

Hallway Medicine: A convergent mixed methods study on perspectives from the frontlines of care

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ABSTRACT

INTRODUCTION: Hospitals are increasingly using hallway beds to address capacity challenges. Limited research exists about patients and health care providers' (HCPs) perception of care in these settings. This study assessed a hallway bed initiative on general internal medicine (GIM) wards and gathered feedback from HCPs and patients.

METHODS: Convergent mixed methods study conducted on six GIM wards in Alberta, Canada. Data included hallway bed utilization, patient complaints, and patient safety (PS) reports. Surveys were distributed to patients and HCPs. Data were analyzed descriptively, underwent thematic analysis, and compared.

RESULTS: A total of 913 hallway bed stays, involving 824 patients, were analyzed. Most beds (98%) were used mid-stay or near discharge, with median durations of 18.5–21.7 hours. Patients were predominantly male (57%) and aged ≥ 65 (42%). Patient complaints ($n = 9$) and survey responses ($n = 55$) revealed a lack of empathy, privacy, space, confidentiality, access to basic needs, dissatisfaction with bed location and expressions of gratitude for care. Twelve PS reports identified safety concern categories: falls, care transitions, and environmental risks. HCP survey responses ($n = 140$) aligned with patient feedback and additionally identified care delivery challenges, unclear criteria, poor staff morale, and advocacy to discontinue use.

DISCUSSION: Hallway bed usage is a short-term remedy to overcrowding. Findings emphasize the importance of making immediate improvements including stricter patient selection criteria and optimized staffing while also developing long-term, system-level strategies and infrastructural investments to reduce reliance on hallway beds, upholding patient dignity and provider well-being. These findings may inform interdisciplinary policy development and targeted initiatives in capacity management.

KEYWORDS: hospital bed capacity; quality improvement; internal medicine; patient satisfaction; patient safety and health personnel

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RÉSUMÉ

INTRODUCTION : Les hôpitaux utilisent de plus en plus les lits dans les corridors pour pallier les problèmes de capacité. Les recherches sur la perception des soins par les patients et les prestataires de soins sont limitées dans de tels contextes. La présente étude a permis d'évaluer une initiative d'utilisation des lits dans les ailes de médecine interne générale (MIG) et d'obtenir les commentaires de prestataires de soins et des patients à cet égard.

MÉTHODOLOGIE : Étude à méthodologie mixte convergente réalisée dans six ailes de MIG de l'Alberta, au Canada. Les données incluaient l'utilisation des lits dans les corridors, les plaintes des patients et les signalements sur la sécurité des patients (SP). Des sondages ont été distribués aux patients et aux prestataires de soins. Les chercheurs ont procédé à une analyse descriptive, puis à une analyse thématique des données, puis les ont comparées.

RÉSULTATS : Au total, les chercheurs ont analysé 913 hospitalisations de 824 patients dans les lits dans les corridors. La plupart des lits (98 %) étaient utilisés au milieu du séjour ou près du congé, et la durée médiane d'utilisation était de 18,5 à 21,7 heures. Les patients étaient surtout des hommes (57 %) de 65 ans ou plus (42 %). Les plaintes des patients (n = 9) et les réponses au sondage (n = 55) ont révélé un manque d'empathie, de respect des renseignements personnels, d'espace, de confidentialité, d'accès aux besoins fondamentaux, une insatisfaction à l'égard de l'emplacement du lit et des expressions de gratitude envers les soins. Douze signalements sur la SP ont rendu compte de problèmes de sécurité, dans les catégories suivantes : chutes, transitions des soins et risques environnementaux. Les réponses au sondage auprès des prestataires de soins (n = 140) étaient conformes aux commentaires des patients et ont également fait ressortir des enjeux relatifs à la prestation des soins, des critères imprécis, le manque de moral du personnel et les revendications pour cesser cette utilisation.

DISCUSSION : L'utilisation des lits dans les corridors est une solution à court terme à la surcapacité. Les résultats démontrent l'importance d'apporter des améliorations immédiates, y compris des critères de sélection des patients plus rigoureux et l'optimisation du personnel tout en élaborant des stratégies systémiques à long terme et en investissant dans les infrastructures pour limiter le recours aux lits dans les corridors et respecter la dignité des patients ainsi que le bien-être des prestataires. Ces résultats peuvent orienter l'élaboration de politiques interdisciplinaires et d'initiatives ciblées en gestion de la capacité.

MOTS-CLÉS : amélioration de la qualité; capacité des lits d'hôpitaux; médecine interne; satisfaction des patients; sécurité des patients et personnel de santé

LAY SUMMARY

Hospitals are increasingly placing patients in hallway beds to manage overcrowding, but little is known about how this affects patients and health care providers. This study looked at the use of hallway beds in one hospital across six general internal medicine wards in Alberta, Canada, and gathered feedback from both patients and health care staff. A total of 913 hallway bed stays involving 824 patients were analyzed. Most hallway beds were used either mid-hospital stay or just before discharge, with patients staying for about 18 to 22 hours. Most patients were male and over the age of 65.

Feedback from patients, including complaints and survey responses, highlighted concerns about lack of privacy, noise, limited space, and feeling a lack of empathy from staff. Despite these issues, some patients expressed gratitude for the care they received. Safety reports identified risks such as falls, environment concerns, and problems during transi-

tions in care. Health care providers also completed surveys, which revealed similar concerns. In addition, identified challenges such as care delivery challenges, unclear criteria, poor staff morale, and advocacy to discontinue use.

