

Study on Lab Reagents Utilization and Its Impact on Cost in Manipal Hospital, Jaipur

By

Manish Bakshi

*Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management*

Academic year, 2016-2018



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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Manish Bakshi** student of MBA Hospital & Health Management from The IIHMR University, Jaipur has undergone dissertation training at **Manipal Hospital, Jaipur** from **5th February 2018 to 4th May, 2018**.

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.



(Col.) Dr. Ashok Kaushik
Dean, Academics and Student Affairs
The IIHMR University, Jaipur



Dr. Monika Chaudhary
Associate Professor
The IIHMR University, Jaipur



The certificate is awarded to

MANISH BAKSHI

In recognition of having successfully completed his Internship in the department of

OPERATIONS

and has successfully completed his Project on

**“STUDY ON LAB REAGENTS UTILISATION AND IT’S IMPACT ON COST IN
MANIPAL HOSPITALS, JAIPUR”**

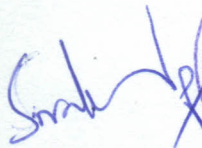
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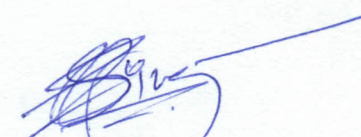
MANIPAL HOSPITALS, JAIPUR

He comes across as a committed, sincere & diligent person who has a strong
drive and zeal for learning

We wish him all the best for future endeavors



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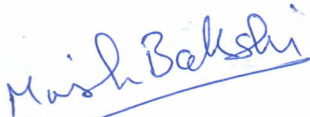
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**DEPUTY MANAGER OPERATIONS
MANIPAL HOSPITAL (JAIPUR)**

THE IIMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **STUDY ON LAB REAGENTS UTILIZATION AND ITS IMPACT ON COST IN MANIPAL HOSPITAL, JAIPUR** and submitted by **Manish Bakshi** Enrollment No. **IIMR-U/01/2016-18/0441** under the supervision of **Dr. Monika Chaudhary** for award of **MBA in Hospital and Health Management** of the University carried out during the period from **5th Feb 2018 to 4th May 2018** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.


Signature

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1. INTRODUCTION

Laboratory ‘testing is an integral part of modern medicine, with test results influencing diagnosis, prognosis, and management of disease. With increasing concerns about the overall rising costs of healthcare, a number of studies have analysed utilization of laboratory testing.’ Inappropriate laboratory utilization (‘mis-utilization’) may include underutilization (not ordering clinically indicated testing) and overutilization (ordering tests too often), as well as ordering incorrect testing. Laboratory testing contributes significantly to the overall cost of hospitalization. Moreover, mis-utilization of laboratory testing can potentially result in substantial downstream effects including iatrogenic blood loss, patient angst, invasive procedures, follow-up testing, and unnecessary specialist referrals.’

Utilization management has been a traditional approach to control costs in health-care systems. This is particularly true for ancillary services such as the clinical laboratory, pharmacy, and radiology. These services are often targeted because they are generally perceived to be significantly over utilized (or miss-utilized) and because they are usually readily quantifiable. Volume and unit cost data can be easily obtained to estimate the aggregate savings resulting from individual utilization management initiatives. Overutilization of laboratory services has been documented for several decades.

The clinical laboratory usually accounts for approximately 4 % of the typical hospital budget. Therefore, at first glance, it would not appear that much money could be saved by reducing expenditures for laboratory services. However, the operating budgets of most hospital laboratories are still substantial.

The lab was divided into various sections like biochemistry lab, molecular lab, cytology lab, histopathology lab and haematology lab reagents. A reagent is a substance or compound added to a system to cause a chemical reaction, or added to test if a reaction occurs. The terms reactant and reagent are often used interchangeably, however, a reactant is more specifically a substance consumed in the course of a chemical reaction. Solvents, though involved in the reaction, are usually not called reactants. Similarly, catalysts are not consumed by the reaction, so they are not reactants. In biochemistry, especially in connection with enzyme-catalysed reactions, the reactants are commonly called substrates.

