

Improving Laboratory Test Turnaround Time Through Collaboration Between Secretary Nurses, Laboratory Specialists, and Medical Records Professionals

Alshahrani, Fahad Hadhram J^{1*}, Tareq Shaher Hadi Alqahtani¹, Fahad Mushabbab Alahmari¹, Ahmed Khalid A Alqahtani¹, Ali Ahmed Almubarak¹, Muqrin Mohammed Alqahtani², Abdulelah Mohammed Jahlan³, Abdulaziz Sayel Mohammad AlMutairi⁴

¹Armed Forces Hospital Southern Region, Khamis Mushait, Saudi Arabia

²Respiratory Therapist, Khamis Mushait, Saudi Arabia

³Armed Forces Hospital Southern Region, Khamis Mushait, Saudi Arabia | Registered Nurse | Email: b2sd@hotmail.com

⁴Northern Area Armed Forces Hospital, Ministry of Defense, Hafar Al-Batin, Saudi Arabia | Medical Records Technician | Email: zizsal20@gmail.com

¹Senior Specialist, Laboratory Microbiology (Alshahrani, Fahad Hadhram J) | Email: mr.fahd13@gmail.com

¹Specialist-Laboratory (Tareq Shaher Hadi Alqahtani) | Email: tt.ofg2021@gmail.com

¹Specialist-Laboratory (Fahad Mushabbab Alahmari) | Email: Fahad213456@gmail.com

¹Specialist-Laboratory (Ahmed Khalid A Alqahtani) | Email: Ahmdkl5055@gmail.com

¹Specialist-Laboratory (Ali Ahmed Almubarak) | Email: alqahtani-222@hotmail.com

²Respiratory Therapist (Muqrin Mohammed Alqahtani) | Email: Muqrinalaboud@hotmail.com

***Corresponding Author:** Alshahrani, Fahad Hadhram J, Senior Specialist, Laboratory Microbiology, Armed Forces Hospital Southern Region, Khamis Mushait, Saudi Arabia | Email: mr.fahd13@gmail.com

Abstract

Background: Laboratory test turnaround time (TAT) is a critical quality indicator in healthcare. It has a direct impact on patient safety, emergency department productivity, clinical decision-making, and general healthcare quality. Delays in laboratory testing often arise from communication failures, incomplete documentation, inefficient specimen management, and fragmented interdisciplinary collaboration.

Objective: This review explores how structured collaboration among secretary nurses, laboratory specialists, and medical records professionals can significantly improve laboratory turnaround time while enhancing patient safety and workflow efficiency.

Methods: A narrative review of current healthcare quality improvement literature was conducted. Evidence regarding laboratory workflow optimization, health information management, interdisciplinary teamwork, electronic medical records (EMRs), and laboratory information systems (LIS) was synthesized to identify collaborative strategies that reduce delays throughout the laboratory testing cycle.

Results: Successful collaboration improves every phase of laboratory testing, including order entry, specimen collection, transportation, analysis, result reporting, and documentation. Digital integration, standardized communication, and clearly defined professional responsibilities significantly reduce turnaround time and decrease laboratory errors.

Conclusion: Improving laboratory performance can be achieved through the establishment of cooperative multidisciplinary workflows backed by electronic information systems, increasing patient satisfaction, and promoting healthcare quality.

Keywords: Laboratory turnaround time, Secretary nurse, Laboratory specialist, Medical records, Electronic health records, Laboratory information system, Patient safety, Healthcare quality.

How to cite this article: Alshahrani FHJ, Alqahtani TSH, Alahmari FM, Alqahtani AKA, Almubarak AA, Alqahtani MM, Jahlan AM, Almutairi ASM. Improving laboratory test turnaround time through collaboration between secretary nurses, laboratory specialists, and medical records professionals. *Int J Drug Deliv Technol.* 2026;16(73s): 1328-1331. DOI: 10.25258/ijddt.16.73s.138

1. Introduction

Clinical laboratory testing contributes to approximately **70% of medical decisions**; Thus, effective laboratory services are necessary for providing high-quality medical treatment. A delayed diagnosis, a delayed start of therapy, a longer hospital stay, higher healthcare expenses, and worse patient

outcomes can all arise from delayed laboratory findings.

