuous increase in demand for healthcare services, presenting an enduring and substantial challenge to healthcare systems globally [7–10].

ED overcrowding and access block lead to adverse outcomes, including lower care quality, higher mortality risk, more medical errors, patient dissatisfaction, reduced hospital capacity, ambulance diversions, staff stress, longer

wait times, increased costs, and patients leaving without physician evaluation [7, 11–14].

Efficient patient flow is crucial for ensuring that patients receive timely and high-quality care. Poor management of patient flow can lead to disruptions within the healthcare system, affecting the overall quality and effectiveness of care delivery [15–17]. Inadequate patient flow can result in ED overcrowding, causing delays and obstacles in patient care [16]. Such inefficiencies pose an elevated risk to patient safety, ultimately resulting in increased morbidity and mortality rates [18, 19]. Despite this awareness, optimizing patient flow within the healthcare system remains a significant challenge [20].

Research has consistently demonstrated that addressing issues and bottlenecks related to patient flow can lead to numerous benefits and has a positive impact on patient outcomes. These include shortened length of stay (LOS), improved medical quality, improved safety, and improved patient satisfaction. Additionally, it optimizes the activity and funding of healthcare facilities [7, 10, 17, 21–26].

Improving patient flow extends beyond hospitals and requires a holistic approach, recognizing the healthcare system as a complex adaptive system consisting of a continuous care pathway [27–29]. This approach encompasses interventions that extend beyond the boundaries of hospitals, addressing ‘pre-ED’, ‘within-ED’, and ‘post-ED’ phases [11]. It aligns with the Quadruple Aim of Healthcare, emphasizing increased efficiency, improved population health, better consumer experiences, and enhanced provider satisfaction [30].

Many existing studies have certain limitations in their scope, often focusing on specific clinics, units within hospitals or even the entire hospital, without adequately considering the broader healthcare system as a complex adaptive system [5, 31, 32]. This traditional process mining approach does not sufficiently meet the need for a comprehensive, system-wide strategy required to effectively improve patient flow. Although numerous papers also address the matter of ED crowding, there is also a substantial knowledge gap concerning the fundamental causes of this issue as part of the overall healthcare system [13, 20].

Despite some research exploring patient and workforce perspectives [20, 33–37], there is still a significant gap in comprehensively collecting evidence regarding the challenges and solutions related to patient flow, both within the ED and across the broader health system. Recognizing the importance of patient flow and the value of incorporating stakeholder perspectives, this study aims to identify the factors that stakeholders perceive as hindering patient flow across the Queensland healthcare system while exploring potential solutions, considering the perspectives of healthcare workers and patients.

Additionally, the study aims to integrate these qualitative analysis findings with the outcomes of our previously published recent umbrella review to systematically advance the evidence base for solutions to poor patient flow and adverse outcomes [38].

## Methods

### Design

Our study was qualitative and followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) [39]. The COREQ checklist covers the reporting of studies using interviews and focus groups. It ensures that all aspects of the research process, including interviewer characteristics, participant selection, data collection methods, and analysis techniques, are transparently reported.

FGDs were chosen to foster interaction among participants, allowing them to express and clarify their perspectives in a collaborative environment, while also capturing their perceptions on a focused topic in a permissive and nonthreatening setting [40].

### Setting and participants

Participants were selected through purposive sampling from HCWs and patients. HCWs comprised managers and operational personnel from various sectors, including hospital and health services (HHSs), the Queensland Ambulance Service (QAS), primary health care centres, and residential aged care facilities (RACFs), across Queensland. Queensland, covering 1.73 million square kilometres with a population of approximately 5.2 million as of the 2021 Census, offers healthcare services through both publicly funded services by state and federal governments and private providers [41]. In addition to being employed during the study period, the inclusion criteria for employees included having extensive experience in addressing hospital patient flow challenges and proposing solutions.

Patients were also selected from the Consumer Advisory Committee at the Queensland Digital Health Centre (QDHeC). The inclusion criterion for patients was experiencing emergency care services. The inclusion criteria for both groups were interest and voluntary informed consent to participate in the study and the ability to communicate experiences to the research team.

Potential participants were identified through the professional networks of our research team. Once identified, they received an email invitation that included an approved Participants Information Sheet (PIS), which provides details about the research team, objectives, importance, research process, and expectations for participating in interview sessions. At the end of the PIS, participants were provided with a link to access the consent form and a demographic questionnaire in Qualtrics,

a web-based survey tool. Additionally, their preferences regarding the interview format (online or in person) and preferred interview times were asked about (Supplementary Material 1).

### Data collection

A semistructured focus group interview approach was utilized for data collection. The interview guide was developed based on the study objectives. Some general questions, including questions regarding experiences and satisfaction with patient flow, were supplemented by exploratory questions to gather richer data based on participants' responses (Supplementary Material 2). Pilot questions were tested through individual interviews with a general practitioner, a nurse, and a patient, but their data were not included in the final analysis.

Four focus group interviews, each lasting approximately 1½ hours, involved 5–7 participants per session. Efforts were made to ensure heterogeneity among group members to produce diverse and comprehensive data while maintaining homogeneity to prevent role diversity from hindering experience expression.