Test utilization is a strategy for performing appropriate laboratory and pathology testing with the goal of providing high-quality, cost-effective patient care. Test utilization is important for good patient care and good medical practice, and there is an economic demand for it.

2. REVIEW OF LITERATURE

Audits are part of the continuous quality improvement process and one of the key elements of clinical governance. Laboratory-based clinical audits are concerned primarily with the everyday aspects of laboratory services and are a means of providing feedback to the users of the laboratory and its staff. They involve measuring the performance of laboratory services against established standards. These standards have ideally been established using the principles of evidence-based findings done before.

If necessary, changes are implemented and then a re-audit is performed after a certain time period to ensure that the changes have been implemented and maintained. Areas of audit in the laboratory include the pre analytical, analytical and post analytical phases. This review article examines on the basis of clinical audits in the laboratory and then proceeds to describe in detail how a laboratory-based clinical audit should be performed and monitored, with special reference to the chemical pathology laboratory

With the help of these audits and the result so obtained, a gap analysis of the entire scenario of Reagent Indent, consumption and actual consumption would be done. A comparative study of the no. of tests done and the no. of potential tests would be done to find the proper utilization and variation. Impact of the cost so incurred will then be analysed on the overall hospital revenue.

3. AIM OF STUDY

To study the utilization pattern of lab reagents and understand its impact on cost in Manipal Hospital.

4. OBJECTIVES OF THE STUDY

- To determine the current utilization of lab reagents in the hospital
- To find out the gap available in the current lab reagents utilization
- To analyse the impact on the cost by understanding the utilization pattern of the lab reagents
- To give recommendations to improve the indent and consumption process of reagents in the Hospital Laboratory.

5. RATIONALE

Laboratories are the most essentials and high revenue generating department for the hospital Therefore study was done which shows a low profitability in the laboratory.

This project explores the gaps in the functioning of the lab and find out the ways to improve the profitability for the same in the Manipal Hospital.

6. METHODOLOGY:

Type of study:

Descriptive and Observational study was done to study the utilization of the lab reagents and to know its impact on the cost for the hospital.

Study location:

Manipal Hospital, Jaipur

Duration of study:

3 months (February, 2018 to May, 2018)

Type of data:

Quantitative data was collected for the analysis.

Technique:

Study of relevant maintained records was done which was collected from the secondary data in HMIS, observation was done to know the process and protocols that are being followed and interview of the lab staff was done.

Data collection:

- Primary data collection (through interview, observation)
- Secondary data collection (From April, 2017 to March, 2018)
- From the hospital information system (HIS) Reports like Lab order work list, IP/OP billing revenue report, indent report, over all consumption Report, Order item statistical report, Purchase order report, etc.

Data collection instrument:

Retrospective Data from Hospital Information System about the existing stock reports

Data entry:

Manual entry was done in excel sheet to analyse the data.

Data analysis:

Done in the Microsoft Excel, further using charts and graph for better understanding.