Laboratory turnaround time (TAT) measures the interval between physician test ordering and availability of validated laboratory results. Even though laboratory automation has significantly increased analytical performance, many delays

Improving Laboratory Test Turnaround Time Through Collaboration Between Secretary Nurses, Laboratory Specialists, and Medical Records Professionals

continue to occur during the **pre-analytical** and **post-analytical** phases.

Three professional groups play particularly important roles in reducing these delays:

- Secretary nurses
- Laboratory specialists
- Medical records professionals

When these professionals collaborate effectively using standardized workflows and digital information systems, laboratory efficiency improves substantially.

2. Importance of Laboratory Turnaround Time

TAT is recognized worldwide as one of the

most important laboratory quality indicators because it influences:

- Emergency department waiting times
- Clinical decision-making
- Patient safety
- Hospital efficiency
- Patient satisfaction
- Resource utilization
- Accreditation compliance (JCI, CAP, ISO 15189)

Long laboratory delays have been associated with increased emergency department crowding, delayed antimicrobial therapy, prolonged hospitalization, and increased mortality among critically ill patients.

3. Components of Laboratory Turnaround Time

Laboratory testing consists of three major phases.

Pre-Analytical Phase

Responsible for nearly **60–70% of laboratory errors**, including:

- Incorrect patient registration
- Missing demographic information
- Duplicate patient records
- Wrong specimen labeling
- Delayed specimen transportation
- Incorrect laboratory requests

Analytical Phase

Includes:

- Specimen analysis
- Quality control
- Instrument calibration
- Result validation

Modern laboratory automation has significantly shortened this phase.

Post-Analytical Phase

Includes:

- Verification
- Electronic reporting
- Documentation

- Physician notification
- Medical record integration

4. Role of Secretary Nurses

The point of communication between doctors, patients, nursing staff, and laboratory departments is represented by secretary nurses.

Their responsibilities include:

- Scheduling laboratory investigations
- Verifying physician orders
- Confirming patient identification
- Coordinating specimen collection timing
- Monitoring urgent requests
- Communicating critical laboratory

values

- Reducing incomplete laboratory requests

They also ensure that laboratory orders are entered correctly into the electronic medical record before specimen collection begins.

5. Role of Laboratory Specialists

Laboratory specialists ensure analytical accuracy and operational efficiency.

Their responsibilities include:

- Specimen acceptance
- Quality assessment
- Instrument operation
- Internal quality control
- Critical value reporting
- Result verification
- Continuous quality improvement

Modern laboratories increasingly rely on:

- Automation
- Barcoding
- Artificial intelligence
- Robotics
- Middleware software

These technologies significantly reduce manual errors and reporting delays.

6. Role of Medical Records Professionals

Medical records professionals maintain accurate patient information throughout the laboratory process.

Their contributions include:

- Patient registration accuracy
- Electronic health record management
- Laboratory result integration
- Coding and documentation
- Data privacy compliance
- Duplicate record prevention
- Clinical information retrieval

Accurate documentation minimizes repeated testing and improves continuity of care.

7. Collaborative Workflow

Improving Laboratory Test Turnaround Time Through Collaboration Between Secretary Nurses, Laboratory Specialists, and Medical Records Professionals

Effective collaboration requires continuous communication among all three professions.

Such coordination reduces unnecessary delays while improving patient safety.

	Healthcare Professional	Primary Responsibilities	Impact on Turnaround Time
1	Secretary Nurse	Appointment coordination, laboratory order verification, communication, specimen scheduling	Reduces ordering delays and communication errors
2	Laboratory Specialist	Specimen analysis, quality control, validation, reporting	Improves analytical efficiency and result accuracy
3	Medical Records Professional	Patient registration, electronic documentation, record integration, data management	Eliminates documentation errors and duplicate records
4	Collaborative Team	Shared communication, standardized workflows, electronic information exchange	Shortens overall laboratory turnaround time while improving patient safety

Examples include:

- Secretary nurse verifies laboratory request.
- Medical records professional confirms patient identity.
- Laboratory specialist receives correctly labeled specimen.
- Laboratory validates results.
- Results automatically integrate into electronic medical records.
- Secretary nurse informs physician of critical values.
- Physician initiates timely treatment.

Table 1. Multidisciplinary Roles in Improving Laboratory Turnaround Time

8. Digital Health Technologies Supporting Collaboration

Several digital innovations have transformed laboratory workflow.