The sessions were facilitated by two female qualitative research experts: LM (PhD), Research Assistant, who served as the moderator, and MS (PhD), Research Fellow, who observed and took notes. Both have extensive experience conducting qualitative research in healthcare settings. They are trained to minimise any biases or assumptions, making sure the interview process stays neutral and focused on the participants' experiences. No non-participants were present during the FGDs. Discussions were held via Microsoft Teams and were recorded both in audio and video formats. Video recording was utilized to capture participants' nonverbal communication and ensure accurate transcription of the discussions.

### Data analysis

Data collection and analysis were conducted simultaneously. Following each interview, the data analysis was guided by the directed content analysis method. The rationale for choosing this approach was to utilize the conceptual framework from the project's initial stage (UR) within the broader SUPAFLOW project. This Emergency Medicine Foundation (EMF)-funded project involves a five-step approach to improve emergency access performance in Queensland's largest public hospitals. These steps include a literature review, analysis of public data, retrospective data analysis from 25 hospitals, a qualitative assessment of discharge barriers, and the development of actionable recommendations.

The analysis was carried out in three stages using the Elo and Kyngäs method [42]. In the readiness stage, each interview was selected as the unit of analysis. The text from each interview, generated by software, was

repeatedly read and meticulously cross-checked with the audio file by LM and MS. This process ensured the accuracy of the transcriptions and helped immerse the researchers in the data. This process not only ensured the accuracy of the transcribed text but also immersed researchers in the data. While reading the text, attention was given not only to the main research question but also to other aspects, such as who is speaking, what is happening, why, where and when, allowing researchers to deeply engage with the data. For data processing, NVivo software version 12 was used to assist in the analysis of the acquired data [43].

In the second stage, data organization was conducted by LM and MS. For this purpose, a classification matrix was developed based on categories and subcategories derived from the literature review. Codes were extracted based on this matrix and placed into categories. Due to the importance of participants' backgrounds and experience features, an unstructured matrix was utilized. This means that in cases where the data did not fit into a pre-defined matrix, these data were classified using an inductive approach and added to the existing categories. After analysing each interview, the initial text, codes, and classification method were provided to the supervisor (CS) for review and oversight.

In the final stage, the analysis report was prepared. The main categories were described through subcategories. Additionally, appropriate quotations were used to illustrate the relationships between the data and the categories (Table 1).

**Rigor (reliability and validity)**

To ensure credibility, a pilot interview was conducted to refine the overall process, including the interview protocol, time management, and overall operation of the interviews. Moreover, sampling continued iteratively until saturation was reached (the point at which new data became redundant, and no new information or themes emerged) [40, 44]. Although the data analysis was guided by directed content analysis due to the research objective,

an unstructured matrix was used, meaning that the researchers remained open to new data. For dependability, two researchers conducted the data analysis, engaging in discussions until consensus was reached; the supervisor also provided guidance as necessary. Finally, raw data, along with the analysis, were provided to the team leader for final oversight and review. Various quotations were used to enhance authenticity, demonstrating the relationship between the raw data and the extracted themes. To enhance transferability, sampling was conducted with maximum variability, particularly considering variables such as professional role, work setting, and academic and professional background. To facilitate judgment on transferability, a detailed description of the context and participants was provided. In addition to the above measures, prolonged engagement with the topic and data aided in accurate interpretation [45]. Member checking was also performed by participants, with no reported discrepancies noted during participant reviews.

**Ethical consideration**

This study obtained ethics approval from the relevant ethics committee. Participants provided consent both before and during the sessions by completing a consent form and verbally confirming their agreement. Verbal consent and permission to record audio and video were obtained from the participants. To protect participant privacy, original video files were deleted after transcription. In the report, the primary identifiers of participants were omitted to prevent individuals from being identified through quotations.

**Mapping qualitative findings to the umbrella review**

We enhanced our FGD findings by integrating them with our UR outcomes [38] through comparative mapping tables. This approach allows for a clear comparison between the two methods, aiding in the identification of commonalities and distinctions in our qualitative analysis.

**Table 1** Example of analysis process

Category	Subcategory	Code	Illustrative quotes
Process	Transition challenges	Challenges in timely medical rounds and consultation assessments	"So for example, if the medical consultants do their rounds, they might do outpatients in the morning and they come up to the wards and do their rounds in the afternoon . . ." (F2P8) "But there's been extensive delays and getting assessments done taking about 12 hours or more than 12 hours before anybody would engage or like . . . sort of mentioned earlier, they will do their clinic in the morning and they will come after 4:00 o'clock..." (F2P11)
		Delayed discharges from inpatient wards	"I guess we're the back end of patient flow at the moment being RACFs and in that space we do experience a lot of challenges getting people into our RACFs, which then has a direct impact, I guess on the maintenance patients within the hospital." (F1P5) "So in high risk patients are discharged from hospital about the ability to get them, maybe a GP appointment or ancillary service or sometimes it's not even a GP, maybe it's them being able to have an OT assessment and these sorts of things, I think really hold up discharge to the community and also allowing patients or helping patients to stay there and not be readmitted, I think it's a big challenge." (F1P1)

**Table 2** Focus group membership for healthcare workers

Role of participants	Number	%
ED Director and emergency medicine specialist	5	29.4
Patient flow directors	2	11.8
Hospital Nursing directors	3	17.6
RACF nursing director	2	11.8
General practitioner	2	11.8
Advanced care paramedics	3	17.6
Total	17	100

## Results

### Participant demographics

Out of the 48 participants invited, 17 did not respond after three reminders, and eight dropped out due to workload issues and scheduling conflicts, resulting in 23 final participants. We conducted four focus groups: three with HCWs and one with patients (Table 2). Despite diverse staff representations, participants consistently highlighted similar concerns, indicating data richness and adequate sample size. Among the participants, 52.2% (12/23) were male, and 47.8% (11/23) were female. Most HCWs (53%) were aged 30–45 years, and most patients (60%) were aged  $\geq 45$  years. Among HCWs, 70.6% had bachelor's or master's degrees, and 76.5% had clinical backgrounds. The most common job duration was

5–10 years (35.3%). Most patients (67%) had a bachelor's degree.

