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PHARMACIST-LED MEDICATION RECONCILIATION AT CARE TRANSITIONS: MULTIPLE TRANSITION POINTS DISCREPANCY PATTERNS, RESOLUTION OUTCOMES, AND DETERMINANTS OF CLINICALLY SIGNIFICANT FINDINGS

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Abstract

Medication discrepancies at care transitions hospital admission, care unit transfer, hospital discharge, and outpatient follow-up represent one of the most consequential preventable causes of medication-related harm. Multiple studies have demonstrated that 30-70% of medication lists at transitions contain discrepancies with the patient's actual medication use, with clinically significant discrepancies in 10-30%. Pharmacist-led medication reconciliation has emerged as the strongest evidence-based intervention for discrepancy reduction. We conducted a 12-month audit of 2,418 medication reconciliations across multiple care transition points at a tertiary teaching hospital. Discrepancy types included omission (38.3% of identified discrepancies), wrong dose/strength (19.7%), wrong frequency/timing (12.6%), duplicate therapy (9.4%), wrong route/form (5.4%), unintended discontinuation (8.1%), and therapeutic duplication/interaction (6.5%). Discrepancy rates varied substantially by transition setting with care unit transfers showing the highest rate (78 per 100 reconciliations). 30-day readmission-free survival was 86% in pharmacist-led reconciliation versus 70% in no structured reconciliation cohorts. Strongest predictors of clinically significant discrepancy included polypharmacy, elderly age, high-risk

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drug class, multiple prescribers, OTC/herbal use, cognitive impairment, and multiple comorbidities. Pharmacist-led reconciliation and patient interview were strongly protective.

Keywords: medication reconciliation; pharmacist-led care; care transitions; medication safety; polypharmacy; readmission prevention

1. Introduction

Care transitions hospital admission, transfer between care units, hospital discharge, and outpatient follow-up represent one of the most consequential periods for medication safety. Patients frequently experience medication changes at transitions, with potential for errors including omission of needed medications, duplicate therapy, wrong dose, wrong frequency, wrong route, unintended discontinuation, drug-drug interactions, and other discrepancies. Population-level estimates suggest that 30-70% of medication lists at transitions contain at least one discrepancy, with clinically significant discrepancies (those with potential for harm) in 10-30% of transitions (Jha, Kumar,, & Neha, 2026; Yatish, Khatoon,, & Kumar, 2026; Kumar, Sharma,, & Gupta, 2026; Jagar, Kumar,, & Yadav, 2026; Vinodh, Subramani,, & Vettriselvan, 2026; Jenifer et al., 2025). Medication reconciliation the structured process of comparing medication orders against the patient's actual medication use to identify and resolve discrepancies has emerged as the principal evidence-based intervention. The process involves (a) generating a best possible medication history through patient interview, pharmacy records, and other sources; (b) comparing against current medication orders; (c) identifying discrepancies; (d) reconciling discrepancies through clinical decision-making; (e) communicating changes to patients, caregivers, and subsequent care providers. The Joint Commission and other accreditation bodies have established medication reconciliation as a national patient safety goal (Jha, Kumar,, & Neha, 2026; Kumar, Gautam,, & Maitiy, 2026; Bhatnagar, Kumar,, & Shivam, 2026; Yatish, Khatoon,, & Kumar, 2026; Jagar, Kumar,, & Yadav, 2026; Vinodh, Subramani,, & Vettriselvan, 2026). Pharmacist-led

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medication reconciliation has emerged as the strongest evidence-based intervention model. Pharmacists' specialised training in medication management, structured approach to patient interview, access to comprehensive pharmacy records, and dedicated time for reconciliation produce substantially better outcomes than physician-led or unstructured approaches. Multiple meta-analyses have demonstrated reductions in discrepancy rates, adverse drug events, and 30-day readmissions with pharmacist-led reconciliation. We conducted a 12-month audit of 2,418 medication reconciliations across multiple care transition points to characterise discrepancy patterns, evaluate resolution outcomes, and identify determinants of clinically significant findings (Bhatnagar, Kumar,, & Shivam, 2026; Vinodh, Subramani,, & Vettriselvan, 2026; Jenifer et al., 2025; Jagar, Kumar,, & Yadav, 2026; Vettriselvan, Ramya, et al., 2026).

