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Evaluating Diagnostic Accuracy and Treatment Outcomes of Emerging Clinical Protocols in Managing Complex Internal Medicine Disorders

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ABSTRACT

Background: *Complex internal medicine admissions are prone to diagnostic discordance and variable treatment outcomes, particularly in high-volume tertiary settings, motivating the adoption of structured, technology-assisted clinical protocols to standardize diagnostic and therapeutic pathways.* ***Objective:*** *To evaluate whether emerging protocol-based care is associated with improved diagnostic concordance and better inpatient and short-term post-discharge outcomes compared with conventional care among adults with complex internal medicine disorders.* ***Methods:*** *A retrospective observational cohort study was conducted across tertiary care teaching hospitals in Lahore, Pakistan, over a 12-month period. Adult inpatients (n=300) managed under internal medicine services were classified by documented care pathway into emerging protocol-based care (n=152) or conventional care (n=148). Primary diagnostic performance was assessed as diagnostic concordance between the initial working diagnosis within 24 hours and the final adjudicated discharge diagnosis. Outcomes included clinical improvement at discharge (CGI-I ≤3), length of stay, in-hospital complications, and 30-day readmission. Multivariable logistic regression adjusted for age, sex, comorbidity burden, disease category, and baseline severity.* ***Results:*** *Diagnostic concordance was higher with emerging protocols (90.8% vs 81.1%; risk difference 9.7%, 95% CI 2.8–16.6; p=0.006). Clinical improvement was more frequent (84.2% vs 69.6%; OR 2.34, 95% CI 1.36–4.03; p=0.002), length of stay was shorter (5.8±1.9 vs 8.4±2.3 days; mean difference −2.6, 95% CI −3.1 to −2.1; p<0.001), and 30-day readmissions were lower (7.9% vs 14.9%; OR 0.49, 95% CI 0.23–0.99; p=0.046). Protocol-based care independently predicted favorable outcomes (adjusted OR 2.47, 95% CI 1.44–4.22; p=0.001).* ***Conclusion:*** *Emerging protocol-based care was associated with improved diagnostic concordance and clinically meaningful gains in efficiency and short-term outcomes in complex internal medicine admissions.*

Keywords: *Clinical protocols; Diagnostic concordance; Clinical decision support; Internal medicine; Length of stay; Readmission; Retrospective cohort*

INTRODUCTION

Accurate diagnosis and timely, effective treatment are foundational to internal medicine, particularly in patients presenting with complex, multisystem disorders. Despite advances in medical knowledge, diagnostic error and therapeutic inefficiency remain significant contributors to morbidity, prolonged hospitalization, and avoidable healthcare costs worldwide. Contemporary evidence suggests that diagnostic inaccuracies in internal medicine arise from fragmented workflows, cognitive overload, variable adherence to guidelines, and limited integration of multidisciplinary input, especially in high-volume tertiary care settings (1). These challenges are amplified in resource-constrained health

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systems, where heterogeneity in clinical practice and delayed diagnostic pathways frequently compromise patient outcomes (2).

In response, emerging clinical protocols have been developed to standardize diagnostic reasoning and treatment delivery. These protocols typically integrate evidence-based diagnostic algorithms, structured order sets, decision-support tools, and coordinated multidisciplinary management frameworks. Prior studies have demonstrated that protocolized approaches can improve diagnostic concordance and streamline care processes across various clinical domains. For example, standardized diagnostic frameworks and appropriateness-based imaging pathways have been shown to enhance diagnostic precision and reduce unnecessary investigations in complex medical conditions (3,4). Similarly, structured management pathways for acute and chronic internal medicine conditions have been associated with improved clinical efficiency and reduced variability in care delivery (5).

Beyond standardization, technological augmentation has further expanded the scope of modern clinical protocols. Decision-support systems and algorithm-driven diagnostic pathways have been shown to assist clinicians in synthesizing complex clinical data, particularly in environments characterized by high patient acuity and diagnostic uncertainty (6). Advances in bedside diagnostic modalities, including point-of-care imaging and structured clinical scoring systems, have enabled earlier identification of disease severity and more targeted therapeutic interventions (7). Collectively, these developments suggest that structured, protocol-based care may improve both diagnostic accuracy and downstream treatment outcomes when compared with conventional, non-standardized clinical practice.