### Main categories and subcategories of patient flow focus group discussions

The process of open coding produced 378 coded extracts. The analysis revealed three main categories and several subcategories (Table 3).

#### Patient flow dynamics and scope

Participants confirmed the importance of patient flow and highlighted persistent challenges. The scope of patient flow was viewed broadly, encompassing all aspects of care from home to hospital and back to the community. Patient satisfaction varied, and while interventions showed potential, challenges persisted (Table 1, Supplementary Material 3).

*“... So to me, patient flow is the movement of our patients into and out of our facilities and our health-care service in general ...” (F2P8)*

*“We actually are gradually drifting down on the standards that we are prepared to accept, and we're doing it for the right reasons, but we're not acknowledging the impact this has on people, and the care*

**Table 3** Main categories and subcategories of patient flow focus group discussion

Main Category	Category	Subcategory
Patient flow dynamics and scope	Persistent challenges in healthcare patient flow	
	Broad scope of patient flow	
	Confirmation of the importance of patient flow challenge	
	Variable patient flow satisfaction	
Patient flow challenges	Population (Patients & Providers)	Challenge of community-based care
		Challenges in staffing
	Capacity	Inequities in access to high-quality care services
		Challenge of inefficient resource allocation
		Patient volume growth
	Process	Bed management challenges
		Challenges in modernizing the healthcare system
		Challenges in private hospital system
		Fundamental structural problem in the funding model
		Gaps in sharing information about the patients
		Lack of effective systemic coordination- Silos in Healthcare
		Transition challenges
		Challenges in healthcare management and patient communication
Patient flow improvement solutions	Human factors	
	Infrastructure	
	Management-Organization-Policy	
		Community health and diverse patient needs accommodation (Community health-related solutions & accommodating the diverse needs of patients)
		Communication and collaboration
		Directing patients for appropriate care
		Health system and process improvement
		Transition solutions

*we wanna give versus the care we're allowed to give in the system we have."* (F1P2)

### Patient flow challenges

The challenges in the population (patients and providers) category included community-based care obstacles, staffing issues, and inequities in accessing quality care (Table 2, Supplementary Material 3).

### Challenges of population (patients and providers)

The population (patients and providers) challenges included the subcategories "community-based care," "staffing," and "inequities in access to high-quality care services" (Table 2).

**Challenges of community-based care** The participants highlighted challenges in community-based care (Table 3, Supplementary Material 3), including peak demand during weekends and winter, inappropriate emergency service use due to low health literacy, and discharge delays in regional areas due to limited social services, blocking emergency department beds.

*"So we need, so there's so much criteria on discharge that sometimes we keep them in just another day, cause we can't access a physio, we can't access, you know, a dietitian... holds up a bed day for us, and as a consequence, we have they're blocked down in the ED."* (F3P16)

Virtual assessments were ineffective, and financial barriers limited access to home care, leading to ED overuse. Vulnerable individuals faced care coordination challenges, including hospitals not returning permanent residents to aged care facilities.

*"Hospitals not returning permanent residents back following an ED presentation even as a Public run RACF and there is limited pathways to Post-Acute Care Service (PACS)/ Hospital in the Home (HITH) or trust that the RACF staff can provide the care within the facility."* (F2P12)

Underdeveloped community paramedicine, inconsistent GP care, and limited bulk-billing options further strained the system. Elderly care access was also problematic, with patients often waiting for crises before receiving resources.

*"I think people's access to primary care GPs... it's becoming to find bulk billing GP's and so that part of the system then flows into the public system and creates greater pressure."* (C3)

*"I think people's access to primary care GPs, is, you know, like it's becoming more difficult to find bulk billing GP's and so that part of the system then flows into the public system and creates greater pressure."*

**Challenges of staffing** Participants described staffing challenges in healthcare, including burnout, recruitment and retention issues, salary disparities, and inadequate support systems. Burnout is common due to the long hours and heavy patient loads. Salary gaps and recruitment struggles are particularly notable in remote areas. A declining interest in emergency medicine careers post-COVID-19 worsened the shortage of qualified professionals. Inadequate patient flow training compounds these challenges, as inadequate support systems fail to address frontline workers' needs, diminishing patient care quality and overall system performance (Table 4, Supplementary Material 3).