This study found hallway beds offer a short-term solution to hospital overcrowding but come with significant drawbacks. To improve care, hospitals should apply stricter criteria for hallway bed use, increase staffing support, and invest in long-term infrastructure changes. These findings may help guide future policies and processes aimed at improving patient dignity and supporting healthcare workers.

INTRODUCTION

Overcrowding in hospitals is a persistent and global health system issue linked to poor patient outcomes and health care providers' (HCPs) reduced ability to follow best practice guidelines, contributing to lower

quality of care.^{1–3} In response to emergency department (ED) and inpatient capacity strain, hospitals have adopted the placement of patients in unconventional care spaces, such as hallways, a practice known as “hallway medicine.”² Though intended as a short-term solution to improve patient flow, this approach raises concerns about safety, privacy, dignity, and quality of care.^{2–7} In Alberta, Canada, recent media reports highlight the growing use of hallway medicine, reflecting both a symptom and contributor of health system strain.^{3,8–11} Hallway medicine introduces clinical, operational, and ethical challenges.^{4,5} Clinically, patients placed in hallway beds face increased risks, including medication errors, delayed assessments, and falls due to inadequate monitoring and equipment. Ethical concerns, such as breaches of confidentiality, may occur,^{2,4} leading to increased complaints and dissatisfaction.^{12–14} HCPs report strain when caring for patients in hallways, citing limited space for assessments, compromised infection control, increased workload, and experiences of moral distress and burnout.^{2,4,5} These environments may negatively impact nursing retention and recruitment.^{2,15}

On general internal medicine (GIM) wards, patients have complex, chronic conditions, hallway bed use can be particularly challenging.¹⁶ To address capacity issues, hospitals have implemented overcapacity protocol (OCP) initiatives, designating specific hallway spaces for inpatient care.^{7,17–19} These protocols aim to manage volume while mitigating risks, but the impacts in GIM settings remain underexplored. This study aimed to evaluate the impact of a hallway bed initiative on GIM wards at a single Alberta hospital. Specifically, the study sought to: (1) assess the initiative’s effect on hallway bed utilization, patient complaints, and patient safety (PS) incidents; (2) characterize the patient population placed in hallway beds; and (3) understand the experiences and perceptions of GIM patients and HCPs receiving or delivering care in hallway spaces.

METHODS

Design, setting and participants

A convergent mixed methods study design was used, collecting quantitative and qualitative data. Collection and analysis occurred concurrently and were considered complementary to provide a holistic viewpoint.²⁰ The Good Reporting of a Mixed Methods Study guideline were followed.²¹ The study received

an ethical waiver from the University of Alberta Health Research Ethics Board (Pro00139264).

This study was conducted at a quaternary teaching hospital in Alberta, Canada. The hospital has 885 beds and provides a comprehensive range of services including transplant and interventional neurological and cardiac care.²² General internal medicine has the largest total number of adult inpatient beds within the hospital. There are six GIM wards, each with 20 beds, staffed by an interdisciplinary care team (nurses, allied health clinicians, GIM physicians, resident physicians, and medical students). In response to hospital-wide capacity challenges, the leadership team developed an OCP (in the mid-2000s) to manage patient movement during periods of high demand in the ED and inpatient wards. Historically, OCP stretcher beds were placed in between two ward beds or inconsistently in the ward hallway. However, since the COVID-19 pandemic, the demand for inpatient care significantly increased, requiring more frequent use of stretcher beds placed in ward hallways. In January 2023, the OCP was updated with a greater focus on hallway bed placement. The hallway bed initiative, using ward beds, structured process, included patient criteria to guide assignment by bed coordinators and nurses and directed hallway-bed use for emergency inpatients awaiting a ward bed and ward patients nearing discharge. The initiative was operational for over a year; favorable and unfavorable outcomes were anecdotally reported by frontline staff to senior management prompting an evaluation.

All adult patients (over the age of 18) placed in any of the six GIM ward hallway beds for any length of time were eligible to participate. Cognitively impaired and off-service GIM hallway bedded patients in any other medicine or surgical ward were excluded. All interdisciplinary HCPs (i.e., nurses, physicians, and allied health) who work on the GIM wards were eligible to participate.

Data sources and collection

Five data sources were collected from January 2023 to June 2024 (18-months), including: (1) hallway bed utilization data; (2) patient complaints; (3) patient safety incidents; (4) patient surveys and (5) HCPs surveys.

Retrospective data

Three data analysts (JV, TR, and DD) extracted de-identified data from various hospital and health organization IT systems into password-protected Excel documents ($n = 3$). Hallway bed utilization was extracted from the hospital electronic medical record

(EMR), included cumulative and monthly counts, with time point counts for use upon admission, mid-stay, and before discharge, as well repeated stays. Patient demographic data included gender, age, primary admission diagnosis, use of supplemental oxygen, isolation procedures, critical care orders, goals of care documentation, median length of stay (in hours and days), discharge level of care, and 30-day readmission. Patient safety incidents anonymously reported by HCPs were extracted from the health organization Reporting and Learning System (RLS); it included HCP verbatim comments, month of the reports, and ward and health organization safety category. Patient and family complaints data were obtained from the health organization Feedback and Concerns Tracking (FACT) system; it provided textual verbatim feedback of patient-reported complaints by month and hospital ward.