DATA ANALYSIS

1. REGENTS UTILIZATION

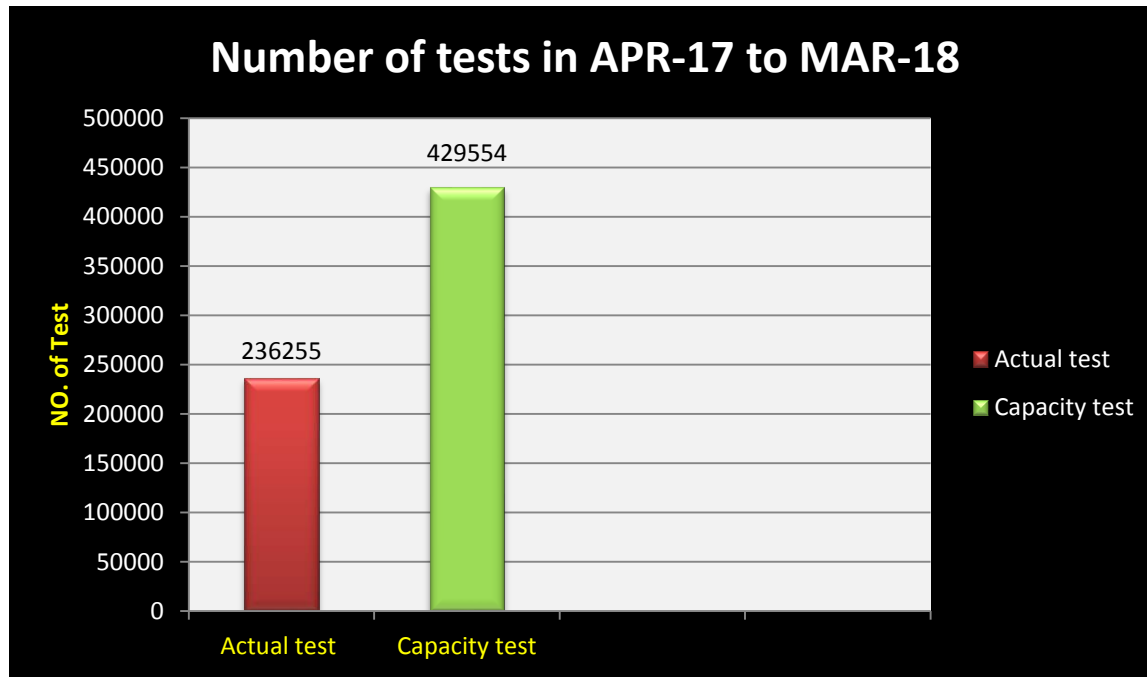


Fig1. Depicts the number of test that has been performed in the in last one year that is April' 2017 to May' 2018 and the actual capacity test that can be performed.

Table 1.

S.no	Test done	No of test
1	Actual Test	236255
2	Capacity Test	429554

It shows difference between the actual test performed and capacity test

- Therefore, the overall utilization in percentage is calculated by:

$$\text{Actual test done} / \text{capacity test} \times 100 = 55\%$$
- Therefore 55% overall utilization has been analysed from the one year data, which was done for 220 reagents.
- The study was done on 40 reagents out of 220, as these 50 reagents are 19% of the total reagents and consists of 53% of the total reagent purchase value.

