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Evaluation of Delays in Diagnosis and Management of Acute Admissions: A Multidisciplinary Clinical Audit Involving eye, internal Medicine, Surgery, Radiology

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ABSTRACT
Timely diagnosis and management of acute hospital admissions are critical determinants of patient outcomes, yet delays remain prevalent due to complex multidisciplinary workflows. This clinical audit evaluated delays across ophthalmology, internal medicine, surgery, and radiology services in acute admissions, with particular emphasis on eye-related emergencies and imaging-dependent decision-making. The objective was to quantify diagnostic and management delays, identify specialty-specific bottlenecks, and assess compliance with institutional and international time-based standards. A prospective audit was conducted over six months, analyzing time intervals from presentation to diagnosis, imaging, specialist review, and definitive management. Results demonstrated statistically significant delays in ophthalmology-related acute admissions, particularly in retinal emergencies and acute vision loss, largely attributable to delayed imaging and specialist referral. Radiology turnaround times significantly influenced downstream clinical decisions across all specialties, with after-hours imaging delays showing the strongest association with prolonged length of stay (p < 0.001). Internal medicine and surgical pathways exhibited moderate delays, primarily during interdepartmental referrals. This audit provides novel, specialty-stratified evidence highlighting radiology-dependent delays as a central determinant of acute care inefficiency and underscores the need for integrated, protocol-driven multidisciplinary pathways to improve acute admission outcomes.
Keywords: Clinical audit, Acute admissions, Diagnostic delay, Ophthalmology emergencies, Radiology turnaround time

INTRODUCTION

Acute hospital admissions represent a critical interface between emergency care and definitive inpatient management, where timeliness of diagnosis and intervention directly influences morbidity, functional outcomes, and healthcare resource utilization. Delays in the diagnostic and therapeutic continuum have been consistently associated with adverse clinical consequences, prolonged hospitalization, increased costs, and diminished patient satisfaction. As healthcare systems grow increasingly complex, multidisciplinary coordination has emerged as a central determinant of efficiency in acute care delivery [1-3].

The diagnostic process in acute admissions frequently involves multiple specialties operating within interdependent workflows. Internal medicine admissions often require rapid risk stratification, laboratory evaluation, and imaging to guide early management. Surgical emergencies demand timely diagnostic confirmation and operative decision-making to prevent disease progression. Ophthalmic emergencies, while sometimes underestimated in urgency, involve narrow therapeutic windows in which delays may result in irreversible visual impairment. Radiology, as a cross-cutting specialty, underpins diagnostic accuracy and speed across all these domains [4-6].

Ophthalmology-related acute admissions present unique challenges within hospital systems. Acute vision loss, retinal detachment, endophthalmitis, and ocular trauma require rapid diagnosis and intervention to preserve visual function. However, these cases often experience delays due to limited availability of on-call ophthalmic specialists, competing emergency priorities, and reliance on advanced imaging modalities. Delayed ophthalmic assessment can result in missed therapeutic windows, particularly in retinal and neuro-ophthalmic conditions.[7-9]

Radiology plays a pivotal role in the acute diagnostic pathway, serving as the primary gateway to definitive diagnosis for a wide range of medical, surgical, and ophthalmic conditions. Delays in imaging acquisition or reporting can propagate across clinical pathways, postponing specialist consultation, procedural intervention, and treatment initiation. These delays are often exacerbated during after-hours periods, staffing shortages, and high patient volume, making radiology turnaround time a critical audit metric.[10-12]

Despite increasing recognition of these challenges, few clinical audits have comprehensively examined diagnostic and management delays across multiple specialties within the same acute admission cohort. Even fewer have provided granular analysis of ophthalmology and radiology workflows, which are frequently underrepresented in acute care audits. Existing evaluations tend to focus on single specialties or isolated time points, limiting the ability to identify systemic bottlenecks and interdepartmental dependencies.

Clinical audit serves as a fundamental tool for evaluating adherence to established standards, identifying deficiencies in care delivery, and informing quality improvement initiatives. By systematically measuring real-world practice against predefined benchmarks, audits provide actionable insights into process inefficiencies and opportunities for optimization. A multidisciplinary audit framework is particularly valuable in acute care settings, where delays are rarely attributable to a single specialty.

This audit was therefore designed to evaluate delays in diagnosis and management across ophthalmology, internal medicine, surgery, and radiology in acute hospital admissions. Particular emphasis was placed on ophthalmic emergencies and radiology turnaround times due to their critical influence on clinical outcomes and frequent involvement in delayed care pathways. By identifying specialty-specific and cross-specialty delays, this audit aims to inform targeted interventions to enhance acute care efficiency and patient outcomes.

MATERIAL AND METHODS

A prospective multidisciplinary clinical audit was conducted at Department of Ophthalmology, Alshifa Eye Trust Hospital, Rawalpindi. a tertiary care hospital over a six-month period. The audit included adult patients admitted acutely through the emergency department who required evaluation by at least one of the following specialties: ophthalmology, internal medicine, general surgery, and radiology. Standards were derived from institutional acute care protocols and widely accepted international time-based recommendations for emergency diagnosis and management.

Sample size was determined using Epi Info software, assuming a 50% expected compliance rate with diagnostic time standards, 95% confidence level, and 5% margin of error. The minimum required sample size was calculated as 384 acute admissions; a total of 420 cases were audited to account for incomplete data.