Prospective data

Purposive convenience sampling was used to collect feedback from patients and HCPs using a cross-sectional survey design including closed- and open-ended questions accompanied by a letter of information and consent form (Supplemental File 1). The patient survey was developed by the research team based on local context and reviewed by the health organization's patient engagement department. From February 26 to May 31, 2024, study team members (DM and IL) distributed paper surveys in person to patients assigned to hallway beds on the GIM wards. Patients completed the survey independently or with assistance; responses were recorded verbatim. Completed surveys were securely stored, digitized into a cloud-based form, and exported to a password-protected Excel file. Paper copies were then shredded. Thematic saturation (defined as the point which incoming data produce little or no new useful information relative to the study objectives) was used to determine sample size.²³

An HCP survey was developed using a cloud-based Forms and offered in both electronic and paper formats from February 20 to April 19, 2024. Paper surveys were placed at ward desks, while a poster with a QR code linked to the online version (Supplemental File 1). Participation was voluntary. A study team member (DM) collected paper responses weekly, which were later entered (JK) into the digital form and exported to Excel. All paper surveys were shredded post-entry. A target sample size of 136 was calculated based on an estimated 210 (35 per ward) eligible HCPs across the six GIM units.²⁴

Data analysis

Five separate Excel documents were analyzed. Data analysis of surveys occurred concurrently with data collection. Retrospective quantitative data and prospective survey responses were analyzed using Microsoft Excel (version 2013) performing descriptive statistical analyses (e.g., means, proportions). A qualitative descriptive design was used to analyze open-ended survey responses, applying thematic analysis to identify and describe key patterns and themes within the data.^{25,26} To enhance rigor and trustworthiness, two researchers independently coded the responses for each survey (DM and IL for the patient survey and DM and JK for the HCP survey). Coding discrepancies were resolved through consensus and discussion. A codebook (Supplemental File 2) was developed using an iterative process and finalized by consensus. To further ensure consistency and analytical rigour, a fifth researcher (PM) reviewed the codebook and finalized themes. Reflexivity was maintained throughout the analysis by encouraging researchers to reflect on their own assumptions, positionality, and potential biases during coding and interpretation.²¹ Regular team meetings were held to discuss emerging themes and interpretations, fostering transparency and collaborative validation of findings.

RESULTS

Hallway bed utilization data

A total of 913 hallway beds (monthly average of 53) were used among the six GIM wards, involving 824 (17%, 824/4918) unique patients from January 2023 to June 2024 (Table 1 and Table 2). Usage peaked in April (83 beds) and May 2023 (81 beds) (Figure 1). Most hallway beds (98%) were used mid-stay (493 instances) or nearing discharge (403 instances), with minimal use at admission (17 instances) and 35 patients experienced multiple hallway bed stays (Figure 2). The median hospital length of stay was 6 days, with hallway-based care approximately one day (median duration 18.5 to 21.7 hours). Most patients were male (57%), aged ≥ 65 years old (42%), and top six admission diagnoses (25%, 203/824) were sepsis, pneumonia, hyponatremia, cellulitis, congestive heart failure, and alcohol withdrawal. Few patients required supplemental oxygen ($n = 17$), isolation precautions ($n = 23$), or critical care consultation ($n = 3$) and 30-day readmission occurred in 32% (278/824) of patients.

Table 1: Hallway bed utilization (January 1, 2024 to June 25, 2024)

Variable	Hallway Beds	Patient
Total number (n = 6 GIM units)	913	824
Monthly median	53	49
Total number of admissions	N/A	4918
Phases of hospitalization* (frequency)		
Admission	17	17
Middle	493	459
Discharge	403	367
Multiple Phases	35	29
Phases of hospitalization (median length of stay in hours)		
Admission	21	
Middle	21.7	
Discharge	18.5	
Monthly median hospital length of stay		
Days	6	

*A single unique patient may experience hallway bed stays across multiple phases, resulting in a total count exceeding 824. Instances of hallway bed usage involving multiple phases within a single hospital visit occurred 35 times involving 29 unique patients. GIM-General Internal Medicine

Patient complaints

Patient complaint reports (n = 9) yielded five themes (Table 3): inadequate space and overcrowding, lack

Table 2: Hallway bed patient characteristics (January 1, 2024 to June 25, 2024)

Characteristic	Frequency (n = 824)	Percentage
Age group		
18–44 yr	201	24%
45–64 yr	275	34%
65–79 yr	237	29%
≥80 yr	111	13%
Male sex	472	57%
Top 6 Primary diagnosis	203	25%
Sepsis	60	7%
Pneumonia	50	6%
Hyponatremia	27	3%
Cellulitis	26	3%
Congestive heart failure	24	3%
Alcohol withdrawal	16	2%
Supplemental oxygen provided	17	2%
Isolation required (contact/droplet)	23	3%
Critical Care Consultation provided	3	0.3%
Readmission		
Within 5 days	113	13%
Within 30 days	278	32%

of privacy, confidentiality concerns, substandard professional conduct including lack of empathy, and bed location concern. A frequently cited issue (n = 5) was overcrowding, with patients describing cluttered and noisy environments hindering care delivery. One noted, “The hallway is not a big space for staff to maneuver and provide care,” while another reported having to “tough it out” despite being claustrophobic due to a lack of available beds. Several accounts described hallway care as distressing, one patient mentioned “waited in extreme pain ... for 12 hours.” A lack of privacy (n = 1) was linked to care occurring in high-traffic areas, with one patient stating, “No privacy or room for family ... and the area was a thoroughfare.” Another patient (n = 1) raised concerns about confidentiality, stating, “Nurses on the unit did not respect confidentiality, could hear them talking and doing report.” Substandard professional conduct and lack of empathy were noted in five reports one patient described their experience as “a terrible way to treat patients” and another calling for “non-judgmental care.” Four reports expressed distress over prolonged hallway bed placement, for some up to five days in a hallway bed, with one stating it “had a significant impact on the patient’s decline.”

