Sample Rejection As A Quality Indicator For Continual Improvement Of Laboratory Services, Tertiary Care Hospital

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Abstracts: **Background:** Quality in the health care institutions is multifaceted & multidimensional with its core element as the customer's satisfaction. Improvement in the health care services is a long drawn relentless process which can be achieved by implementing a carefully planned Quality Management System. Laboratory services B.J. Medical College & Civil Hospital Ahmedabad, has set its Quality indicators and is monitoring it as a part of continual improvement. One of the Quality indicators is Sample rejection. The laboratory aims to reduce the sample rejections by complying with the standards & recommended guidelines. **Methods:** This is to monitor & analyze the Sample Rejections as a Quality Indicator for Continual improvement of the Microbiology Department. Primary data collection done before training & secondary data collection done after the training of nursing staff & Resident Doctors. **Results:** The sample rejection rate of the Microbiology Laboratory in the month of July 2010 was 0.31%. After the training of the nursing staff as well as resident doctors regarding proper collection & transport of samples based on scientific principles, a decreasing trend in the sample rejection rate is observed. i. e. from .31% to 0.11 % in the 13 months duration of study.**Conclusion:** The implementation of a systematic error-tracking system i.e. monitoring the sample rejections, analysing its trend, taking preventive & corrective actions to reduce the sample rejection rate in daily practice definitely improves the quality of the laboratory results and is a quality indicator for continual improvement of the laboratory [Soni S NJIRM 2014; 5(1) : 72-75]

Key Words: Quality Indicator, Continual Improvement, Sample Rejection, Preanalytical error

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Introduction: A Quality in the health care institutions is multifaceted & multidimensional with its core element as the customer's satisfaction. Improvement in the health care services is a long drawn relentless process which can be achieved by implementing a carefully planned Quality Management System[1]. The system must be output oriented & process driven. Implementing Quality Management System in laboratory service is to provide the test results which are reliable, relevant, accessible & available in timely manner. The concept of quality changed from perception to measurement

Quality in the health care institutions is multifaceted & multidimensional with its core element as the customer's satisfaction. Improvement in the health care services is a long drawn relentless process which can be achieved by implementing a carefully planned Quality Management System. The system must be output oriented & process driven. Implementing Quality Management System in laboratory service is to provide the test results which are reliable, relevant, accessible & available in timely manner. The concept of quality changed from perception to measurement. The laboratory Services can be viewed as bridging endeavor, linking the basic medical, biological & physical science with medical practice.Thus keeping in mind the great importance of clinical laboratories in the practice of modern medicine today, it is imperative for the laboratories to be totally committed to quality.

In this era of evidence based practice the measurable parameters of the quality are defined, measured & monitored as a part of continual improvement.The laboratory Services are committed " To provide The right test result, at the Right time, on the Right specimen, from the Right patient, with result interpretation based on Correct reference data, and at the Right price.

Laboratory service has set its Quality indicators and is monitoring it as a part of continual improvement. One of the Quality indicators is Sample rejections. The laboratory aims to study, analyse & monitor the sample rejections as a quality Indicator for continual improvement of

Microbiology Department, Laboratory Services B.J. Medical College & Civil Hospital Ahmedabad.

Material and Methods: Laboratory service, B.J. Medical College and Civil Hospital, Ahmedabad is one of the largest laboratories of the tertiary health care service providers in India. The laboratory services is receiving, processing & reporting approximately 50,300 samples per month i.e. Pathology 17500/month, Microbiology 16800/month & Biochemistry 16000/month.It participates in various health related programs of state and Central Government in collaboration with WHO. With the huge workload the laboratory services implemented the quality management system. Laboratory Services got NABL accreditation in July 2010. Laboratory services B.J. Medical College & Civil Hospital Ahmedabad, has set its Quality indicators and is monitoring it as a part of continual improvement. One of the Quality indicators is Sample rejections.

Study Design: This is to monitor & analyze the Sample Rejections as a Quality Indicator for Continual improvement of the Microbiology Department, Laboratory Services B.J. Medical College & Civil Hospital, and Ahmedabad. It is to reduce the sample rejections by complying with the standards & recommended guidelines.

Data Collection Tools

Primary Data: Retrospective data analysis of the sample rejections of months of January to July 2010 to find out the sample rejection rate.

Secondary Data: Data collection of Sample Rejections for September 2010 to July 2011 after the training of nursing staff & Resident Doctors in July 2010.Analysis of the Collected Data to find out the sample rejection rate.

TO EVALUATE THE SAMPLE REJECTION AS QUALITY INDICATOR FOR CONTINUAL IMPROVEMENT USING W. EDWARDS DEMING'S PLAN-DO-CHECK-ACT (PDCA) **MODEL AS FOLLOWS:**

Plan : Laboratory services has set as the Quality Indicator & Monitor it. The laboratory staffs are educated on the importance of the process and are trained.