*"And particularly post COVID suddenly that fact where you went to work and you had a higher than zero chance of dying on a daily basis kind of made people go... And plus it's become an increasingly stressful environment since then. So fewer people are going into training."* (F1P2)

*"There's no... it's all just a bunch of people going to work trying to do the right thing, but the system itself not necessarily supporting them to do that ... and that is to work those long hours and also maintain a level of equanimity and emotional stability."* (C4)

**Challenges of inequities in access to high-quality care services** Participants highlighted challenges in accessing high-quality care, mainly due to financial barriers, with many resorting to emergency departments due to affordability issues (Table 5, Supplementary Material 3).

*"GPs offer a fantastic value for money ..., but I think that they're perhaps have been gradually underfunded. And access and availability of GPs is certainly something that patients use as a factor for why they're seeking care in emergency department."* (F3P17)

*"...lack of bulk billing availability is putting enormous burden on the ED departments"* (C2)

Participants recounted cultural and gender biases, disability accessibility issues, and language barriers that complicated their access to appropriate care.

*"My barrier is the language, not able to describe the symptoms precisely due to the language barrier"* (C5)

### Challenges of capacity category

Challenges within the capacity category highlighted two subcategories: “inefficient resource allocation and resource constraints” and “patient volume growth” (Table 2).

### Challenges of inefficient resource allocation and resource constraints

The participants described significant challenges due to inefficient resource allocation and constraints (Table 6, Supplementary Material 3). Financial limitations hinder healthcare service expansion, preventing the construction of more hospitals despite increasing demands. Limited inpatient bed availability and morning bed shortages are critical issues exacerbated by aging infrastructure.

*“I’m going to say inpatient bed availability. So I know our hospital in ... is probably 30 plus years old and we have not had an increase in bed stock in that time.” (F1P5)*

There is also a noticeable shortage of medical staff, including junior doctors, GPs, and nursing staff, with increased sick leave further constraining resources. Resource allocation challenges lead to frequent reallocations of staff from emergency departments, impacting patient care. Staffing constraints during overtime and weekends are prevalent, with patient transport services often unavailable, resulting in care delays.

*“Sometimes on a busy night shift just because simply that that return home job is very low, low priority and we often don’t have patient transport officers working overnight time or over the weekend” (F1P3)*

**Challenges of patient volume growth** The participants highlighted a growing challenge in managing patient volume growth. Changing demographics and increasing demands in emergency departments exacerbate this issue. The high demand for aged care beds results in many elderly patients remaining in hospitals for extended periods (Table 7, Supplementary Material 3).

*“... And then all of the hoops that they’ve got to jump through to be able to access an aged care bed. So those, once they reach ED, they are then in that hospital for quite a period of time.” (F1P5)*

Participants reported that there was a rise in patients seeking care from GPs, overwhelming the system. Challenges in inpatient bed allocation for specialty patients with complex care needs result in discharge delays and prolonged hospital stays. The overuse of emergency services for nonemergency visits and frequent patient readmissions disrupt hospital operations and efficiency.

*“I’d also add. Readmissions, I think, is a real challenge.” (F1P1)*

### Challenges in the process category

The process category encompasses various subcategories (Tables 8 and 9, Supplementary Material 3):

**Bed management challenges** Participants identified significant issues in managing patient flow despite adding new beds. Mere bed increases provide temporary relief without addressing underlying issues. Tasks related to bed allocation consume valuable time, diverting resources from patient care.

*“We know that if you open up beds, you fill them up, you don’t necessarily change anything, you get an artificial improvement for a period of time.” (F2P6)*

**Challenges in modernizing the healthcare system** Participants identified significant challenges in modernizing healthcare, citing inefficiencies in handling patient flow data and resistance to change. The traditional five-day healthcare model is outdated, hindering efforts toward long-term sustainability.

*“We’re stuck with ways that relate to historical processes. But in a world that has changed around us. We’ve traditionally had the situation by which ED has done a lot of things for the hospital as a whole and sucked up a lot of problems.” (F1P2)*

**Challenges in the private hospital system** Participants highlighted a disconnect between the public and private healthcare systems, particularly concerning day procedures. Private hospitals lacking financial incentives for urgent care complicate referrals, leading to patients being redirected elsewhere. This results in additional ambulance transfers, worsening patient flow challenges.

*“... it’s frustrating as hell for us when the crews turn up and the patient’s like, I wanted to go to ... (one private hospital), and they said no. And there’s no comeback on them. trying to get the patient to them is an absolute nightmare that will then involve another QAS transfer, which I think you guys clock in about two and a half grand per transfer.” (F1P2)*

### Fundamental structural problems in the funding model of the healthcare system

Participants highlighted a fundamental structural problem in the healthcare system’s funding model, especially regarding the fee-for-service model for GPs. This model incentivizes treatment over prevention, as funding is based on patient presentations rather than avoiding admissions. Hospital funding mechanisms, driven by activity-based funding

(ABF), create disconnects between medical and surgical admissions, leading to flow inefficiencies. Additionally, there is a lack of incentives for preventive care, exacerbated by outdated models prioritizing acute care over chronic disease management.

*"Which is like ... was describing before we've got these outdated and anachronistic health system models and funding models that are set up for acute care, not for complex chronic disease care, which is what we have. That is the reality that we deal with now." (F1P1)*

**Gaps in sharing information about the patients** Gaps in sharing patient information present significant challenges in healthcare, leading to unnecessary tests and burdens on both patients and the system.