Patient survey

Sixty patients were offered the survey and 55 consented to complete (Table 4). Patients were aged ≥60 years old (58%) and admitted for acute (51%) or chronic (29%) conditions. Hospital total length of stay

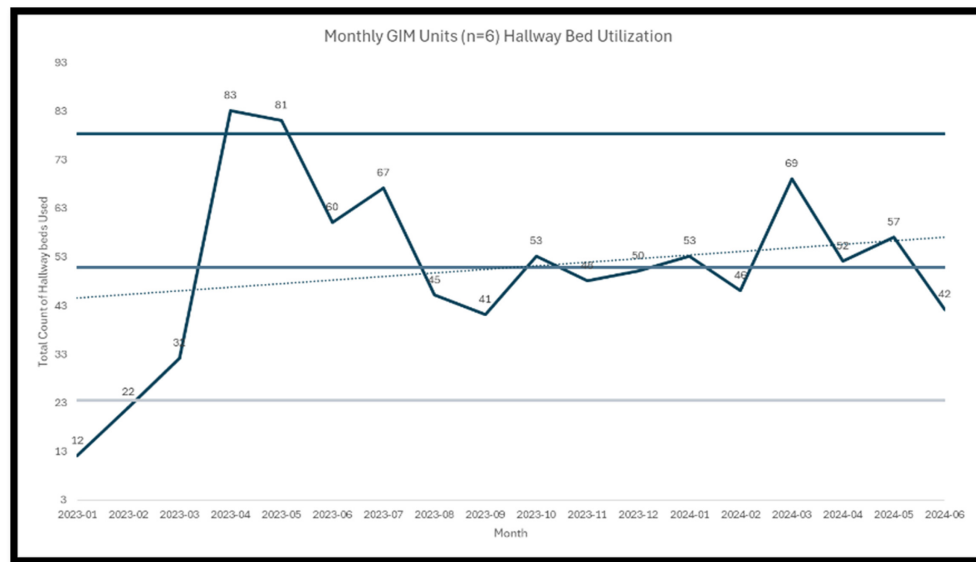


Figure 1: Monthly GIM units (6) hallway bed utilization for 18-month. The median monthly hallway bed usage was 53, with a range of 12 to 83. Peak usage was observed in April (83) and May 2023 (81). Additionally, a positive trending slope was illustrated

was five days or less (71%) and 65% indicated being in a hallway bed for three days or less. Although 60% of patients were informed about hallway bed placement, only 5% described their experience as comfortable; 64% reported worse comfort, and 31% were neutral. Five themes ($n = 5$) emerged from 362 open-ended responses to survey questions: (1) disruptive and

chaotic physical environment, (2) barriers to basic needs and resource access, (3) Compromised dignity, privacy, confidentiality, and psychological safety, (4) gratitude for care received, and (5) increased feelings of exposure and insecurity (Supplemental File 2).

Privacy concerns were raised by 58% of respondents, and 67% reported moderate noise and

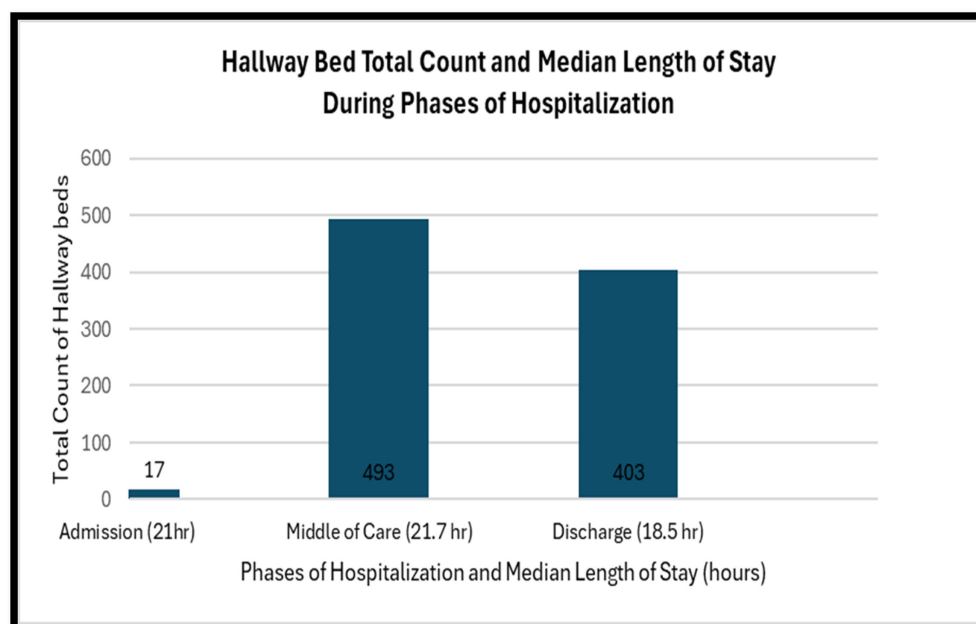


Figure 2: Hallway bed total count and median length of stay during phases of hospitalization. Nearly half of the hallway beds during the 18-month timeframe for the six general internal medicine units were used in the middle of the patient hospitalization. Prior to being transferred to a GIM unit bed, the patient spent a median of 21 to 21.7 hours in a hallway bed and 18.5 hours prior to hospital discharge

