ISSN (print): 2589-9120
ISSN (online): 2589-9139

International Journal of Medical Science and Applied Research (IJMSAR)

Available Online at: https://www.ijmsar.com

Volume – 3, Issue –1, January – February - 2020, Page No. : 26 - 28

Turn Around Time (TAT) As A Benchmark For Laboratory Performance And Root Cause Analysis For Its Delay

[1]Dr Saloni, MD Biochemistry, Assistant Professor Biochemistry, PGIMER Satellite centre, Sangrur, Punjab, India.

[2]Dr Neha Mittal, MD Biochemistry, Assistant Professor Biochemistry, PGIMER Satellite centre, Sangrur, Punjab, India.

Corresponding Author: [1]Dr. Saloni, MD Biochemistry, Assistant Professor Biochemistry, PGIMER Satellite centre, Sangrur, Punjab, India.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Turnaround time is often used by clinicians as one of the parameter for laboratory performance. Despite so many advances in analytical technology, computerization and transport systems, many laboratories fail to improve their TATs.[1] Clinicians demands fast TATs for early diagnosis and treatment of patients. So, Improvement of TAT is must for every laboratory to ensure quality management and patient satisfaction.[2]

Objectives: Measurement of turnaround time for common clinical chemistry examinations and performing root cause analysis for causes for inadequate turnaround time for examinations.

Materials and Methods: The TAT data was measured from samples received by our laboratory from outdoor services during a period of October 2019 – December – 2019 in PGIMER Satellite centre, Sangrur. Sample size : 1553Various time periods were recorded, calculated and evaluated. Root cause analysis for delay in TAT was performed .

Results and Conclusions: Average TAT for OPD patients is 22 hours 28 mins. Pre-analytical and Post-analytical phases were found to contribute approximately 75% to the total TAT. The study shows that lack of man power, reflex testing, repeat testing and manual dilution of samples are the root cause of delay in TAT.

Keywords: Turnaround time, root cause analysis, reflex testing and repeat testing.

Introduction

Quality is defined as conformance with requirements of users and customers. Biochemists invest their most of the time on quality management process to be sure the results given to the physicians are accurate.Total quality management of the clinical laboratory includes Quality planning, quality laboratory process, Quality control, Quality assessment and Quality Improvement. Turn around time is often used by clinicians as one of the parameter for laboratory performance. Despite so many advances in analytical technology, computerization and transport systems, many laboratories fail to improve their TATs.[1] Clinicians demands fast TATs for early diagnosis and treatment of patients. So, Improvement of TAT is must for every laboratory to ensure quality management and patient satisfaction.[2] Turnaround time may depand on various factors like type of test performed, priority of test, type of patient and also on activities.For laboratory personnel, TAT includes time from receipt of sample in laboratory to generation of report. Whereas clinicians consider TAT from time of test requisition till receipt of report.[3]

Materials and Methods

The turnaround times (TATs) of common biochemistry tests ordered by physicians for OPD patients were

evaluated and performed by automated analyzer and evaluated. Labelling of the vacutainers by stickers was done at OPD. On label, only collection time of that particular sample was written and that made identity to that sample for measuring time at various steps.The TAT data was measured from samples received by our laboratory from outdoor services during a period of October 2019 – December – 2019 in PGIMER Satellite centre, Sangrur.

Sample size : 1553

Average TAT : 22 hours 28 min

Table 1: Observation sheet for record of TAT of various sections

- Date
- Sample i.d.
- Collection time
- Receiving time
- Centrifugation time
- Separation time
- Analysis completion time
- Report sending time

Table 2: Master table of contribution of various examination steps to total TAT

Time period	Average time taken (min)	%age of total time
Receiving time	60	4.45
Centrifuge time	13	0.95
Aliquating time	19	1.4
Analysing time	223	16.54
Dispatching time	1033	76.63
Total time	1348	

Table 3: Master table of comparison of contribution of various phases to total TAT

	OPD
Pre analytical	5.4
Analytical	17.94
Post analytical	76.63

For measurement of TAT, it was classified into 3 phases:

1. Pre-analytical;
2. Analytical; and
3. Post-analytical.

The pre-analytical phase included: Blood collection time recorded in observational sheet. The analytical phase included:Centrifugation time of samples was recorded manually in printed sheet. Separation time of samples was also recorded manually .Sample analysis completion time was recorded in LIS automatically

The post-analytical phase included:

Reporting time of results to physicians recorded in LIS when report is printed for delivery.

1.Difference between various time period and total time was calculated by simple mathematical

algorithms in Microsoft excel.

2. Percentage time contributed by particular phase to total time period was calculated.

3. Root cause analysis was performed for delay in TAT.

The main causes are: Lack of man power, reflex testing, repeat testing and manual dilution of sample.[4]

Results

TAT was calculated from sample collection to report dispatch. The average TAT recorded in this study is

22 hours 28 min.

The Master table of comparison of contribution of various examination steps to total TAT is described in

Table 2 and percentage contribution for the various phases in Table 3.

Discussion

The study concluded that Pre-analytical and Post-analytical phases were found to contribute. approximately 75% to the total TAT. The TAT demonstrates the need for improvement in the pre-analytical and post-analytical periods. Some of the causes and suggestions for that improvement are discussed here.

1. Lack of man power

There were limited person for transporting samples from OPD. Sometime relatives of patient come with samples to the laboratory and thereby it can take time for searching laboratory. Same scenario is observed with reporting of sample. Although there are two persons for transport of samples and taking reports but there is lack of dedicated system Thereby pre-analytical and post analytical part contribute more in total TAT. This can be improved with the help of automatic transport system like pneumatic system.

Currently only one automated instrument is there in laboratory that is Cobas c311 auto analyzer.

Currently samples are analyzed one by one regardless of whether they are urgent or routine, because majority of samples are labeled “urgent” indiscriminately. So that clinicians have to wait for report of urgent sample. Due to that line of management of patient may be delayed. Strict institutional policy for labeling urgent sample only when required can improve TAT for REALLY URGENT samples

2. Reflex testing

Testing performed as a result of initial test results. It is used to further identify significant diagnostic. information required for appropriate patient care. As per current scenario, laboratory is doing direct \ bilirubin reflexly when S. Total bilirubin result is > 1 mg/dl. But there is no facility in instrument for identifying that automatically. Sothat technician and resident doctors have to put samples for completion of those reflex tests after completion of batch or when they are notified. This may lead to prolongation of TAT.

3. Repeat examinations

There may be delay in TAT when sample volume is insufficient for doing all test requested by clinicians or there is emptying of reagent in between analysis. If sample has clot, machine may not analyze it in running batch. There may be some contamination of sample . So repeat examination is requested to clinician for that sample.

4. Manual dilution of sample

There is limitation of linearity in current instrument. So certain samples exceeding that linearity limit have to be put after manual dilution of sample. For that improvement, instrument with high linearitylimit and facility for automatic dilution has to be purchased.

Conclusions

Average TAT for OPD patients is 22 hours 28 mins. Pre-analytical and Post-analytical phases were found to contribute approximately 75% to the total TAT

References

1. Hawkins R. Laboratory Turnaround Time. *Clin Biochem Rev*. 2007;28(4):179–194.
2. Goswami B, Mallika V. Turn Around Time (TAT) as a Benchmark of Laboratory Performance. *Indian J Clin Biochem*. 2010;25(4):376–379.
3. Steindel S J, Howanitz P J. Physician satisfaction and emergency department laboratory test turn around time. Arch Pathol Lab Med 2001:125:863-871.
4. Kaoru I. Guide to Quality Control. Tokyo: JUSE ; 1968,.