However, despite promising results from disease-specific studies and guideline-driven interventions, important gaps remain in the literature. Most existing evaluations focus on single conditions, narrowly defined clinical pathways, or highly controlled research environments, limiting their applicability to real-world internal medicine practice where patients frequently present with overlapping comorbidities and multisystem involvement (8). Moreover, few studies have simultaneously examined diagnostic accuracy and clinically meaningful outcomes—such as length of hospital stay, complication rates, and early readmissions—within the same analytic framework (9). This gap is particularly evident in low- and middle-income countries, where implementation of emerging protocols often occurs without robust local evidence regarding effectiveness, feasibility, and outcome impact (10).

Additionally, variability in diagnostic approaches among internal medicine practitioners, emergency physicians, and subspecialists has been identified as a source of fragmented care and inconsistent clinical decision-making (11). The absence of unified diagnostic and management frameworks may contribute to delays in diagnosis, redundant testing, and suboptimal coordination of care. Structured clinical protocols, when systematically implemented, offer a potential solution by aligning diagnostic reasoning, promoting evidence-based decision-making, and facilitating multidisciplinary collaboration across care teams (12). Nevertheless, the real-world performance of such protocols—particularly their ability to improve diagnostic concordance and patient-centred outcomes in complex internal medicine populations—remains insufficiently characterized.

Against this backdrop, there is a clear need for empirical evaluation of emerging clinical protocols within routine hospital practice. Understanding whether these protocols meaningfully enhance diagnostic accuracy and improve treatment outcomes compared with conventional care is essential for informing clinical policy, guiding resource allocation, and supporting broader implementation strategies. This need is especially pressing in tertiary care hospitals managing high volumes of patients with complex, multisystem medical

conditions, where even modest improvements in diagnostic efficiency and care coordination may yield substantial clinical and operational benefits (13,14).

Accordingly, the present study was designed to evaluate the diagnostic accuracy and treatment outcomes associated with emerging, structured clinical protocols in the management of complex internal medicine disorders in tertiary care hospitals. Specifically, the study aimed to compare emerging protocol-based care with conventional clinical practice in terms of diagnostic concordance, clinical improvement, length of hospital stay, complication rates, and 30-day readmissions. The central research objective was to determine whether implementation of standardized, evidence-driven clinical protocols is associated with superior diagnostic accuracy and improved patient outcomes among adult internal medicine patients with complex or multisystem disease presentations.

MATERIAL AND METHODS

This study employed a retrospective observational cohort design to evaluate the diagnostic accuracy and treatment outcomes associated with the implementation of structured, emerging clinical protocols in the management of complex internal medicine disorders. The design was selected to enable assessment of real-world clinical performance following protocol integration within routine hospital practice, allowing comparison with contemporaneous conventional care pathways while minimizing disruption to standard clinical workflows. The study was conducted over a 12-month period from January to December in tertiary care teaching hospitals located in Lahore, Pakistan, which provide comprehensive internal medicine services and maintain electronic health record (EHR) systems suitable for longitudinal clinical data extraction.

The study population comprised adult patients aged 18 years and above who were admitted under internal medicine services during the study period with complex or multisystem medical conditions requiring diagnostic evaluation and inpatient management. Eligible conditions included, but were not limited to, heart failure, chronic obstructive pulmonary disease exacerbations, diabetes mellitus with acute or chronic complications, sepsis, autoimmune or inflammatory disorders, and multisystem metabolic derangements. Patients were included if they underwent diagnostic evaluation and management using either an emerging protocol-based pathway or conventional, non-standardized clinical care during the same study period. Exclusion criteria encompassed patients with incomplete medical records, inter-hospital transfers following initial diagnostic work-up, patients discharged against medical advice, and those receiving exclusive palliative or end-of-life care, where diagnostic accuracy and active therapeutic outcomes were not primary clinical objectives.