Table 3: Patient and family reported complaints (January 1, 2023 to June 30, 2024)

Feedback and Concerns Tracking (FACT) System (n = 9 reports submitted)		
Theme	Code and Sub-codes	Aligned Quotes
Inadequate space overcrowding	Environment Space, clutter, noisy (n = 5)	<i>The hallway is not a big space for staff to maneuver and provide care.</i> <i>Why aren't there enough beds for everyone. [patient] stated he is also claustrophobic...had to "tough it out."</i> <i>Patient waited in extreme pain in the hallway for 12 hours.</i> <i>Bed was next to a dirty utility room.</i> <i>Had to sleep in the hallway which was very noisy.</i>
Lack of privacy	Exposure People walking by/looking in (n = 1)	<i>No privacy or room for family ... and the area was a thoroughfare for patients, their families, as well as staff.</i>
Confidentiality concerns	Communication (discussing health information/overhearing conversation) (n = 1)	<i>Nurses on the unit did not respect confidentiality, could hear them talking and doing report.</i>
Substandard professional conduct and lack of empathy	Empathy and Compassion (n = 5)	<i>This is a terrible way to treat patients.</i> <i>Nurses did not provide professional, compassionate care.</i> <i>Does not believe the staff empathize with marginalized populations.</i> <i>Health care team on the unit failed to manage the pain.</i> <i>Would like the nursing staff to provide non-judgmental care and to practice the [Health organization] values.</i>
Bed location Concern	Environment Hallway bed location/ placement (n = 4)	<i>Concerned regarding bed located in hallway.</i> <i>Concerned about having been in a bed in the hallway for 3 days.</i> <i>Concern regarding [patient's] bed being in hallway for 5 days.</i> <i>The decision to place the patient in the hallway in her condition was inappropriate and is very upset and concerned it had a significant impact on the patients decline.</i>

disturbances affecting rest (Table 4). Resource access varied: 60% reported full access to essentials; 20%, partial access, and 62% noted missing resources, particularly bathroom access, call bells, and personal items. Patients expressed positive views of staff: 88% indicated staff were responsive, 78% were satisfied with communication, and 89% felt treated with dignity and respect. However, 16% described instances where dignity was compromised, citing communication breakdowns and lack of privacy or compassion. Although 74% received information about safety practices, 40% reported safety concerns. Overall, 81% rated their care 7 or higher on a 10-point scale. Suggestions for improvement included enhanced privacy

and comfort, better communication, improved access to essential resources, and clearer information about hallway care logistics.

Safety reports

Twelve HCP-reported PS incidents (Table 5) involving hallway placement and care were grouped into five organizational PS categories: (1) falls (n = 4), (2) general care management (n = 1), (3) unintended injury (n = 1), (4) environment (n = 2), and (5) transfer of care (n = 4). Falls were frequently reported, involving frail or high-risk patients: “Found patient on the floor in front of his wheelchair,” and “Patient walked to the bathroom ... a bang sound was

Table 4: Hallway bed patient survey (February 26, 2024 to May 31, 2024)

Question	Responses	Result (%)
1. Age	N = 55	58% ≥60 years old
2. Admission reason: acute or chronic	N = 55	51% acute and 29% chronic Disease
3. Hospital length of stay	N = 55	Range: <1 day to 2.5 months 71% stayed ≤5 days
4. Hallway bed length of stay	N = 55	Range: 1 day to >30 days 65% stayed ≤3 days
5. Hallway bed placement explained	N = 55	60% were informed
6. Comfort in hallway bed	N = 55 Total: 85 comments	64% worse comfort, 5% better comfort, 31% neutral 43 comments aligned to Environment code 4 Themes: 1. Disruptive and Chaotic Physical Environment 2. Barriers to Basic Needs and Resource Access 3. Compromised Dignity, Privacy, Confidentiality and Psychological Safety 4. Gratitude for Care Received
7. Privacy concerns in the hallway bed	N = 55 Total: 45 comments	58% reported privacy concerns 30 comments aligned to Exposure code Same themes as 1–3 above Additional Theme: 5. Increased Feelings of Exposure and Insecurity
8. Noise and disturbances	N = 55	67% indicated moderate noise/disturbances affecting rest
9. Comments about noise disturbances	N = 32 Total: 36 comments	20 comments aligned to noise code 3 sub-codes: Lighting, Noise and Bed Location Theme: Disruptive and Chaotic Physical Environment
10. Access to essential resources (call button, bathroom, etc.)	N = 55	60% had access and 20% had partial access
11. Lacking resources	N = 55 Total: 47 comments	62% felt resources were lacking 35 comments, 19: bathroom access, 5: call bell, 11 personal items (cigarettes, sleeping mask)
12. Staff responsiveness/attentiveness	N = 53	88% indicated staff responsive
13. Communication of treatment plan	N = 55	78% were satisfied with communication.
14. Treated with dignity and respect	N = 54	89% felt treated with dignity and respect
15. Instances where dignity was compromised?	N = 9 Total: 10 comments	16 % felt dignity was compromised 3 Themes: Communication breakdown, Lack of Privacy, and Perceived Lack of Empathy and Compassion
16. Information about safety practices	N = 55	74% received safety information
17. Safety concerns	N = 52	40% reported safety concerns
18. Overall satisfaction with care	N = 52	81% rated 7 or above (Scale 1–10)
19. Challenges of hallway bed placement	N = 55 Total: 53 comments	56% (31/55) mentioned challenges Same 4 themes as question 6
20. Suggestions for improvement	N = 36 Total: 56 comments	3 Themes: 1: Enhancing Privacy and Environmental Comfort (curtains, reduce lighting/noise); 2: Improving Space and Bed Placement; 3: Improved Communication and Resource Accessibility (bathroom, bedside table)
21. Additional Recommendations	N = 25 Total: 30 comments	Same themes as Question 20. Additional theme: 4. Clear Communication About Bed and Bathroom Arrangements