*"an example might actually be more like, additional tests that have just been done in the Community or at one part of the Community practice that we don't know about... they're done in the hospital outpatient department, and then they're done again in the general practice, you know." (F1P1)*

Participants highlighted significant issues in patient information sharing, such as unnecessary tests, challenges in coordinating between public and private providers, and difficulties with health passports due to complexity and low engagement. Data sharing restrictions hinder access across care levels, leading to inadequate information for QAS staff and GPs' real-time access. Limitations of My Health Records and privacy concerns in healthcare information sharing further impact patient care.

*"I had an appointment with the cardiologist and she goes, 'Ohh, so you've got an overactive thyroid, has your GP been in touch?'. So, what had happened was the tests hadn't, the results of the test hadn't gone to my GP, and it wasn't in the discharge letter." (C3)*

**Lack of effective systemic coordination** The lack of systemic coordination in healthcare poses significant challenges. Blurred lines of care coordination between GPs and EDs in satellite hospital centres create fragmented patient pathways. Challenges in maintaining multidisciplinary rounds exacerbate coordination issues, affecting patient outcomes. Communication challenges among stakeholders hinder seamless care transitions. Fragmented coordination and communication highlighted systemic inefficiencies. The role and efficacy of satellite hospitals are questioned due to cost misalignments. Varying levels of understanding of patient flow within the

organization highlight the need to foster interdepartmental communication.

*"Varying levels of understanding of patient flow within the organization highlight the need for fostering interdepartmental communication." (F2P10)*

**Transition challenges** Participants described various challenges within the patient care transition phase. Access block with admitted patient boarding emerged as a significant issue, causing delays in care due to limited bed availability. Patient selection for ambulance transport complicated flow and efficiency, while referring patients to other providers, particularly for specialized care, presented obstacles. Timely medical rounds and consultation assessments were hindered, leading to discharge delays and prolonged stays. Inadequate planning and operation of transit lounges exacerbated these challenges, causing bottlenecks. Interhospital transfers added complexities in managing care transitions and coordinating care, further straining the healthcare system's capacity for seamless patient transitions and continuity of care.

*"So for example, if the medical consultants do their rounds, they might do outpatients in the morning and they come up to the wards and do their rounds in the afternoon. So those discharges aren't happening until later in the afternoon, so therefore the patients are in ED all day waiting for that." (F2P8)*

Participants noted delays in hospital admissions, compounded by ambulance delays, direct ward admission challenges, increased ambulance staff workload, knowledge gaps about hospital capabilities, and delays in ambulance calls. The study also highlighted delayed triage and handovers due to busy nursing staff.

*"I guess the other barrier to patient flow would be there's often lengthy delays with handover. So a nursing staff are very busy and it wouldn't be unusual to wait 10–20 minutes for a nurse to free up for hand over." (F2P9)*

Delays in discharging patients from inpatient wards present challenges such as ensuring follow-up services to prevent readmissions, transitioning patients from acute care, managing prolonged decision-making due to factors such as medical coverage and workload, patient retention, transport delays, and prolonged wait times for discharge scripts and allied health services.

*"Whatever issue presenting issue immediately, there isn't that follow up to then plug me into or make sure that I have support once I leave the emergency*

*department. If I'm not being admitted to the ward, which sometimes I am, sometimes I'm not." (C3)*

*"I guess we're the back end of patient flow at the moment being RACFs and in that space we do experience a lot of challenges getting people into our RACFs, which then has a direct impact, I guess on the maintenance patients within the hospital." (F1P5)*

**Challenges in healthcare management and patient communication** Participants identified significant challenges in healthcare management and patient communication, particularly in emergency care for patients with multiple health conditions. These included delayed identification of medication side effects and treatment, lack of fast-tracking for lifelong patients, and communication issues with overworked physicians. There were challenges in timely access to clinical tests, all of which contributed to poor patient outcomes.

*"if you've got a complex problem that the registrar's really don't know about it, and they can't know everything. So that's understandable, but there is no fast tracking of people who are patients for life or who have these rare conditions that, you know, in general aren't known about." (C4)*

*"They did an ultrasound on his knee and once again he slipped through the cracks and after that I think it was four hours. That time I went to the window and said 'what's happening with my husband?' and they said 'Oh hasn't he been discharged?' I said 'no, we're still waiting here' (C1)*

#### Patient flow improvement solutions

In the main category of patient flow improvement solutions, three critical categories were identified: "human factors", "infrastructure", and "management-organization-policy" (Table 10, Supplementary Material 3).

##### Human factors solution

The participants emphasized the impact of team leaders and nurse navigators in managing hospital patient flow challenges and stressed the importance of utilizing experienced doctors during emergencies to alleviate emergency room overload. Integrating GPs into emergency departments was noted to broaden the medical care focus and enhance the overall quality of emergency care. Public health education on appropriate healthcare and ambulance service utilization has emerged as a critical factor. Participants also discussed the vital roles of nursing staff in patient flow programs, underscoring the importance of trusting triage nurses for effective patient care guidance.

Executive buy-in was emphasized as essential, highlighting the significance of top-level support for program success. Education and workforce development for nurses, prehospital staff, and paramedics were deemed crucial for informed patient selection, transport decisions, and safe field discharge across diverse healthcare settings.