Inclusion criteria comprised adult patients (≥18 years) admitted acutely who underwent specialist consultation and/or radiological imaging within the first 24 hours of admission. Exclusion criteria included elective admissions, pediatric cases, patients discharged against medical advice, and cases with incomplete time-stamp documentation. Verbal consent was obtained, and patient confidentiality was maintained through anonymized data collection.

Data were extracted from electronic medical records using a standardized audit tool. Key time intervals recorded included time from emergency department arrival to initial clinical assessment, specialty referral, radiology request, imaging acquisition, report availability, definitive diagnosis, and initiation of treatment or surgical intervention. Ophthalmology-specific data included time to ophthalmic review, fundoscopy, ocular imaging, and procedure initiation. Radiology audit variables included modality-specific turnaround times, after-hours delays, and report verification intervals.

Data were analyzed using descriptive statistics and inferential tests. Continuous variables were expressed as mean and standard deviation. Comparisons between specialties were performed using ANOVA, and associations between delays and outcomes were assessed using regression analysis. Statistical significance was set at $p < 0.05$.

RESULTS

Table 1: Demographic and Admission Characteristics

Variable	Total (n=420)
Mean age (years)	56.4 ± 17.2
Female (%)	48.1
Ophthalmology admissions (%)	22.6
Internal medicine admissions (%)	34.3
Surgical admissions (%)	28.1
Combined specialty involvement (%)	15.0

This table demonstrates a representative acute admission cohort with substantial ophthalmology and radiology involvement.

Table 2: Specialty-Specific Diagnostic and Management Delays (hours)

Specialty	Time to Diagnosis	Time to Management	Compliance (%)	p-value
Ophthalmology	9.6 ± 4.2	14.3 ± 6.1	41.2	<0.001
Internal Medicine	6.1 ± 3.0	10.2 ± 4.5	62.8	0.02
Surgery	7.4 ± 3.6	11.8 ± 5.2	55.9	0.01

Ophthalmology admissions showed the longest delays and lowest compliance with recommended timelines.

Table 3: Radiology Audit – Imaging Turnaround Times

Imaging Context	Acquisition Time (hrs)	Reporting Time (hrs)	Delay Rate (%)	p-value
Routine hours	2.1 ± 0.9	3.4 ± 1.2	18.5	—
After-hours	5.8 ± 2.4	8.1 ± 3.3	46.7	<0.001
Ophthalmology-related imaging	6.3 ± 2.7	8.9 ± 3.6	51.2	<0.001

Radiology delays were most pronounced after-hours and in ophthalmology-dependent diagnostic pathways.

DISCUSSION

This multidisciplinary clinical audit identified significant delays in diagnosis and management across acute hospital admissions, with ophthalmology and radiology emerging as the most delay-sensitive specialties. The findings highlight systemic inefficiencies that extend beyond individual departments, underscoring the interdependent nature of acute care delivery [13-14].

Ophthalmology-related acute admissions exhibited the longest delays to both diagnosis and definitive management. Conditions such as acute vision loss, retinal detachment, and ocular trauma frequently exceeded recommended time thresholds, largely due to delayed specialist review and reliance on advanced imaging modalities. These delays are particularly concerning given the time-critical nature of many ophthalmic emergencies, where delayed intervention may result in irreversible visual loss [15-17].

Radiology emerged as a central determinant of downstream delays across all specialties. Prolonged imaging acquisition and reporting times, especially during after-hours periods, significantly impacted clinical decision-making and treatment initiation. Ophthalmology-related imaging demonstrated the highest delay rates, reflecting limited access to specialized ocular imaging and reduced prioritization within general radiology workflows.

Internal medicine and surgical admissions demonstrated comparatively better compliance with diagnostic standards, yet still experienced significant delays during interdepartmental referrals and imaging-dependent evaluations. These findings suggest that even well-established acute care pathways remain vulnerable to bottlenecks when reliant on shared diagnostic resources.[18-20]

The strong association between radiology turnaround time and overall management delay emphasizes the need for enhanced imaging prioritization protocols, particularly for time-sensitive conditions. Streamlining radiology workflows, expanding after-hours coverage, and implementing standardized reporting timelines may yield substantial improvements in acute care efficiency.

This audit also highlights the value of specialty-specific analysis within broader quality improvement initiatives. Aggregated acute admission data may obscure critical delays affecting smaller but high-impact specialties such as ophthalmology. Focused audits enable targeted interventions that address unique workflow challenges while maintaining system-wide coherence.

Collectively, these findings support the implementation of integrated multidisciplinary pathways that align emergency assessment, radiology prioritization, and specialty consultation. Such approaches may reduce diagnostic inertia, improve compliance with time-based standards, and enhance patient outcomes in acute care settings.

CONCLUSION
This multidisciplinary clinical audit demonstrates that delays in acute admission diagnosis and management are most pronounced in ophthalmology and radiology-dependent pathways. Radiology turnaround time represents a pivotal determinant of overall care efficiency, while ophthalmic emergencies face disproportionately prolonged delays. Addressing these gaps through integrated, protocol-driven multidisciplinary strategies may significantly improve acute care outcomes and patient safety.

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