Table 5: Healthcare provider hallway bed patient safety incident report summary

Report Category (n = 12)	Aligned Quotes
Fall (n = 4)	<i>Unwitnessed fall ... found patient on the floor in front of his wheelchair. [patient] is extremely weak, having edema to legs, and weeping wounds ... started sliding down the bed onto the floor.</i> <i>No fall sounds heard by staff.</i> <i>Hallway patient walked to the bathroom ... A bang sound was heard by staff ... patient does not remember falling.</i>
General Care Management (n = 1)	<i>Nursing and medicine[physician] independently indicated that the hallway placement would be unsafe ... The patient profoundly weak at admission and formally noted to be a significant falls risk ... Neither nursing, medicine nor allied health were consulted about the bed placement.</i>
Unintended Injury (n = 1)	<i>Linen cart hit a table that then hit the patient's injured knee, hanging off the bed.</i>
Environment (n = 2)	<i>Patient was admitted from ER into a hallway space. Heavy 2-person patient assist. Falls risk, aspiration risk ... required O2 during the day. Aspirated during the night, developed cardiac abnormalities.</i> <i>Patient in hallway stretcher. Patient is bariatric, requires 2-person assist to reposition and to assess the wound ... inadequate space in the stretcher for patient reposition (patient comfort and to adequately offload the sacral wound to promote healing) and inadequate space for staff to assist with repositioning (workplace safety concern).</i>
Transfer of Care (n = 4)	<i>Emergency patient was brought up to unit even though patient was not a candidate to be hallway patient.</i> <i>Emergency patient sent to unit has left leg weakness/paralysis due to stroke 10 years ago. Patient had to be slide onto the stretcher.</i> <i>Noticed that medication had not been given. It was realized that no nurse had assumed care of this hallway patient.</i> <i>Emergency patient sent to the unit is confused, high falls and aspiration risk, on a 2-point soft restraint, COVID positive, and on insulin drip.</i>

heard ... patient does not remember falling.” One report (n = 1) highlighted lack of interdisciplinary input for hallway placement despite known risks: “Neither nursing, medicine nor allied health were consulted ... the patient was profoundly weak and a significant falls risk.” An unintended injury was reported when “a linen cart hit a table that then hit the patient’s injured knee.” Environmental limitations compromised both patient safety and staff function, particularly for bariatric patients: “Inadequate space in the stretcher to offload a sacral wound” and “aspirated during the night ... developed cardiac abnormalities.” Transfer of care incidents revealed communication and oversight failures: “Medication had not been given ... no nurse had assumed care” and “Emergency patient sent to unit is confused, high falls and aspiration risk, on insulin drip and COVID positive.”

HCP Survey

A total of 140 HCPs completed the survey (Table 6) with the majority being nurses (68%) and physicians

(23%). Most respondents (62%) indicated admission as the primary phase for hallway bed use. While 86% believed the initiative negatively impacted safety, 69% felt patients assigned to hallway beds were inappropriate. Over half (52%) rated communication poorly, and only 45% consistently received advance notice of hallway assignments. Key concerns included inadequate staffing (66%), limited resources (77%), compromised privacy (79%), restricted family access (87%), and increased interactions with distressed patients and families (90%). Additionally, 75% expressed dissatisfaction with the updated OCP.

Ten themes emerged from 781 open-ended responses: (1) Inadequate access to necessary resources, (2) Discontinue hallway bed use, (3) Improve patient selection criteria and safety protocols, (4) Environmental and space limitations, (5) Ensure privacy and confidentiality, (6) Care delivery concerns, (7) Compromised dignity and well-being, (8) Disruptive and chaotic physical environment, (9) Negative patient experiences, and (10) Staff morale weakened (Sup-

Table 6: Hallway bed healthcare provider survey (February 20, 2024 to April 19, 2024)