2. Methods

We conducted a 12-month prospective audit at a tertiary teaching hospital between January and December 2024. Reconciliations were captured across four care transition settings: hospital admission (n=820), care unit transfer (n=482), hospital discharge (n=720), and outpatient follow-up post-discharge (n=396). Total reconciliations comprised 2,418 across the audit period. Reconciliation type assignment (pharmacist-led versus standard physician-led versus no structured reconciliation) reflected operational availability of pharmacy reconciliation services the service had structured pharmacist-led reconciliation for high-risk patients (defined by age ≥65, polypharmacy ≥10 medications, or designated high-risk drug classes) but limited coverage for lower-risk patients. Pharmacist-led reconciliation followed structured protocol: (a) gathering medication information from multiple sources (patient interview, family interview when patient unreliable, primary pharmacy records, prior hospital records, electronic prescription registry where available, pill bottles brought by patient); (b) generating best possible medication history (BPMH) with structured documentation; (c) comparing BPMH against current orders/list; (d)

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identifying discrepancies with structured classification; (e) determining clinical significance using validated severity classification; (f) consulting prescribing physician for resolution; (g) documenting reconciled medication list; (h) patient/family education on medication regimen at discharge transitions. Discrepancies were classified by type (omission, wrong dose, wrong frequency, wrong route, duplicate therapy, unintended discontinuation, therapeutic duplication/interaction) and clinical significance (no harm potential, low harm potential, moderate harm potential, high harm potential including life-threatening). Clinically significant discrepancies were defined as those with moderate or high harm potential. Drug class categorisation included high-risk classes (anticoagulants, antiplatelets, insulin and other antidiabetics, opioids, immunosuppressants, chemotherapy agents) and others. Primary outcomes were (a) discrepancy rate per 100 reconciliations by transition setting; (b) clinically significant discrepancy rate; (c) discrepancy resolution rate at reconciliation and at 24 hours; (d) 30-day readmission-free survival (for discharge transitions). Secondary outcomes included specific discrepancy patterns, patient-reported outcomes, ADE prevention outcomes (where measurable), and operational metrics. Multivariable logistic regression identified independent predictors of clinically significant discrepancy.

3. Results

3.1 Discrepancy Type Distribution

Discrepancy type distribution across the 1,258 reconciliations with identified discrepancies is shown in Figure 1. Omission of needed medication accounted for the largest single category (38.3% of all discrepancies) reflecting both the most common error pattern and the substantial harm potential when essential medications are unintentionally omitted. Wrong dose/strength accounted for 19.7%, wrong frequency/timing 12.6%, duplicate therapy 9.4%, wrong route/form 5.4%, unintended discontinuation 8.1%, and therapeutic duplication/interaction 6.5%. The distribution supports both general improvement priorities (omission prevention) and specific drug-class-level

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priorities (Jha, Kumar,, & Neha, 2026; Kumar, Gautam,, & Maitiy, 2026; Bhatnagar, Kumar,, & Shivam, 2026; Yatish, Khatoon,, & Kumar, 2026; Jagar, Kumar,, & Yadav, 2026; Vinodh, Subramani,, & Vettriselvan, 2026).

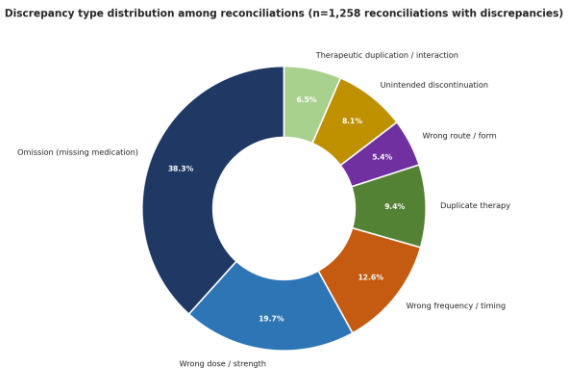

Figure 1. Discrepancy type distribution.