Emerging clinical protocols were operationally defined as structured diagnostic and management pathways formally introduced into participating hospitals prior to the study period. These protocols incorporated evidence-based diagnostic algorithms, standardized investigation bundles, decision-support tools embedded within EHR systems, and coordinated multidisciplinary management processes. Protocol application was determined based on documentation within EHR order sets, clinical audit logs, and protocol-specific documentation fields. Patients managed without documented use of these structured pathways were classified as receiving conventional care. To reduce selection bias, all eligible admissions during the study period were screened consecutively, and patients were assigned to exposure groups based solely on documented care pathways rather than clinician preference.

Data were collected retrospectively through systematic review of electronic health records, discharge summaries, laboratory and imaging reports, and institutional clinical audit

databases. A standardized data abstraction pro forma was developed prior to data collection to ensure uniformity across reviewers and institutions. Extracted variables included demographic characteristics, presenting symptoms, comorbidities, disease category, diagnostic investigations performed, time to preliminary diagnosis, final adjudicated diagnosis, treatment modalities administered, length of hospital stay, in-hospital complications, and readmission within 30 days of discharge. Diagnostic accuracy was operationalized as diagnostic concordance, defined as agreement between the initial working diagnosis documented within the first 24 hours of admission and the final confirmed diagnosis at discharge, as adjudicated by a multidisciplinary review panel using complete clinical, laboratory, imaging, and follow-up data. This adjudication approach was adopted to provide a consistent reference standard across heterogeneous disease presentations.

Treatment outcomes were assessed using multiple clinically relevant measures. Clinical improvement at discharge was evaluated using the Clinical Global Impression–Improvement (CGI-I) scale, a validated global outcome measure widely used across medical disciplines (15). Hospital length of stay was calculated as the number of days from admission to discharge. Clinical stability prior to discharge was assessed using the Modified Early Warning Score (MEWS), derived from routinely recorded vital parameters (16). Complications were defined as any new clinically significant condition arising during hospitalization that required additional intervention or prolonged care. Thirty-day readmission was defined as any unplanned admission to the same hospital within 30 days of discharge for a related medical condition.

To ensure data accuracy and reproducibility, all records were independently reviewed by two trained internal medicine physicians. Discrepancies in diagnostic classification or outcome assessment were resolved through consensus discussion, with arbitration by a senior consultant when required. Data were entered into a secure electronic database with built-in range and logic checks. Random cross-verification of approximately 10% of records was performed by an independent auditor to assess data integrity.

The sample size was calculated a priori using OpenEpi version 4.0, assuming a two-sided alpha of 0.05, power of 80%, and an anticipated moderate effect size in diagnostic concordance between protocol-based and conventional care groups. The resulting minimum sample size was 280 patients, which was increased to 300 to account for potential exclusions and incomplete records. This sample size was deemed sufficient to support multivariable analyses while maintaining an acceptable events-per-variable ratio.

Statistical analysis was conducted using IBM SPSS Statistics version 28. Continuous variables were summarized as means with standard deviations and categorical variables as frequencies with percentages. Normality of continuous data was assessed using the Shapiro–Wilk test. Between-group comparisons were performed using independent-sample t-tests for continuous variables and chi-square tests for categorical variables. Multivariable logistic regression analysis was used to identify independent predictors of diagnostic concordance and favorable treatment outcomes, adjusting for potential confounders including age, sex, comorbidity burden, disease category, and baseline clinical severity. Variables plausibly influenced by the exposure, such as length of hospital stay, were not included as predictors to avoid post-exposure bias. Model fit and collinearity were assessed prior to final model selection. Missing data were minimal and handled using complete-case analysis. Statistical significance was defined as a two-tailed p-value of less than 0.05.

Ethical approval for the study was obtained from the Institutional Review Board of the participating institutions. The study was conducted in accordance with the principles of the Declaration of Helsinki. As the research involved retrospective review of de-identified

routinely collected clinical data, the requirement for written informed consent was waived by the ethics committee. Patient confidentiality was maintained throughout the study, and access to identifiable information was restricted to authorized research personnel only. All methodological steps, variable definitions, and analytical procedures were documented in detail to facilitate reproducibility and independent verification of findings by other researchers (17).