Question	Response	Result (%)
1. Health care provider role	N = 140	68% nurse, 23% physician, 9% allied health
2. Unit most often working on	N = 140	Unit 1-40; Unit 2-51, Unit 3-50, Unit 4-48, Unit 5-37, Unit 6-39. All units represented
3. Experience with hallway bed patients	N = 140	100% Yes
4. Hallway bed phase of hospitalization	N = 140	62% Admission 11% middle of their stay 3% before discharge 24% multiple phases
5. Patient placed in a hallway bed were appropriate	N = 138	69% disagree, 21% neutral, 10% agree
6. Communication among care team members about hallway bed placement	N = 135	52% indicated poor, 27% indicated fair, 21% good
7. Advanced notification of hallway bed patient placement	N = 137	45% always, 30% never, 25% sometimes
8. Hallway bed impact patient safety	N = 140	86% negatively, 11% neutral, 3% positively
9. Safety measure or protocol required for hallway bed use	N = 123 Comments	5 Themes*: 1, 2, 3, 4, and 5
10. Impact of hallway bed placement on patient comfort and safety	N = 130 Comments	7 Themes*: 1, 2, 3, 6, 7, 8, and 9
11. Impact of hallway bed placement on workflow/efficiency in delivering patient care	N = 126 Comments	8 Themes*: 1, 2, 3, 4, 7, 8, 9, and 10
12. Challenges when providing care	N = 130 Comments	8 Themes*: 1, 2, 3, 6, 7, 8, 9, 10
13. Adequate staffing	N = 139	66% not enough staff, 22% enough staff
14. Adequate resources and equipment	N = 139	77% not enough, 15% enough
15. Impacted communicating medical information respecting privacy and confidentiality	N = 138	79% agree, hallway bed placement negatively impacts communication with patient, 11% disagree, and 10% unsure
16. Limited ability for family/friends to visit and provide support	N = 140	87% agree, 6% disagree, and 7% unsure
17. Increased interactions with frustrated patients/families	N = 140	90% agree and 5% disagree
18. Impact ability to perform patient care tasks	N = 91 comments	9 Themes*: 2, 3, 5, 6, 7, 8, 9, and 10
19. Protocol/process satisfaction	N = 138	75% not satisfied, 12% somewhat satisfied, and 13% very satisfied
20. Use of Report Learning System (Report safety incident)	N = 138 N = 65 comments	54% no and 46% yes If no, top 3 reasons were no time, nothing to report, and unsure how to report
21. What improvements or changes would you recommend to enhance the overall experience of providing care to patients in hallway beds?	N = 116 Comments	7 Improvement Themes: 1. Enhance Privacy and Environmental Comfort (curtains, reduce lighting/noise); 2. Improve Space and Physical Bed Placement; 3. Improve Resource Accessibility (bathroom, bedside table); 4. Provide

Table 6: Continued

Question	Response	Result (%)
		Clear Communication About Bed and Bathroom Arrangements; 5. Improve the hallway bed criteria and protocol; 6. Improve nursing staff; 7. Discontinue Hallway bed use

**Themes from textual comments: 1. Access to resources/equipment to provide standard of care to patients; 2. Discontinue hallway bed placement; 3. Improve Hallway bed criteria (patient selection, safety and Infection control guidelines); 4. Environmental improvement; 5. Ensure Privacy and Confidentiality; 6. Care delivery concerns; 7. Compromised Patient Dignity, Privacy and Well-being; 8. Disruptive and Chaotic Physical Environment; 9. Negative patient experience; 10. Staff morale weakened*

plemental File 2). HCPs recommended improving privacy, communication, resources, and staffing levels, revising the patient selection criteria and protocol, determining an alternate location/space within the hospital, and eliminating the use of hallway beds when possible.

Data Integration

Similar concerns were identified from patient and HCP data sources such as inadequate access to resources, compromised privacy and confidentiality, and the disruptive care environment in crowded hallways. Both patient complaints and HCP-reported PS incident reports highlighted risks such as falls, injuries, and the overall unsuitability of hallway spaces for care. Notable differences in perspectives emerged, with patients expressing appreciation for receiving care even in ward hallways rather than in the emergency department, whereas HCPs emphasized the detrimental impact on staff morale and the urgent need for improved protocols and staffing models. Further, a significant discrepancy identified was the timing of hallway bed use, with utilization data indicating beds used were primarily mid-stay and near discharge, whereas HCPs reported frequent use at ward admission.

Comparing all data sources together, seven (n = 7) key recommendations emerged: (1) Enhance privacy and environmental comfort, (2) Improve physical layout and bed placement decision making process, (3) Increase accessibility to essential resources, (4) Provide clear communication with patients, (5) Revise hallway bed protocols, (6) Optimize staffing with defined roles and responsibilities to support patient hospital movement, and (7) Discontinue the use of hallway beds. Implementing these recommendations may require stricter patient placement criteria and protocol (clarifying bed placement decisions [upon admission, mid-stay, or nearing discharge] and discrepancies among bed coordinators and nurs-

ing), targeted infrastructure investments, application of technology (artificial intelligence) for demand forecasting, clearly defined staffing strategies to ensure patient dignity and privacy as well support the well-being of patients and health care providers.