*"I guess my main point is really look after your staff, because they're the ones looking after us" (C3)*

*"... that's education is always the first thing to go in our hospitals, especially for nursing. And I think what we need to do is reinvest in education and get. Because we know that the universities just aren't turning out the nurses at the quality that they were." (F3P16)*

##### Infrastructure solution

Participants emphasized infrastructure solutions for enhancing patient flow, stressing the need to balance bed expansion with workforce shortages (Table 12, Supplementary Material 3). They highlighted that solely increasing bed capacity without addressing staffing deficiencies would not resolve efficiency issues. Optimal hospital operations rely on effective resource utilization, encompassing both beds and staff. Resource redistribution and initiatives such as transit care hubs were suggested to mitigate risks and enhance patient flow. Moreover, expanding ramps to streamline patient movement within the healthcare system were discussed.

*"we don't need the additional beds and all of that sort of stuff. We are operating well... it's how we pull it all together and have the right people with the right skills to be able to provide that in a in a format that is informative as opposed to in summative." (F2P6)*

##### Management-organization-policy solution

This category encompasses strategies for enhancing healthcare management and organizational policies (Tables 10 and 13, Supplementary Material 3):

**Diverse patient needs** Participants emphasized accommodating diverse patient needs via primary care and community health initiatives. They proposed utilizing Medicare for extended GP hours and enhancing care for older adults (integrated geriatric care, real-time fall response teams). The involvement of private insurers in preventive healthcare was suggested, as was the exploration of community-based alternatives such as local tertiary services, home care, and community paramedicine. Prioritizing patient-centric care was deemed vital for enhancing outcomes and satisfaction.

*"So it's the community supports and the early identification and the access to the services that these people require to I guess, bypass the emergency department and give them the care and the support that they need within that Community environment, and then access at the point of time that they need to access an RACF rather than reaching that crisis point." (F1P5)*

**Communication and collaboration** Effective communication and collaboration throughout the healthcare system emerged as a consistent topic throughout the discussions, highlighting the need to integrate healthcare services for continuity of care and meeting patient expectations. Participants stressed a cultural shift towards collaborative management and seamless information flow from executives to frontline staff. Improving collaboration between medical specialties, implementing a mental health first responder model, and enhancing the collaboration of ambulance services with Retrieval Services Queensland (RSQ) were noted as vital for optimizing patient flow and outcomes. Promoting patient-centric care in healthcare was emphasized as essential.

*"And it's just trying to support them to do better in a way that we always have patients at the centre of all our decision making." (F2P10)*

**Directing patients for appropriate care** The participants highlighted the significance of improving ambulance services to reduce hospital transports, along with utilizing clinical hubs, telehealth services, and digital health to enhance prehospital care. The implementation of patient navigation programs and a primary health coreponder model to divert ED visits were discussed as solutions. Facilitating timely treatment for triage categories 'fours and fives' in an interim admission center to reduce waiting room occupancy was also described.

*"So we're really just trying to capture those patients before, because often a lot of people, we find that a calling in, that they're not really sure how to navigate the health system and they're just wanting some advice and some health literacy. So it's really trying to just redirect those patients the best we can, whether it even be." (F1P4)*

**Health system and process improvement** Participants described the importance of quick access to patient information and addressing privacy challenges for timely follow-up care. Streamlined action planning and accountability in private healthcare were seen as crucial for enhanced patient care. The participants also highlighted the importance of adopting an appreciative

approach rather than blaming to foster collaboration within the health care environment. Empowering patient independence and safety through initiatives such as grab rails and home modifications was advocated. Enhancing patient flow through coordinated decision-making and data-driven solutions was emphasized. Adopting holistic approaches to bed block management and changing the approach to system-level operations, along with testing new strategies, was deemed essential. Strategies to mitigate political influences on healthcare decision-making and optimize hospital operations for predictable patterns were emphasized. Prioritizing tasks and transitioning to a seven-day healthcare service model were suggested for organizational efficiency. The development of patient-centric tools such as a real-time ER triage app was recommended to improve the patient experience during emergency visits and meet urgent care expectations.

*"And when my discharge summaries are promptly provided to my GP, I feel better supported and safer that when I leave I will be well cared for." (C3)*

*"... Without trialling new models of care and strategies, we won't know how well they work. We need to test them in practice." (F2P11)*

*"So and there are examples from across, probably in the United States where they've moved to a seven day model and have actually realised a lot of benefits and saved hundreds of millions of dollars in preventing another hospital being built so, but I guess that it's a complex conversation because we've never had it ever." (F2P10)*

**Transition to seven-day health care service** Participants suggested using offload paramedics in hospitals to improve patient flow. They could help with tasks such as blood draws and patient movement, speeding up procedures and transitions in the emergency department. Early identification and streamlined placement for patients needing RACF beds are vital for resource efficiency. Intermediate care solutions for swift transitions to maintenance care were also emphasized. Streamlining direct admissions to hospital wards and early senior ED physician reviews for stable patients were effective strategies to reduce bottlenecks. Using predeparture checklists in the ED was proposed for better service coordination.

*"Identification early of patients that are potentially going to need referral to an RACF bed." (F1P5)*

*"So and for us in particular, it was the direct admission process. So moving from a push model to a pull model." (F1P2)*

### Mapping qualitative findings to the UR

Comparative mapping tables were utilized to present this integration, enhancing comprehension (Supplementary Material 4, Tables 1-7). The comparison of our qualitative study and the UR highlights the complex challenges facing Queensland's healthcare system. Both sources identify issues such as peak demand, staff burnout, and financial barriers, emphasizing the need for systemic improvements in infrastructure, communication, and collaboration.