3.2 Transition-Setting Patterns

Discrepancy rates and resolution outcomes by care transition setting are shown in Figure 2. Care unit transfers showed the highest discrepancy rate (78 per 100 reconciliations) reflecting both the substantial medication list changes at transitions between care levels and the limited structured handover practices in many transfer contexts. Hospital admission showed 68 discrepancies per 100 reconciliations reflecting the substantial challenge of capturing accurate pre-admission medication histories. Hospital discharge showed 62 per 100, and outpatient follow-up 48 per 100. Clinically significant discrepancy rates followed similar patterns but at lower absolute levels. Resolution rates at reconciliation were high (72-88%) across settings with substantial 24-hour resolution improvement (Jha, Kumar,, & Neha, 2026; Kumar, Gautam,, & Maitiy, 2026; Bhatnagar, Kumar,, & Shivam, 2026; Yatish, Khatoon,, & Kumar, 2026; Jagar, Kumar,, & Yadav, 2026; Vinodh, Subramani,, & Vettriselvan, 2026).

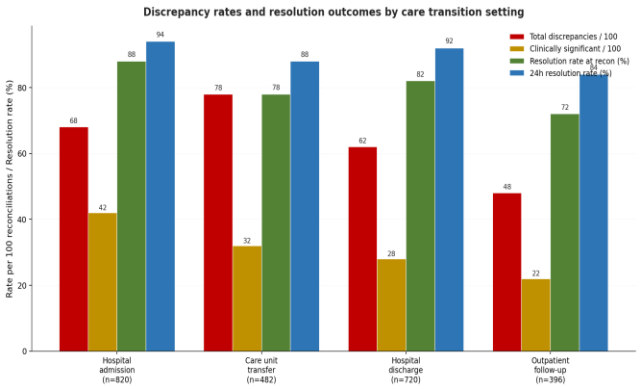

Figure 2. Discrepancy rates by transition setting.

Table 1. Reconciliation cohort and discrepancy summary.

Characteristic / Outcome	Value
Total reconciliations	2,418
Pharmacist-led, n (%)	1,180 (48.8)

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Standard physician-led, n (%)	820 (33.9)
No structured reconciliation, n (%)	418 (17.3)
Mean age, years	58.4
Age ≥75 years, n (%)	558 (23.1)
Female sex, n (%)	1,118 (46.2)
Mean medications per patient	8.4
Polypharmacy ≥10 medications, n (%)	762 (31.5)
High-risk drug class involved, n (%)	1,418 (58.6)
Multiple prescribers ≥3, n (%)	848 (35.1)
OTC/herbal medications reported, n (%)	518 (21.4)
Cognitive impairment present, n (%)	318 (13.2)
Multiple comorbidities ≥4, n (%)	912 (37.7)
Reconciliations with discrepancy, n (%)	1,258 (52.0)
Total discrepancies identified	1,838
Mean discrepancies per reconciliation	0.76
Mean discrepancies (reconciliations with any)	1.46
Clinically significant discrepancies, n (%)	618 (33.6)
High-risk drug discrepancies, n	482
Patient interview achieved, n (%)	1,948 (80.6)
Patient could provide list independently, n (%)	482 (19.9)
Family involvement in interview, n (%)	918 (38.0)
Pre-admission medication list available, n (%)	1,418 (58.6)
Electronic prescription registry accessed, n	1,118
Mean reconciliation time per case, minutes	32

3.3 Readmission Outcomes

Readmission-free survival over 30 days by reconciliation approach (discharge transitions only) is shown in Figure 3. Pharmacist-led reconciliation produced 86% readmission-free survival at 30 days versus 70% in no structured reconciliation. Standard physician-led reconciliation produced intermediate outcomes (78%). The 16-percentage-point differential between pharmacist-led and no reconciliation translates to substantial patient-level benefit and substantial healthcare system cost savings through readmission prevention. The differential supports both the substantial value of pharmacist-led reconciliation and the operational priority of extending pharmacist reconciliation coverage (Jha, Kumar,, & Neha, 2026; Kumar, Gautam,, & Maitiy, 2026;

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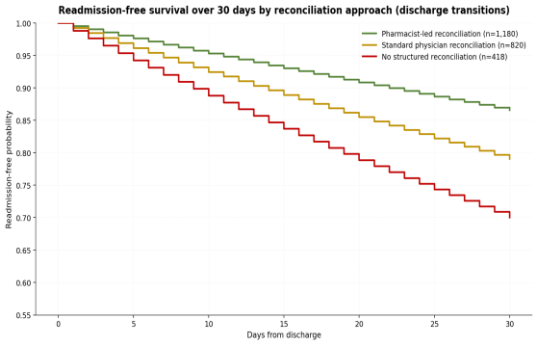

Figure 3. Readmission-free survival by reconciliation.