2. REAGENT UNDER-UTILISED

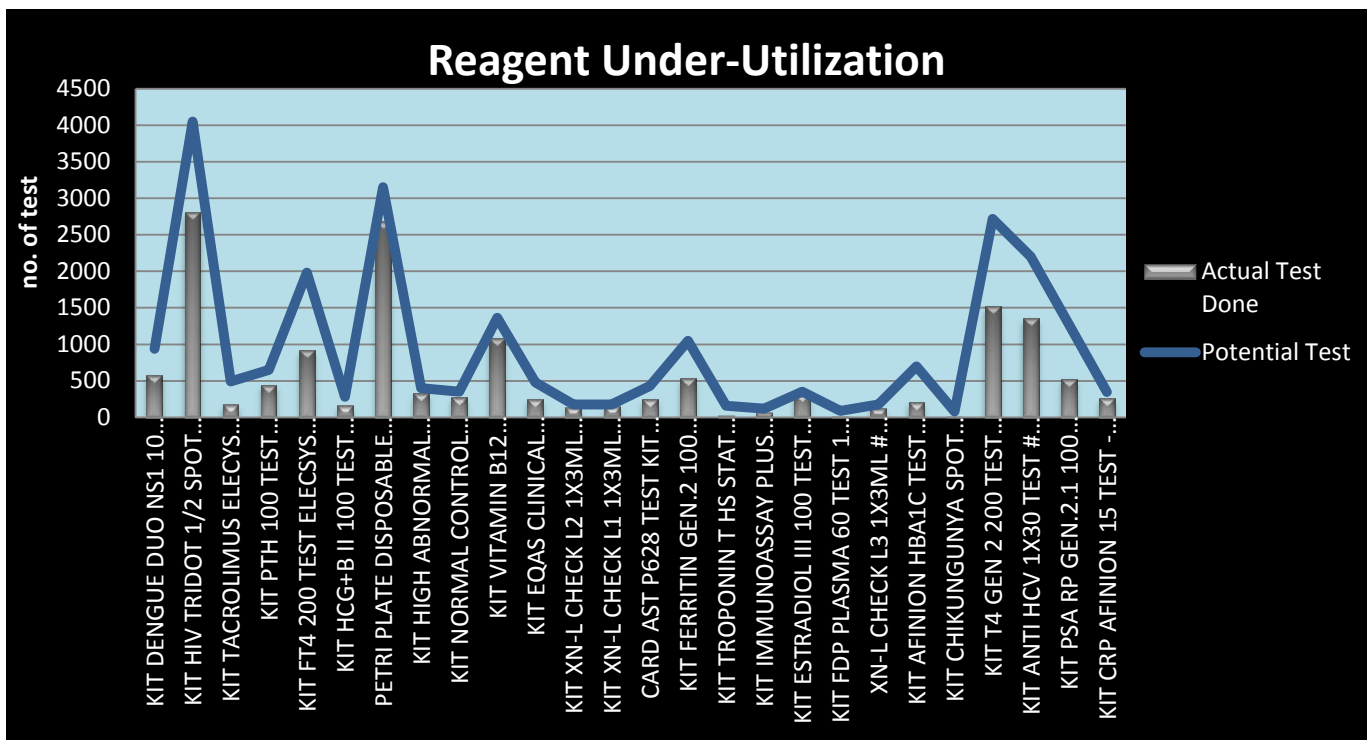


Fig 2. Depicts the 30 reagents that are underutilised among the 40 reagents that are taken in the study.

There is difference between the actual test done and the potential test that has been performed in the lab and the utilization of reagents is 57%.

3. REAGENT OVER-UTILIZATION

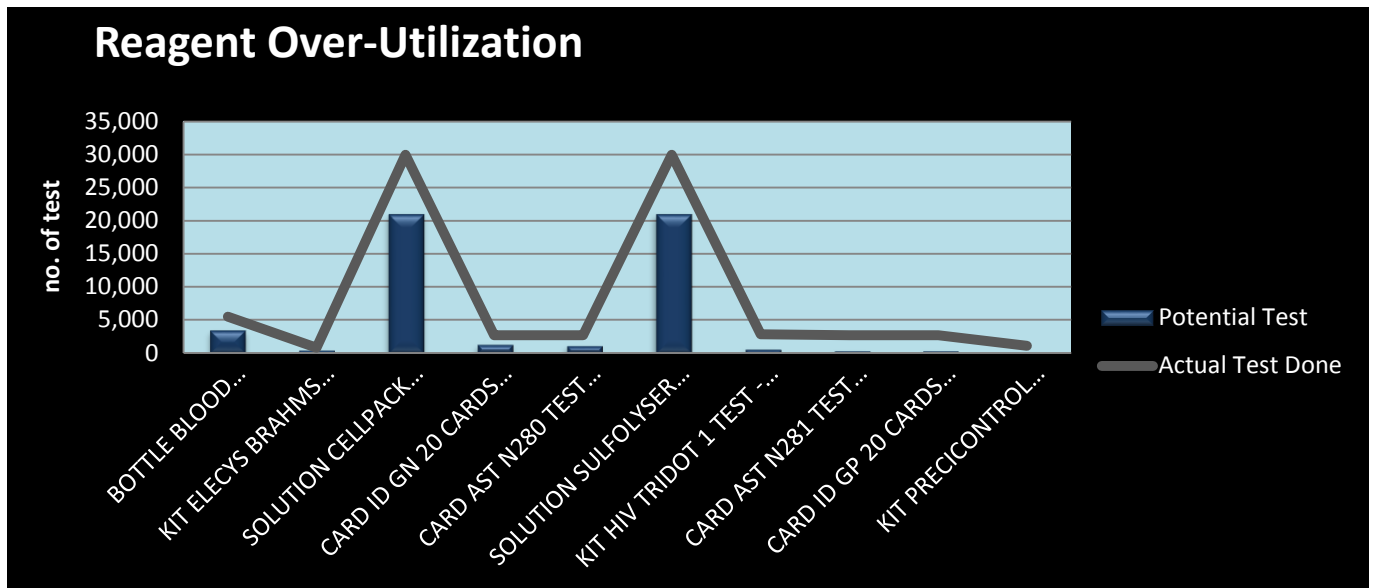


Fig3: Depicts the Reagent over-utilization, there were 10 reagents that were over utilized among the 40 reagents taken in the study.