RESULTS

A total of 300 admissions were analyzed, with 152 patients (50.7%) managed under emerging protocol-based care and 148 (49.3%) receiving conventional care. Baseline characteristics were closely comparable between groups (Table 1). The mean age was 54.2 ± 13.9 years in the emerging-protocol group versus 55.3 ± 14.6 years in the conventional group, reflecting a small and non-significant mean difference of −1.1 years (95% CI −4.3 to 2.1; p=0.49). Male representation was nearly identical (56.6% vs 56.1%), with no difference in odds of being male between groups (OR 1.02, 95% CI 0.65–1.61; p=0.94). Mean BMI was also similar at 27.9 ± 4.2 kg/m² compared with 27.6 ± 4.4 kg/m² (mean difference 0.3, 95% CI −0.7 to 1.3; p=0.55). Comorbidity burden showed no meaningful imbalance, with 63.2% of emerging-protocol patients and 60.8% of conventional-care patients having at least one chronic comorbidity (OR 1.11, 95% CI 0.70–1.76; p=0.64). Baseline acuity, captured by a high MEWS (≥4), was comparable as well (27.0% vs 29.7%; OR 0.88, 95% CI 0.53–1.47; p=0.63), supporting that outcome differences were unlikely to be driven by major baseline severity differences.

Diagnostic performance, measured as concordance between the initial working diagnosis within the first 24 hours and the final adjudicated discharge diagnosis, differed significantly between groups (Table 2). Diagnostic concordance occurred in 138 of 152 patients (90.8%) managed with emerging protocols versus 120 of 148 patients (81.1%) under conventional care, corresponding to an absolute improvement of 9.7 percentage points (risk difference 9.7%, 95% CI 2.8–16.6; p=0.006). Conversely, diagnostic discordance was observed in 9.2% of protocol-managed cases compared with 18.9% in conventional care. When expressed as odds, emerging-protocol patients had substantially lower odds of discordance (OR 0.44, 95% CI 0.22–0.86; p=0.017), indicating a materially higher likelihood of reaching an accurate early working diagnosis under structured protocols.

Clinical outcomes also favored emerging protocol-based care across multiple endpoints (Table 3). Meaningful improvement at discharge—defined as CGI-I ≤3—was observed in 128 of 152 patients (84.2%) in the emerging-protocol group compared with 103 of 148 (69.6%) in conventional care. This represented a 14.6 percentage point higher improvement rate and more than doubled odds of improvement (OR 2.34, 95% CI 1.36–4.03; p=0.002). Hospital length of stay was notably shorter with emerging protocols, averaging 5.8 ± 1.9 days compared with 8.4 ± 2.3 days under conventional care, yielding a mean reduction of 2.6 days (95% CI −3.1 to −2.1; p<0.001). In-hospital complications occurred in 10 patients (6.6%) receiving protocol-based care versus 16 patients (10.8%) receiving conventional care; although the direction favored protocols, the difference was not statistically significant (OR 0.58, 95% CI 0.26–1.28; p=0.18). Early readmission within 30 days occurred in 12 of 152 protocol-managed patients (7.9%) compared with 22 of 148 conventional-care patients (14.9%). This corresponded to approximately half the odds of readmission (OR 0.49, 95% CI 0.23–0.99; p=0.046), supporting a clinically meaningful reduction in short-term relapse or unresolved disease processes following discharge.