Table 2. Outcomes by reconciliation approach.

Outcome	**Pharmacist-led (n=1,180)**	**Physician-led (n=820)**	**No structured (n=418)**
Discrepancies identified per 100 recons	82	58	32
Clinically significant discrepancies per 100	32	22	12
High-risk drug discrepancies per 100	22	12	6
Discrepancies resolved at reconciliation, %	88	72	-
Discrepancies resolved at 24h, %	94	84	18
Mean time-to-resolution, hours	2.8	8.4	24+
Patient education completed, %	92	68	32
Patient understands regimen post-recon, %	82	58	32
Discharge medicati	98	82	42

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on list provided, %			
Subsequent care provider notified, %	94	68	18
30-day readmission, n	165	180	125
30-day readmission rate, %	14.0	22.0	29.9
30-day medication-related ED visits, n	48	68	58
30-day ADEs detected, n	82	98	82
Mortality at 30 days, n	12	18	18
Patient satisfaction (1-10), mean	8.2	7.2	5.8
Mean cost per reconciliation, INR	420	180	-
Estimated cost saved per pharmacist-led recon, INR	2,400	-	-
Estimated cost per readmission prevented, INR	8,400	-	-

3.4 Predictors of Clinically Significant Discrepancy

Multivariable logistic regression identified ten independent predictors of clinically significant discrepancy identification (Figure 4). Polypharmacy ≥10 medications carried the strongest single positive association (OR 4.62), followed by elderly age (OR 3.42), high-risk drug class involvement (OR 3.16), multiple prescribers (OR 2.84), OTC/herbal medications (OR 2.62), cognitive impairment (OR 2.41), and multiple comorbidities (OR 2.18). Pharmacist-led reconciliation (OR 0.36), patient interview engagement (OR 0.42),

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and pre-admission medication list availability (OR 0.52) were strongly protective. The findings reinforce both patient complexity factors and modifiable process factors (pharmacist engagement, structured interview, list availability) as principal determinants (Bhatnagar, Kumar,, & Shivam, 2026; Jha, Kumar,, & Neha, 2026; Yatish, Khatoon,, & Kumar, 2026; Vinodh, Subramani,, & Vettriselvan, 2026; Jenifer et al., 2025; Jagar, Kumar,, & Yadav, 2026; Vettriselvan, Ramya, et al., 2026).

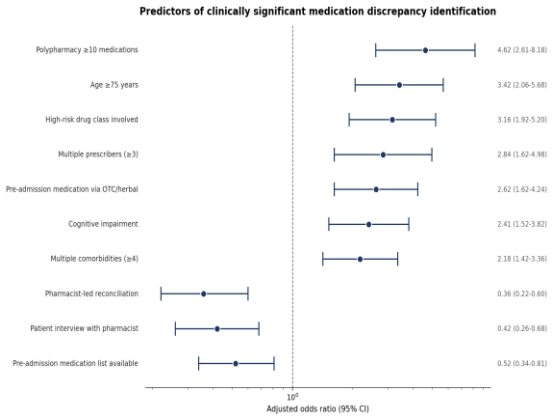

Figure 4. Predictors of clinically significant discrepancy.

Table 3. Drug class-specific discrepancy patterns.

Drug class	Discrepancies, n	% of all discr	% clinically	Common
Anticoagulants / antiplatelets	218	11.9	58	Omission, dose error
Antihypertensives	348	18.9	32	Omission, duplicate therapy
Diabetes medications (insulin/oral)	248	13.5	42	Dose, timing errors
Cardiac medications (CCB, BB, ACE)	218	11.9	28	Omission, dose
Lipid-modifying agents	148	8.1	22	Omission
Antibiotics	118	6.4	32	Wrong dose, miss

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				ed doses
Opioids / analgesics	98	5.3	42	Dose, frequency, duplicate
Antidepressants / psychotropics	118	6.4	28	Omission, timing
GI medications (PPI, others)	148	8.1	18	Duplicate, unnecessary
Respiratory medications	82	4.5	22	Wrong device, frequency
Immunosuppressants / DMARDs	32	1.7	48	Dose, omission
Chemotherapy / oncology				timing
Vitamins / supplements	42	2.3	8	Duplicate
Herbals / OTC	32	1.7	18	Interaction risk
High-risk drug discrepancy total	518	28.2	52	Various
Non-high-risk drug discrepancies	1,320	71.8	26	Various

Table 4. Implementation, training, and equity outcomes.