4. Over all Reagents Utilization

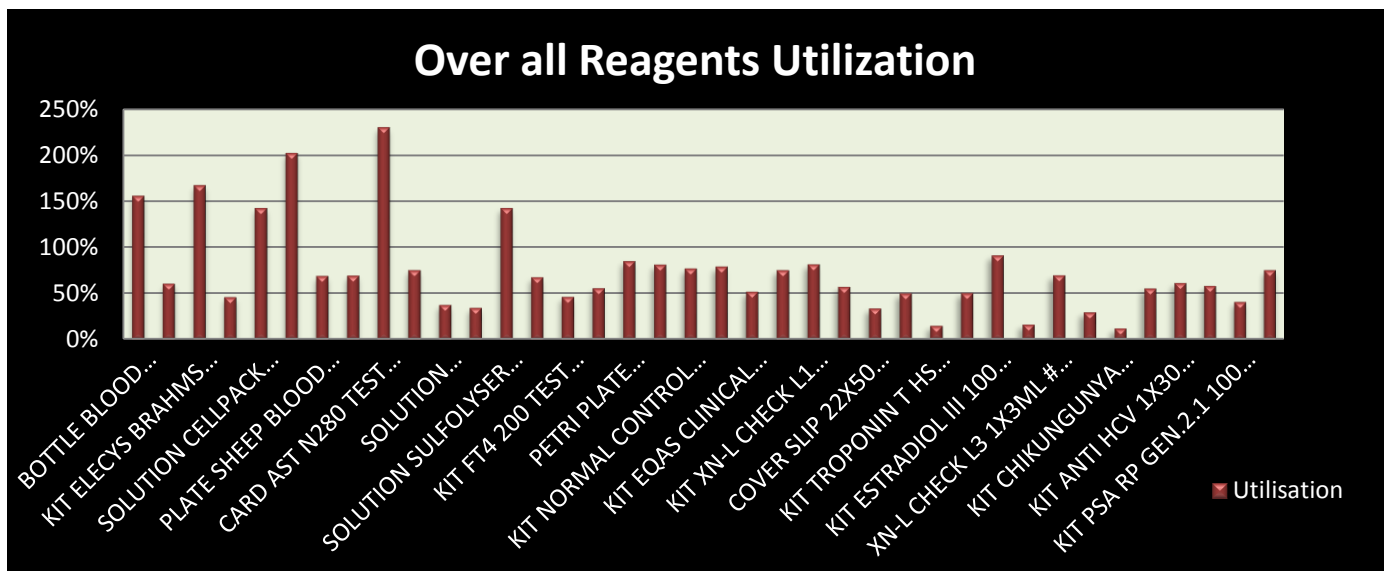


Fig 4. Depicts the percentage of overall reagents utilization

5. Reagent Utilization Proportion

■ Under Utilisation <80% ■ Over Utilisation >80% ■ 100%-80%

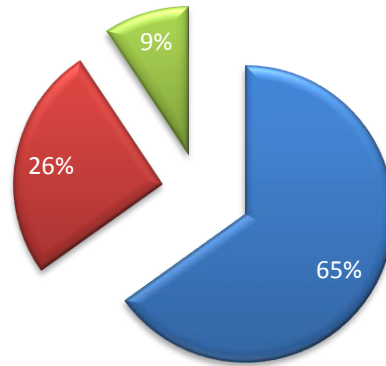


Figure 5. Depicts the percentage of underutilization, over utilization and reagents utilization between 80% to 100%.