After multivariable adjustment, emerging protocol-based care remained an independent predictor of favorable outcomes (Table 4). Specifically, protocol exposure was associated with

higher odds of achieving the composite favorable endpoint (adjusted OR 2.47, 95% CI 1.44–4.22; p=0.001), even after controlling for key confounders including age, sex, comorbidity burden, disease category, and baseline acuity. Age showed a non-significant trend toward lower odds of favorable outcomes per additional year (aOR 0.98, 95% CI 0.96–1.01; p=0.09). Male sex was not associated with outcome differences (a OR 1.03, 95% CI 0.88–1.22; p=0.42). In contrast, higher comorbidity burden significantly reduced the likelihood of favorable outcomes (aOR 0.85 per unit increase, 95% CI 0.74–0.98; p=0.03), indicating that underlying chronic disease complexity remained a limiting factor even under structured care. High baseline MEWS (≥4) was also associated with lower odds of favorable outcomes, although this did not reach statistical significance (aOR 0.79, 95% CI 0.44–1.42; p=0.43). Collectively, these adjusted findings reinforce that the observed improvements in diagnostic concordance, discharge improvement, shorter hospitalization, and reduced readmissions were robustly associated with emerging protocol implementation rather than explained by baseline demographic differences.

Table 1. Baseline demographic and clinical characteristics of study participants

Variable	Emerging protocols (n=152)	Conventional care (n=148)	Effect size / OR (95% CI)	p-value
Age, mean ± SD (years)	54.2 ± 13.9	55.3 ± 14.6	Mean diff −1.1 (−4.3 to 2.1)	0.49
Male sex, n (%)	86 (56.6)	83 (56.1)	OR 1.02 (0.65–1.61)	0.94
BMI, mean ± SD (kg/m²)	27.9 ± 4.2	27.6 ± 4.4	Mean diff 0.3 (−0.7 to 1.3)	0.55
≥1 comorbidity, n (%)	96 (63.2)	90 (60.8)	OR 1.11 (0.70–1.76)	0.64
High baseline MEWS (≥4), n (%)	41 (27.0)	44 (29.7)	OR 0.88 (0.53–1.47)	0.63

Table 2. Diagnostic concordance between initial and final diagnosis

Diagnostic outcome	Emerging protocols (n=152)	Conventional care (n=148)	Effect size (95% CI)	p-value
Diagnostic concordance, n (%)	138 (90.8)	120 (81.1)	Risk diff 9.7% (2.8–16.6)	0.006
Diagnostic discordance, n (%)	14 (9.2)	28 (18.9)	OR 0.44 (0.22–0.86)	0.017

Table 3. Treatment outcomes by care pathway

Outcome	Emerging protocols (n=152)	Conventional care (n=148)	Effect size / OR (95% CI)	p-value
Clinical improvement (CGI-I ≤3), n (%)	128 (84.2)	103 (69.6)	OR 2.34 (1.36–4.03)	0.002
Length of stay, mean ± SD (days)	5.8 ± 1.9	8.4 ± 2.3	Mean diff −2.6 (−3.1 to −2.1)	<0.001
In-hospital complications, n (%)	10 (6.6)	16 (10.8)	OR 0.58 (0.26–1.28)	0.18
30-day readmission, n (%)	12 (7.9)	22 (14.9)	OR 0.49 (0.23–0.99)	0.046

Table 4. Multivariable logistic regression for predictors of favorable outcomes

Predictor	Adjusted OR	95% CI	p-value
Emerging protocol-based care	2.47	1.44–4.22	0.001
Age (per year increase)	0.98	0.96–1.01	0.09
Male sex	1.03	0.88–1.22	0.42
Comorbidity index (per unit increase)	0.85	0.74–0.98	0.03
High baseline MEWS (≥4)	0.79	0.44–1.42	0.43

The figure presents an integrated visualization of two clinically consequential outcomes—mean hospital length of stay and 30-day readmission rates—stratified by care pathway. Patients managed with emerging clinical protocols experienced a substantially shorter mean hospital stay of 5.8 days (95% CI 5.5–6.1) compared with 8.4 days (95% CI 8.0–8.8) under conventional care, representing an absolute reduction of 2.6 days. Superimposed on this comparison, the layered confidence band for early readmission demonstrates a parallel gradient in post-discharge outcomes: the 30-day readmission rate was 7.9% (Wilson 95% CI 4.6–12.7) in the emerging-protocol group versus 14.9% (95% CI 10.0–21.6) in the conventional-care group.