Do : The plan is implemented and the values recorded in the data collection formats. Further data are collected and the trends are analyzed. According to the trend observed, the majority of the reasons for sample rejections are: Training issues, improper labelling, and incomplete request form. We decided to conduct training sessions for Nurses & Resident doctors on proper collection & Transport of Specimen. Emphasis on instructing the patients clearly on the specimen collection process and explaining to them if any special conditions are required.

Check : The data is analyzed .It is recommended to arrange more training sessions to further improve on the indicator value.

Act :The results are expected and there is decrease in the Rate of Sample Rejection. As it is decided to improve further, it is recommended to go through the cycle again and plan for the improvement on the basis of individual reasons and their trends.

Result: Microbiology Department has received & processed approximately 16800 samples per month. As per the sample rejection criteria established by the Department, the samples received, which were not fulfilling the criteria were rejected.

Table 1 - Sample rejection rate of Department of Microbiology before training.

Month 2010	Sample Rejection Rate
January,10	0.9
February,10	0.6
March,10	0.8
April,10	0.7
May,10	0.8
June.10	0.4
July,10	0.3

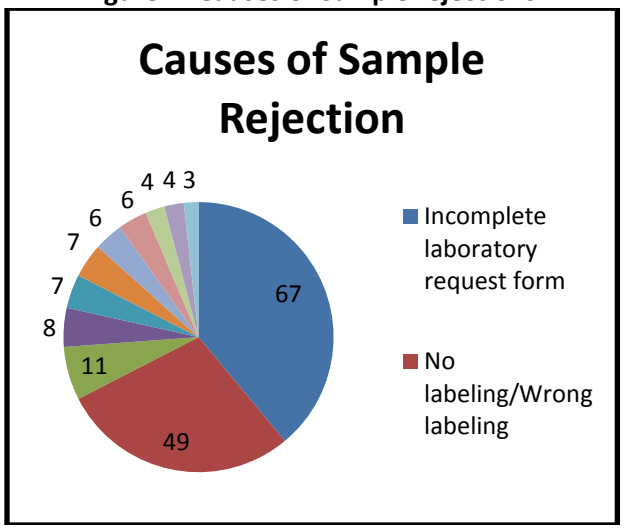
Discussion: The sample rejection rate of the Microbiology Laboratory in the month of July was 0.31%. After the training of the nursing staff as well as resident doctors regarding proper collection & transport of samples based on scientific principles, a decreasing trend in the sample rejection rate is

observed. i. e. from 0.31% to 0.11 % during the study.

Table 2 -Sample rejection rate of Department of Microbiology after training.

Month	Sample Rejection Rate
September ,10	0.23
October,10	0.21
November,10	0.25
December,10	0.22
January,11	0.18
Februry,11	0.19
March,11	0.17
April,11	0.22
May,11	0.21
June,11	0.16
July , 11	0.11

Figure-1: Causes of Sample rejections



The total testing process is typically divided into three main phases (pre-, intra- and post-analytical), exploration of the beginning and end of the loop reveals that currently, pre- and post-analytical steps are more error-prone than intra-analytical processes [2]. This phase starts with test request, patient and specimen identification, blood drawing, sample collection and handling, and ends with the transportation of specimens to the laboratory. A continuous effort must be made in order to ensure proper collection and transportation of clinical specimens. The error tracking within laboratory practice appears crucial [3]. A suitable approach is to develop a system based on representative preanalytic performance measures and on criteria for specimen acceptability [4].

Process analysis had demonstrated that laboratory errors occur primarily in the preanalytic phase, influencing patient outcomes and costs [5,6,7] Preanalytical error contributes about 46-68.2% of the total error[4].The performance of the laboratory can be improved by monitoring these errors.

Among all the causes, the major contributor of the sample rejection was the incomplete request form, contributing about 67 % of the total rejections during the period of study, which was due to the tremendous workload. Another contributor was improper labelling or no labelling 49% of the total rejections which was again due to the huge workload.

This study was comparable with study of H.Ning which showed the overall specimen rejection rate decreased significantly from 2.35% to 1.62% in Chang-Gung Memorial Hospital, Tao-Yan, Taiwan[8] .The cooperation between laboratory personnel and nursing staffs appeared to improve greatly the sample collection accuracy. The rejection rate of 1.4% of Ricos etal[9] was comparable rather than 0.9% of Goswami etal[3] & 0.7 % of Alsina etal[4] .

Conclusion: The preanalytical error is one of the major errors. Many components of the specimen management process occur in the preanalytical stage of analysis where the laboratorian may not be directly involved; i.e., specimen selection, collection and transport. Thus training of the health personnel involved in the process & implementation of a systematic error-tracking system i.e. monitoring the sample rejections, analysing its trend, taking preventive & corrective actions to reduce the sample rejection rate in daily practice is required for improvement of the quality of the laboratory results and for continual improvement of the laboratory.

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