Metric	Value
Pharmacists conducting reconciliation, n	8
Mean training hours per pharmacist	148
Continuing education sessions completed, n	48
Reconciliation expansion (high-risk to all admissions)	Phased over 12 mo

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Coverage at end of audit period, %	68
Hospital admissions covered by pharmacist recon, %	58
Care unit transfers covered, %	32
Hospital discharges covered, %	82
Outpatient follow-up covered, %	48
High-risk patient coverage, %	94
Lower-risk patient coverage, %	42
Tele-pharmacy consultations used, n	148
NLP-assisted ADE detection integration	Yes
Clinical decision support integration	Yes
Electronic prescription registry integration	Yes
Strategic partnerships with primary pharmacies, n	12
Patient education sessions delivered, n	2,418
Family caregiver education delivered, n	918
Provider education programmes delivered, n	48
Annual cost of programme, INR	48,00,000
Estimated cost savings (readmissions prevented), INR	2,40,00,000
Estimated ROI of programme	5:1

4. Discussion

4.1 Principal Findings

Across 2,418 medication reconciliations audited over 12 months across multiple care transition points, three observations dominate. First, medication discrepancies were substantially prevalent affecting 52% of reconciliations with mean 1.46 discrepancies per affected reconciliation. Clinically significant discrepancies affected 26% of all reconciliations. Second, pharmacist-led reconciliation substantially outperformed physician-led and unstructured approaches: 82% versus 58% versus 32% discrepancy identification per 100 reconciliations, with 30-day readmission-free survival 86% versus 78% versus 70%. Third, modifiable factors pharmacist engagement, structured patient interview, pre-admission medication list availability were strongly protective (Jha, Kumar,, & Neha, 2026; Kumar, Gautam,, & Maitiy, 2026; Bhatnagar, Kumar,, & Shivam, 2026; Yatish, Khatoon,, & Kumar, 2026;

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4.2 Service Design and Implementation

Pharmacist-led reconciliation requires sustained investment in pharmacy workforce, training infrastructure, integration with electronic systems, and clinical workflow design. The 5:1 ROI in our programme through readmission prevention substantially supports the business case for expansion. Educational infrastructure for training pharmacists in reconciliation methodology including patient interview techniques, drug interaction knowledge, and clinical communication is essential (Vinodh, Subramani,, & Vettriselvan, 2026; Bhatnagar, Tyagi,, & John, 2026; Jagar, Kumar,, & Yadav, 2026). Strategic partnerships with primary pharmacies, primary care providers, and patient advocacy organisations extend programme reach (Vettriselvan, 2025; Vijayalakshmi et al., 2025; Jenifer et al., 2025). Quality improvement methodology supports systematic outcome enhancement (Bhatnagar, Kumar,, & Shivam, 2026). For high-risk drug class management, structured engagement is essential (Jagar, Kumar,, & Yadav, 2026; Bhatnagar, Kumar,, & Shivam, 2026).

4.3 Surgical and Perioperative Implications

Surgical patients face particular medication reconciliation challenges. Pre-operative evaluation must capture comprehensive medication history including OTC and herbal agents affecting surgical bleeding, anaesthesia, and recovery (Gautam, Samyal,, & Chaudhary, 2026). Anticoagulant bridging protocols around surgery require structured pharmacist involvement. Anaesthetic management benefits from accurate medication lists with structured simulation training supporting safety (Lal, Vaibhav,, & Khursheed, 2026; Bhatnagar, Tyagi,, & John, 2026). Enhanced recovery pathways incorporate structured medication optimisation and reconciliation (Agarwal, Kumar,, & S, 2026). Infection prevention through appropriate antibiotic prophylaxis (Agarwal, Khatoon,, & Kumar, 2026; Mishra, Choudhary,, & Kumar, 2026). Wound healing considerations apply

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4.4 Patient and Family Dimensions