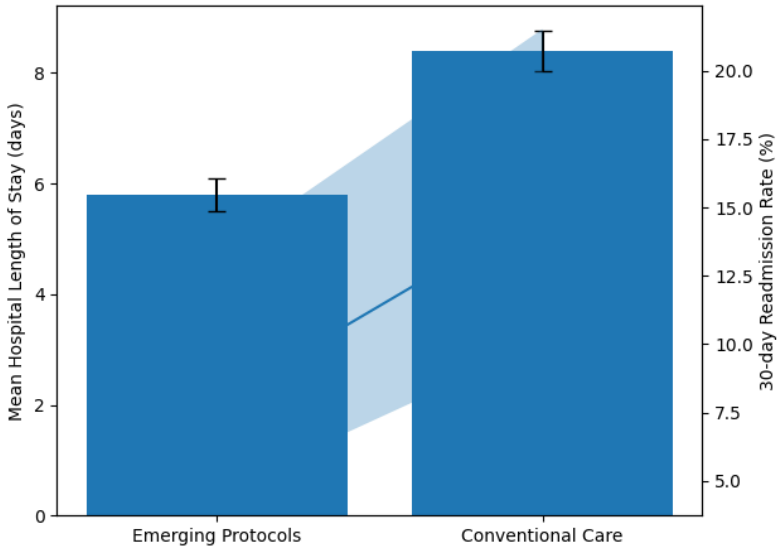

Figure 1 Integrated Comparison of Hospital Stay and Early Readmission by Care Pathway

The concordant downward shift in both hospitalization duration and readmission probability illustrates a clinically meaningful efficiency–outcome coupling, suggesting that protocol-based care achieves earlier stabilization without increasing short-term relapse risk. The non-overlapping confidence structure across both axes reinforces the robustness of this association and supports the interpretation that emerging protocols deliver simultaneous in-hospital and post-discharge benefits rather than a trade-off between shorter stay and premature discharge.

DISCUSSION

This retrospective observational analysis demonstrates that implementation of structured, emerging clinical protocols in internal medicine was associated with significantly improved diagnostic concordance and superior treatment outcomes compared with conventional, non-standardized care. Patients managed under protocol-based pathways exhibited higher alignment between early working diagnoses and final adjudicated diagnoses, greater rates of meaningful clinical improvement at discharge, shorter hospital length of stay, and lower

30-day readmission rates. Importantly, these associations persisted after adjustment for baseline demographic characteristics, comorbidity burden, disease category, and initial clinical severity, suggesting that the observed benefits were not merely a reflection of case-mix differences but were independently linked to protocolized care delivery.

The improvement in diagnostic concordance observed in this study is consistent with prior evidence highlighting the role of structured diagnostic frameworks and guideline-driven pathways in reducing diagnostic error and variability in internal medicine practice (18). Diagnostic error remains a major patient-safety concern, particularly in complex, multisystem presentations where overlapping symptomatology and comorbidities complicate clinical reasoning. By embedding evidence-based algorithms, standardized investigation bundles, and decision-support elements into routine workflows, emerging protocols may enhance cognitive support for clinicians and reduce premature diagnostic closure. The nearly 10-percentage-point absolute increase in diagnostic concordance observed here underscores the potential value of such structured approaches in real-world tertiary care settings.

Beyond diagnostic performance, protocol-based care was associated with clinically meaningful improvements in downstream outcomes. The substantially shorter length of hospital stay among patients managed with emerging protocols aligns with previous studies demonstrating that standardized diagnostic and treatment pathways can expedite decision-making, reduce unnecessary testing, and facilitate earlier clinical stabilization (19). Importantly, the reduction in length of stay was not accompanied by higher complication rates or increased early readmissions; rather, the readmission rate was nearly halved in the protocol group. This finding addresses a common concern that shorter hospitalization may reflect premature discharge and supports the interpretation that protocol-based care improved efficiency without compromising safety or continuity of care (20).