FGDs identified new patient flow challenges not mentioned in the UR, such as limitations in virtual patient assessments, the implementation of community paramedicine roles, and decreased interest in emergency medicine post-COVID-19. Specific Australian healthcare staffing issues, such as GP sustainability and recruitment, were also highlighted. FGDs noted healthcare access disparities related to cultural inclusivity, gender, and disability. Inefficiencies in bed management, the integration of modern healthcare practices, structural funding problems, and a lack of incentives for preventive care were discussed. In the private hospital system, the disconnect with public services and financial disincentives for emergent care were emphasized. Challenges in sharing patient information and real-time access for GPs were also noted.

FGDs identified several new solutions for improving patient flow not mentioned in the UR. These include leveraging experienced doctors in emergencies, public health education on proper ED use, increasing bed availability, launching transit care hubs, providing free primary care for the uninsured, comprehensive geriatric assessments, integrated care models for better team coordination, data-driven management to optimize patient flow, streamlined discharge processes, and direct hospital admissions to bypass ED consultations.

Additionally, new insights reveal diverse patient needs and structural problems in the funding model, such as issues with GP payment systems and private hospital dynamics. Privacy concerns and limitations in information sharing also emerge as important considerations.

## Discussion

### Patient flow dynamics and scope

The discussions highlight the broad scope of patient flow, involving the movement of patients in and out of healthcare services [46]. The insights from FGDs highlight persistent challenges, including delays in high-acuity cases and prolonged waiting times. These findings align with other studies indicating that crowding in healthcare leads to delayed service, poor care quality, and inefficiency [46–50]. Participant-reported issues, such as frequent hospital visits and varying quality of care for general practitioners, echo broader concerns in the literature regarding inconsistent care quality [51, 52]. Participant

experiences highlight the urgent need for comprehensive interventions to address overcrowded emergency medicine.

### Patient flow challenges

Just as a banana in a tailpipe disrupts a car's performance, unforeseen barriers can hinder patient flow in the healthcare system. Other studies have also highlighted similar challenges of community-based care, including demand fluctuations, coordination challenges for vulnerable individuals, access barriers to primary care, and the lack of social and community services to aid in the discharge of difficult patients [5, 13, 15, 53–61]. Our findings on virtual models for patient assessments align with an editorial stating that 'virtual EDs' are not designed to offer the same comprehensive care as a 'real' ED [62].

FGDs highlighted staffing challenges affecting patient flow, echoing other studies citing high stress levels, burnout among ED staff [56, 60, 63], excessive workloads [58, 64], high rates of staff turnover [58], and training gaps for patient flow among healthcare workers [60]. Participants noted difficulties in recruiting and retaining experienced medical professionals, especially in remote areas, citing declining interest in emergency medicine post-COVID-19, GP sustainability concerns, and salary disparities between locum and permanent staff as specific staffing challenges within the Australian healthcare system.

FGDs highlighted challenges in accessing high-quality care, including financial barriers to accessing GPs, cultural inclusivity, gender disparities, disability accessibility, and language barriers. Similar challenges have been noted in other studies [5, 63]. Addressing these disparities is crucial for developing targeted interventions and policies aimed at improving access to high-quality care services for all individuals.

FGDs and prior research confirmed issues such as inefficient resource allocation, limited bed availability, healthcare understaffing, and reduced funding [5, 11, 53–55, 57, 60, 64]. Prior studies align with participants' challenges regarding patient volume growth, including inappropriate ED utilization, increasing demands on emergencies [58, 60, 64], and high demand for aged care beds [59, 65]. Our participants also noted increased demand for GPs in Queensland.

FGDs and prior research have identified various patient flow challenges in the process category, such as bed management inefficiencies and communication gaps between stakeholders [5, 11, 13, 53, 54, 57, 58, 60, 61, 64, 66, 67]. Our FGDs identified challenges in bed management, such as handling patient flow with new bed additions and time-consuming tasks related to bed allocation. These operational challenges are not unique to Queensland's public hospitals and have been noted in other studies

[68, 69]. Similarly, communication challenges between stakeholders, poor care coordination between GPs and EDs, and lack of integration between EDs and inpatient services are systemic issues across various healthcare systems [5, 11, 54].

Our FGDs identified context-specific systemic coordination challenges, such as multidisciplinary rounds, interteam communication, and the role of satellite hospitals within Queensland's health system. These findings align with other studies discussing fragmented bed management processes and the lack of healthcare network integration [5, 54, 70]. Our FGDs identified structural problems in the funding model, including issues with fee-for-service systems for GPs and EDs, preventive care incentives, and insurance or Medicare coverage. These findings suggest the need for global budgets to replace traditional payment models, along with strategies to improve population health and adjust hospital incentives for ED operations [71].

Our FGDs identified challenges in modernizing the healthcare system, including resistance to change and concerns about the long-term sustainability of the current healthcare model, aligning with other studies. Change management education and leadership training can help address these challenges [72].

Furthermore, our study highlighted gaps in sharing patient information, aligning with other studies that discuss the burden of unnecessary tests and information-sharing restrictions [13, 53, 58].