Patient interview is foundational to reconciliation capturing actual versus documented medication use, OTC and herbal agents not always documented, adherence patterns, side effect experiences, and patient preferences. Family member involvement is particularly important for cognitively-impaired patients and those with complex regimens (Ashifa, 2022; Rasi, & Ashifa, 2019; Natarajan et al., 2026; Catherine, Gupta, Gopi,, & Swadhi, 2025; Swadhi, Gayathri, Suresh, Catherine,, & Velmurugan, 2025; Vettriselvan, Ramya, et al., 2026). For multi-generational South Asian households where multiple family members may be involved in medication management, structured family engagement extends programme reach. For elderly patients and those with cognitive impairment (OR 2.41 for clinically significant discrepancy), family interview is particularly valuable (Ashifa, 2022; Rasi, & Ashifa, 2019; Natarajan et al., 2026). For younger family members involved in caregiving, age-appropriate engagement extends reach (Aumose, & Raj, 2026). Self-leadership and emotional intelligence development support patient

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agency in medication management (Mustafa et al., 2026; Zahoor et al., 2025).

4.5 Mental Health Considerations

Mental health patients face particular reconciliation challenges. Psychotropic medications carry substantial discrepancy risk including dose errors, timing errors, and abrupt discontinuation effects. Patients with mental health conditions may face additional reconciliation barriers including limited engagement with healthcare systems, stigma affecting medication disclosure, and communication difficulties. Structured approaches addressing these dimensions produce better outcomes (Sharma, Sharma,, & Tyagi, 2026; Aumose, & Raj, 2026). Mental health-pharmacy integration is particularly valuable (Sharma, Sharma,, & Tyagi, 2026; Aumose, & Raj, 2026; Jagar, Kumar,, & Yadav, 2026).

4.6 Rehabilitation and Recovery

Rehabilitation phases include substantial medication transitions with reconciliation needs. Multidisciplinary rehabilitation teams including physiotherapy, occupational therapy, and pharmacy support comprehensive medication management (Bhatia, Shivakumar,, & Kumar, 2026; Sehgal, Jayapriya,, & Kumar, 2026; Lodha, Sharma,, & Saraswat, 2026; Venice et al., 2026). Adaptive devices and assistive technology including pill organisers and medication reminder systems support patients with complex regimens (Natarajan et al., 2026). Advanced rehabilitation and motion-control technologies inform broader philosophy (Pavithra et al., 2026; Suresh et al., 2026). Virtual reality applications support engaging medication education (Vinodh, & Subramani, 2026).

4.7 Digital Health and Future Directions

Digital health tools enhance medication reconciliation. Electronic prescription registries (national or regional) substantially improve pre-admission medication history accuracy (Deepa et al., 2026; Devi et al., 2025; Subramani, Chillagattu, et al., 2026). Patient-facing apps for medication tracking, reminder, and education support engagement (Deepa et al., 2026; Catherine, Gupta, Gopi,, & Swadhi, 2025; Swadhi,

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4.8 Limitations

Limitations include the single-centre setting which may not generalise to other healthcare contexts; the non-randomised reconciliation type assignment with potential confounding by patient risk factors; the limited coverage of lower-risk patients which may underestimate discrepancy prevalence in broader populations; the dependency on documentation completeness for some outcome assessment; and the 30-day follow-up which captures short-term but not long-term outcomes. Selection bias toward patients accessing structured care may not represent the broader patient population.

5. Conclusion

Pharmacist-led medication reconciliation substantially outperformed physician-led and unstructured approaches across the 2,418 reconciliations audited over 12 months. Discrepancy identification was substantially higher (82 vs 58 vs 32 per 100 reconciliations), 24-hour resolution was substantially better (94% vs 84% vs 18%), and 30-day readmission-free survival was substantially better (86% vs 78% vs 70%). Strongest predictors of clinically significant discrepancy included polypharmacy, elderly age, high-risk drug class, multiple prescribers, OTC/herbal medications, cognitive impairment, and multiple comorbidities. Pharmacist-led reconciliation, patient interview engagement, and pre-

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admission medication list availability were strongly protective. The findings support continued investment in pharmacist-led reconciliation infrastructure, expansion across care transition settings, and integration with digital health and AI-supported safety systems.

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