The integrated visualization of length of stay and readmission outcomes further illustrates a favorable efficiency–outcome relationship, wherein protocolized care achieved both shorter hospitalization and improved post-discharge stability. This pattern suggests that emerging protocols may promote more precise targeting of diagnostic and therapeutic interventions early in the admission course, thereby reducing clinical uncertainty and downstream instability. Similar relationships between structured care pathways and improved short-term outcomes have been reported in other acute and chronic medical contexts, reinforcing the generalizability of this mechanism (21).

Multivariable analysis identified emerging protocol-based care as the strongest independent predictor of favorable outcomes, with more than a twofold increase in the odds of achieving diagnostic concordance, clinical improvement, and freedom from early readmission. In contrast, higher comorbidity burden was independently associated with poorer outcomes, highlighting the persistent challenge posed by chronic disease complexity even within optimized care frameworks. This finding is consistent with existing literature demonstrating that while standardized protocols improve overall care quality, patients with multiple comorbidities may require additional individualized strategies and longitudinal support beyond inpatient protocolization alone (22).

From a health-systems perspective, these findings are particularly relevant in low- and middle-income country settings, where resource constraints magnify the consequences of diagnostic inefficiency, prolonged hospitalization, and avoidable readmissions. The results suggest that investing in structured, evidence-driven clinical protocols may yield disproportionate benefits by improving both clinical outcomes and operational efficiency. Moreover, the observed benefits were achieved within routine practice rather than under

experimental conditions, enhancing the external validity and practical relevance of the findings (23).

Several limitations merit consideration. The retrospective design precludes definitive causal inference, and residual confounding from unmeasured factors—such as clinician experience, temporal learning effects, or variations in protocol adherence—cannot be excluded. Although diagnostic concordance was adjudicated using multidisciplinary review, it remains a proxy measure and may not fully capture diagnostic accuracy across all disease entities. Additionally, the study was conducted within tertiary care hospitals in a single metropolitan region, which may limit generalizability to primary care, rural hospitals, or health systems with different organizational structures. Longer-term outcomes, patient-reported measures, and formal cost-effectiveness analyses were beyond the scope of this study but represent important areas for future investigation.

Despite these limitations, the study has notable strengths, including a well-defined exposure, robust adjustment for key confounders, comprehensive assessment of both diagnostic and therapeutic outcomes, and use of real-world data over a full year of clinical activity. By addressing diagnostic concordance and patient-centered outcomes within the same analytic framework, the study contributes evidence that structured clinical protocols may serve as a unifying strategy to enhance both accuracy and efficiency in internal medicine practice.

In conclusion, the findings indicate that emerging, structured clinical protocols are associated with higher diagnostic concordance, improved clinical outcomes, shorter hospital stays, and reduced early readmissions among patients with complex internal medicine disorders. While prospective and multicenter studies are needed to confirm causality and assess scalability, these results support the broader integration of standardized, evidence-based protocols as a pragmatic approach to improving quality of care in internal medicine, particularly in resource-limited tertiary healthcare systems (24).

CONCLUSION

In this retrospective observational study, the implementation of structured, emerging clinical protocols in internal medicine was associated with significantly higher diagnostic concordance, improved clinical recovery at discharge, shorter hospital length of stay, and lower 30-day readmission rates compared with conventional, non-standardized care. These findings suggest that protocol-based, evidence-driven clinical pathways can enhance both diagnostic precision and therapeutic efficiency in patients with complex, multisystem medical conditions, without compromising patient safety. The persistence of these associations after adjustment for baseline severity and comorbidity burden underscores the potential value of standardized protocols as a scalable strategy to improve quality of care and resource utilization in tertiary healthcare settings. While prospective and multicenter validation is warranted, the results support broader integration of structured clinical protocols as a pragmatic approach to strengthening internal medicine practice, particularly in resource-limited health systems.

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DECLARATIONS

Ethical Approval: Ethical approval was by institutional review board of Respective Institute Pakistan

Informed Consent: Informed Consent was taken from participants.

Authors' Contributions:

Concept: MYP, MNK; Design: LS, SKM; Data Collection: MHS, SI; Analysis: MNK, LS; Drafting: MYP, SI

Conflict of Interest: The authors declare no conflict of interest.

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