Participants described various transition challenges noted in other studies, including delayed discharge, difficulties diverting low-acuity patients, ineffective care transitions, and consultation delays [54, 58, 61, 66, 67]. Discharge planning and care transition interventions are commonly employed to improve outcomes for lower-acuity inpatients [73].

#### **Patient flow improvement solutions**

Participants stressed the importance of effective primary care and transitional care for older adults as solutions for patient flow. Our FGDs introduced therapeutic community environments, emphasizing patient-centric care, aligning with existing studies [59, 61]. Improved information flow between stakeholders and better access to patient information for physicians were highlighted as key solutions, supported by evidence [67, 74, 75]. Community-based healthcare enhancements, including local tertiary services and home-based care, were proposed to improve health system access, as seen in other studies [11, 59, 61]. Process improvement strategies such as triage processes and discharge management were emphasized to ensure timely handovers and discharge, consistent with prior research [60, 61, 65, 74, 76]. Operational changes such as early identification of discharges and

streamlining placement in the RACF were suggested, along with the effectiveness of direct admission to hospital ward processes, as supported by the study [77, 78].

#### **Comparative mapping of FGDs and UR**

Mapping qualitative findings to the UR showed how the results of our qualitative analysis supported in the existing body of literature and findings about challenges and potential solutions within Queensland's healthcare system. The comparative mapping revealed common issues such as demand fluctuations, staff burnout, limited bed availability, and ineffective care transitions. FGDs introduced challenges specific to the Queensland or Australian context, such as recruitment and retention in remote areas, post-COVID-19 declines in interest in emergency medicine, and salary disparities. Unique FGDs insights include cultural inclusivity, better resource allocation, and improved stakeholder communication, especially regarding bed management and allocation. These findings highlight the necessity for tailored interventions and policy adjustments to address the unique complexities of healthcare delivery [13] in Queensland, highlighting the significance of multifaceted interventions across human factors, management, and infrastructure domains.

#### **Conclusion**

In conclusion, this study offers valuable insights into the challenges facing Queensland's healthcare system, particularly concerning patient flow in hospitals. By analysing the attitudes and opinions of healthcare workers and consumers, we identified critical issues and proposed detailed recommendations. Our findings highlight the importance of prioritizing the patient experience and implementing comprehensive solutions to improve efficiency in EDs. Our recommendations advocate for a holistic, patient-centric approach to healthcare delivery. A complex systems approach is needed from the ED "front door" to the community "back door". Solutions entail early identification of discharge barriers, facilitating community discharge, addressing diverse patient needs, optimizing prehospital service efficacy, and enhancing patient communication. Addressing transition challenges and operational bottlenecks requires strategic interventions and policy adjustments tailored to local contexts. By investing in human resources, optimizing processes, and exploring diverse healthcare alternatives, a more efficient and effective healthcare system in Queensland will be developed. The comparative mapping between FGDs and the UR showed how our qualitative analysis results are supported by existing literature and identified specific challenges and potential solutions within Queensland's or the Australian healthcare system, enriching the healthcare reform discussion.

## Abbreviations

ABF	Activity-Based Funding
COREQ	Consolidated Criteria for Reporting Qualitative Research
COVID-19	Coronavirus Disease 2019
ED	Emergency Department
FGDs	Focus Group Discussions
GP	General Practitioner
HCWs	Healthcare Workers
HHSs	Hospital and Health Services
HITH	Hospital in the Home
PACS	Post-Acute Care Service
QAS	Queensland Ambulance Service
QDHeC	Queensland Digital Health Centre
RACFs	Residential Aged Care Facilities
RSQ	Retrieval Services Queensland
UR	Umbrella Review

## Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12913-025-12873-9>.

Supplementary Material 1.

Supplementary Material 2.

Supplementary Material 3.

Supplementary Material 4.

Supplementary Material 5.

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## Authors' contributions

MS: Conceptualized and designed the study, developed the methodology, conducted focus group discussions, performed the data analysis, and wrote the first draft of the manuscript. AS, JB, SK, and JA: Contributed to the design of the study, participated in interpreting the data, and provided substantial revisions to the manuscript. EB, DB and JL: Provided critical guidance and advice throughout the study, contributed to the development of the methodology, and offered comments on the manuscript. LM: Moderated the focus group discussions, reviewed the transcription, observed and took notes during the sessions, and made significant revisions to the manuscript. CS: Supervised the entire study, contributed to the conceptualization and design, interpreted the data, reviewed the codes, and provided revisions to the manuscript. All authors have thoroughly reviewed and approved the final submitted manuscript.

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## Data availability

All data generated or analysed during this study are accessible in this published article and its supplemental information files.

## Declarations

### Ethics approval and consent to participate

Our study was submitted to and approved by the ethics committees. Ethics approval for healthcare workers was granted under HREC/2023/MNHB/91304 by the Metro North Health Human Research Ethics Committee (HREC) B (EC00168). Additionally, ethics approval for patient participants was granted under Project Number 2023/HE001623 by Medicine LNR at The University of Queensland. Informed consent to participate was obtained from all participants. Participants provided consent by completing an informed consent form and verbally confirming their agreement. Verbal consent and permission to record audio and video were obtained before and during the sessions.

## Consent for publication

Not applicable.

## Competing interests

The authors declare no competing interests.

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