Electronic Health Records (EHR)

EHR systems provide immediate access to lab findings and eliminate transcription errors.

Laboratory Information Systems (LIS)

LIS platforms manage:

- Specimen tracking
- Instrument integration
- Quality monitoring
- Automated reporting

Barcode Technology

Barcode systems improve:

- Patient identification
- Specimen labeling

- Sample tracking

Artificial Intelligence

AI applications support:

- Workflow optimization
- Predictive workload analysis
- Automated quality monitoring
- Detection of abnormal laboratory trends
- Prioritization of urgent specimens

9. Common Causes of Laboratory Delays

Several factors contribute to prolonged turnaround time:

- Incomplete laboratory requests
- Incorrect patient identification
- Missing documentation
- Specimen labeling errors
- Transportation delays
- Poor interdisciplinary communication
- Instrument downtime
- Staff shortages
- Manual reporting systems
- Duplicate medical records

Most of these occur before laboratory analysis begins.

10. Strategies for Improvement

Healthcare organizations should implement:

- Standardized laboratory request protocols
- Electronic physician order entry
- Barcode specimen tracking
- Integrated EHR–LIS communication
- Continuous staff education
- Daily turnaround time monitoring

Improving Laboratory Test Turnaround Time Through Collaboration Between Secretary Nurses, Laboratory Specialists, and Medical Records Professionals

- Performance dashboards
- Critical result notification systems
- Multidisciplinary quality improvement meetings
- Lean workflow redesign

These approaches typically reduce operating costs while increasing laboratory efficiency.

11. Benefits of Interdisciplinary Collaboration

Collaborative laboratory management produces measurable improvements:

- Faster laboratory reporting
- Reduced laboratory errors
- Better documentation quality
- Improved patient safety
- Higher clinician satisfaction
- Increased patient satisfaction
- Lower healthcare costs
- Reduced emergency department congestion
- Better accreditation performance
- Improved organizational efficiency

12. Future Directions

Future laboratory services will increasingly incorporate:

- Artificial intelligence–assisted laboratory prioritization
- Internet of Medical Things (IoMT)
- Predictive analytics
- Robotic specimen transportation
- Cloud-based laboratory information systems
- Real-time workflow dashboards
- Clinical decision support systems
- Machine learning for workload forecasting

These innovations will further strengthen interdisciplinary collaboration and improve laboratory turnaround time.

13. Conclusion

Improving laboratory turnaround time requires more than technological advancements; it depends on effective collaboration among secretary nurses, laboratory specialists, and medical records professionals. Every profession makes a distinct contribution to the process of laboratory testing, from accurate order entry and patient identification to specimen analysis and electronic documentation. When supported by integrated information systems, standardized communication protocols, and continuous quality improvement initiatives, this multidisciplinary approach reduces delays,

minimizes errors, enhances patient safety, and improves overall healthcare performance. Collaborative laboratory management should be given top priority by healthcare organizations as a key element of accreditation and quality improvement initiatives.

References

1. Plebani M. Errors in clinical laboratories or errors in laboratory medicine? *Clin Chem Lab Med.* 2006;44(6):750–759.
2. Plebani M. Quality indicators to detect pre-analytical errors in laboratory testing. *Clin Biochem Rev.* 2012;33(3):85–88.
3. Hawkins R. Managing the pre- and post-analytical phases of the total testing process. *Ann Lab Med.* 2012;32(1):5–16.
4. Lippi G, et al. Laboratory turnaround time: An update. *Clin Chem Lab Med.* 2020;58(11):1741–1750.
5. World Health Organization. *Laboratory Quality Management System Handbook.* Geneva: WHO; 2011.
6. International Organization for Standardization. *ISO 15189:2022 Medical laboratories—Requirements for quality and competence.* Geneva: ISO; 2022.
7. College of American Pathologists (CAP). *Laboratory Accreditation Program Checklists.* Northfield, IL: CAP.
8. Joint Commission International. *Joint Commission International Accreditation Standards for Hospitals.* 8th ed.
9. Institute of Medicine. *To Err Is Human: Building a Safer Health System.* Washington, DC: National Academies Press; 2000.
10. Sittig DF, Singh H. Electronic health records and national patient-safety goals. *N Engl J Med.* 2012;367:1854–1860.