DISCUSSION

Explanation of findings

This study evaluated a hospital hallway bed initiative across six GIM wards over 18 months, revealing operational, clinical, and experiential challenges associated with hallway medicine. The use of 913 hallway beds, primarily mid-stay and near discharge, with a median stay of less than a day, highlights the strain on ward flow and the need for continuous patient turnover to meet rising care demands. Hallway bed use, once a contingency, has become a systemic response to overcrowding.^{2,3} Notably, a disconnect emerged between utilization patterns and HCP perceptions. Hallway beds were predominantly used mid-stay; HCPs perceived usage upon admission. This discrepancy may suggest gaps in communication, visibility of patient flow, and clarity of bed assignment criteria, underscoring the need for greater transparency among bed coordinators and clinical teams, along with data-informed decision-making for patient placement. High turnover rates, rapid bed cleans, and multiple patient transfers further increase clinical risk and operational burden.²⁷ Based on the findings, to improve efficiency, a proactive bed management protocol is needed involving daily identification of one or two discharge-ready patients by the clinical team, and transitioning them to hallway beds in a safe, structured, communicative manner.

Patient and HCP identified shared concerns regarding hallway care, including compromised privacy, limited access to resources, and a chaotic physical environment. Over half of patients reported moderate

to significant noise, inadequate access to bathrooms and call bells, and feelings of exposure and insecurity. While many patients expressed gratitude for the care received, these conditions challenge core principles of patient-centred care.^{5,28} Physical layout improvements, such as better access to bathrooms and strategic bed placement, could enhance privacy and reduce exposure, while supporting staff access. The HCP survey reflected the perspectives of clinical staff on GIM wards, with most respondents being nurses, followed by physicians and allied health professionals. These respondents reported negative impacts on safety, communication, staff morale, and care quality. Dissatisfaction with the updated OCP and frequent pleas for the discontinuation of hallway medicine suggest growing concern and burnout among front-line staff.^{2,5,29} Thematic analysis of HCP feedback highlighted the need to repair patient flow processes and re-evaluate the ethical acceptability of hallway medicine in GIM settings.⁵ Clear patient selection criteria, targeting cognitively stable, non-acute, and functionally independent patients nearing discharge are essential. Ongoing monitoring of patient and HCP experience is critical for quality improvement.

Ensuring adequate staffing levels may reduce delays, support equitable care access, and mitigate provider burnout. Patient complaints and HCP-reported safety incidents underscore the clinical risks posed by hallway care. Incidents involving falls,³⁰ injury from equipment, and communication failures during transfers of care illustrate how physical and operational limitations may directly translate into harm. Importantly, most hallway patients had relatively low acuity, suggesting intentional triaging of lower-risk individuals and compliance with the hallway initiative patient selection criteria. Approximately, 32% had 30-day readmissions which may indicate a negative impact on post-discharge outcomes or reflect unmet care needs during hospitalization.^{2,19,31} In contrast, the Canadian Institute for Health Information (CIHI) reported a 13.3% rate for 30-day readmission to inpatient acute care for medical patients.³² Further investigation is required to verify whether the reason for readmission was related to the initial admission and characterize patient and care delivery factors which may contribute to the higher 30-day readmissions rate observed among hallway placed medical patients in this study.

Future directions

Seven key recommendations emerged from data integration, including improving privacy and com-

fort, refining hallway bed placement, enhancing resource accessibility, and strengthening communication and staffing. Many align with both patient and HCP feedback, highlighting the need for interdisciplinary collaboration in developing humane, sustainable solutions.² A common recommendation was to discontinue hallway bed use altogether, reflecting broad consensus on inadequacy for delivering dignified care.^{2,3,5} Addressing these issues will require institutional commitment. Infrastructure investment, revised OCP, standardized patient selection, and clear staff roles may reduce inconsistencies. Predictive technologies and staffing models accounting for hallway-based care are also critical. Artificial intelligence-driven tools piloted in Canadian health systems have shown promise in forecasting inpatient occupancy and identifying patients nearing discharge, enabling proactive, efficient use of resources and reducing hallway bed reliance.^{33,34} When integrated into overcapacity protocols, these tools may support timely interventions and strategic use of available beds while helping preserve patient safety, privacy and dignity.

Limitations

This study was conducted in a single hospital which may limit generalizability. The possibility of response and volunteer/participant bias was reduced by triangulation of multiple data sources which strengthened the validity of the findings.³⁵ In summarizing the textual findings, some of the nuance and specificity may have been lost when grouped into themes.²⁶ To mitigate this a codebook was developed; the research team met often to ensure transparent theme development and collaborative validation. Patient outcomes such as long-term readmission and mortality were not analyzed,³¹ limiting conclusions about clinical impacts.

CONCLUSION

Hallway beds on GIM wards serve as an interim solution during hospital capacity strain but raise important concerns from both patients and health-care providers. These findings underscore the need for immediate operational improvements and long-term, system-level strategies to reduce reliance on hallway-based care. As the Canadian health care system faces ongoing strain and an aging medically complex population, future capacity initiatives should prioritize infrastructure investment, integration of predictive technologies, optimized staffing models,

and interprofessional policy and process development to uphold patient dignity and health care provider well-being.

ACKNOWLEDGEMENTS

The authors wish to acknowledge the patients and health care providers who generously shared their experiences and insights, which were essential to this study.

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ETHICS APPROVAL

The study received an ethical waiver from the University of Alberta Health Research Ethics Board (Pro00139264) on February 7, 2024.

INFORMED CONSENT

N/A

REGISTRY AND THE REGISTRATION NO. OF THE STUDY/TRIAL

N/A

DATA ACCESSIBILITY

N/A

FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

DISCLOSURES

There are no competing interests to disclose, financial or otherwise, for the other authors involved.

PEER REVIEW

This article has been peer reviewed.

ANIMAL STUDIES

N/A

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