Impact on Cost

Utilization analysed for the 40 reagents	57%
Revenue generated from the investigation in the last financial year from 40 reagents	100%

40 reagents	Cost Before utilization analysis	Cost After utilization analysis
Cost incurred by the hospital in last financial year.	23%	13%
Margin from the investigation performed in last financial year.	77%	87%

Margin from these investigations for the last financial year can be increased up to.	10%
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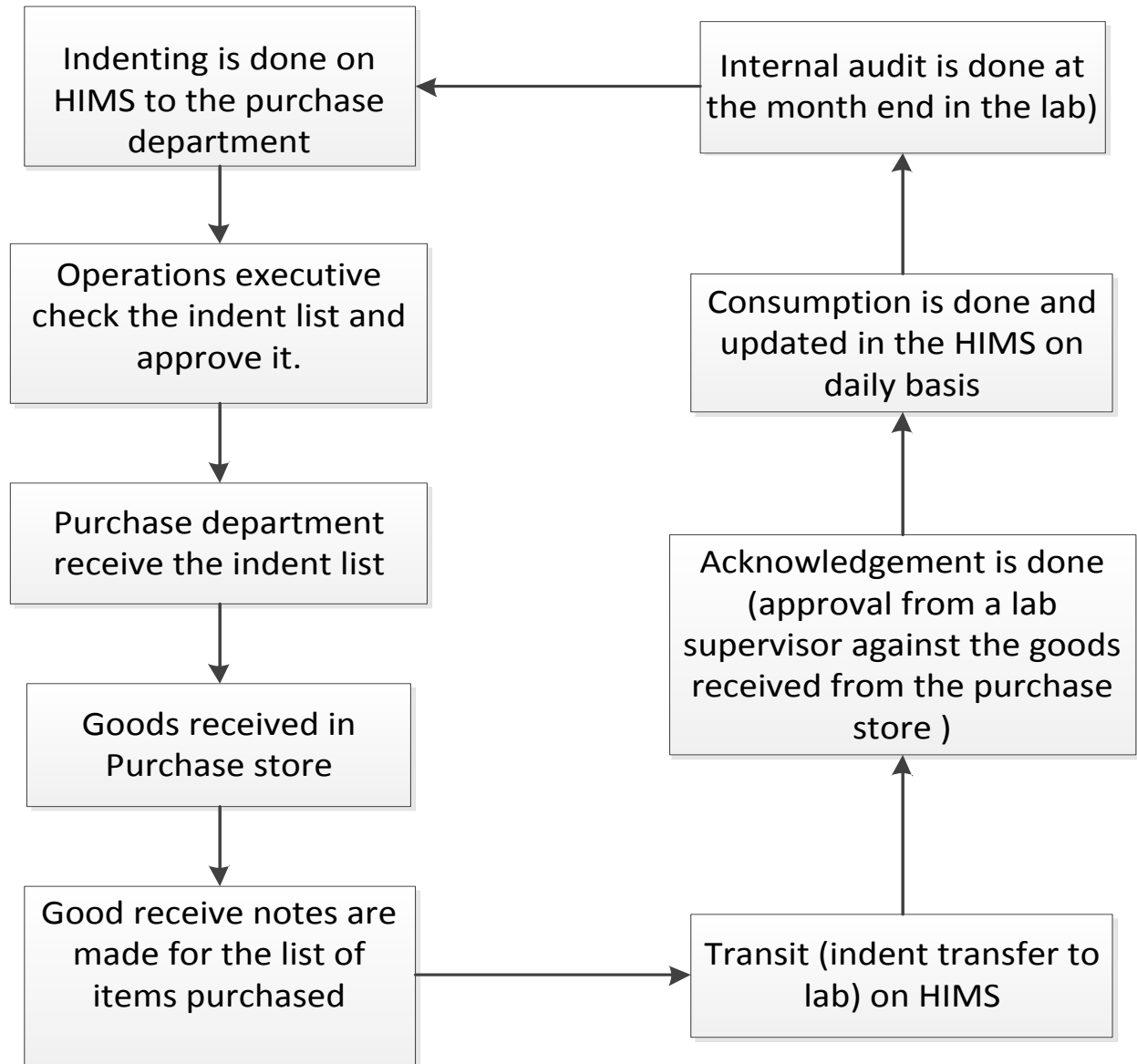
FINDINGS

- Indent and consumption of all the items in the lab were not centralised as individual intending was done.
- The reorder level was not set for the items.
- Indent and consumption process flow was not followed correctly.
- There was leakage and pilferage against the reagents items
- Two equipment run at the same time in the lab, which need extra calibration and quality control.

RECOMMENDATION AND IMPLEMENTATION

- Process flow was set for the indent and consumption of the lab reagents
- Centralising all the indent and consumption item in the lab is done.
- Implementation of the reorder level is required for smooth an effective functioning of the lab
- The working of only one equipment that is (E4/11) was recommended to be commenced; it would lead to proper utilization of the resource which was implemented.

Process flow for the Indent and consumption for the lab reagents



This process map was designed and implemented for the indenting and consumption of the lab reagents to make the process more accurate and effective and avoid any misuse, over or under utilization of the lab reagents:

1. Indenting is done from the lab for the required items to the purchase department in the HMIS.

Every section of the lab like biochemistry, histopathology, haematology, microbiology and cytology were indenting there items individually which cause delay in receiving the indent items and the process was not under control.

Implementation:

- Now the process is being formulated for the indenting and consumption,
 - All the sections of the lab has centralised indent process which give a control to the process.
 - Lab supervisor is responsible for requesting the indent items for the sections of the lab which has to be done within first week of the month, expect some emergency items
2. There was no proper check on the list of the indent items which leads to over indenting of the items or the regents and it also leads to high cost to the hospital.

Implementation:

Operation executive keeps a check on the list that has been updated by the lab supervisor on the HMIS system to keep the track on the ordered items to avoid any over indenting of the lab reagents and to have check on the cost control

3. GRN (Goods receive notes) which include the item list that is purchased from the vendor which has to be updated in HMIS by the purchase department while receiving the items to keep the track on the purchase, which was not followed by the purchase department due to urgent requirement in the lab.

And due to improper or pending GRN there was no compliance of the acknowledgement of the items in the system by the lab technician which leads to improper tracking of the items purchased.

Implementation:

- GRN (Goods receive notes) was set mandatory to be updated in the system at the time of the receiving the goods from the vendor without any failure or delay.
 - Without updating GRN in the system purchase store cannot transfer the items to the lab
 - Lab technician could not receive the items indented without GRN been updated in the system
 - Purchase department has to handover the received item to the lab within first week with GRN
Which leads to no delay in receiving the items and it also reduces the emergency requirement of the lab.
 - Following GRN without any failure helps in keeping the track to all the items purchased and also helps in cost control for the received items.
4. Acknowledgment was improper due to the pending GRN (goods receiving notes) which leads to mismanagement of the goods received
Received items were individually acknowledged by the lab supervisor for all the section of the lab.

Implementation:

- Acknowledgement by the lab supervisor is done without any failure to keep the track on the items received
 - Centralised acknowledgment for the received items by the lab supervisor is done.
5. As the process was not followed properly by the staff, pending GRN or delay in the updating the items in the system leads to noncompliance to the consumption update.
Due to heavy workload and unavailability of the sufficient staff, delay or no update of the consumption.
The process of the consumption was done for the individual for all the sections of the lab.

Implementation:

- As the process was implemented properly, GRN was updated in HMIS therefore proper consumption update in the system was followed.
 - Centralised consumption update is implemented in the labs.
6. The internal audits were not performed on regular basis which leads to high variance in the stock, lack of audits leads to poor control and mismanagement in the lab.
Documentation for indenting and consumption were improper.

Implementation:

- Internal Audits on monthly basis are performed to improve the process and performance of the lab
- It helps to lower the variance in the lab and helps to control and manage the stock availability in the lab.

Conclusion

- Staff should be trained properly for their roles and responsibilities.
- Reorder level for the lab reagents should be set to achieve better inventory management.
- Process flow for indenting and consumption should follow for proper utilizations of the lab reagents.
- Equipment utilization should be follow to reduce the over consumption of the resources.

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