



Bhagwan Mahaveer
Cancer Hospital & Research Centre
(Managed By K.G. Kothari Memorial Trust)



A STUDY ON
DISCHARGE TURN AROUND TIME FOR THE IPD PATIENTS BY USING
SIX SIGMA APPROACH
at Bhagwan Mahaveer Cancer Hospital & Research Center

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INTRODUCTION

- Hospital discharge describes the point at which inpatient hospital care ends
- Hospital discharge is not an *end point*, but rather one of multiple transitions within the patient's care journey
- A Major problem is 'delayed discharge', where the patient remains in hospital because of the failure to appropriately co-ordinate care between agencies.
- This study is focused mainly on how long a patient has to wait for getting discharge from the hospital. In the study, I have concentrated on the time consumed at various levels of discharge procedure.

What is six sigma ?

- It is a methodology for continuous improvement. It is a set of statistical and other quality tools arranged in unique way. It is a way of knowing where you are and where you could be. It is a Quality Philosophy and a management technique.
- Today, the concepts and methodologies of 6-Sigma are increasingly being used in the healthcare industry for improving the quality of services rendered, increasing efficiency, and eliminating human errors that can often prove fatal

Benefits

- 6-Sigma focuses on improving processes rather than just concentrating on the task, which helps in increasing the scope of improvements. It provides the necessary tools and methodologies that help in analyzing and transforming human performance, necessary for achieving significant long-term improvements.

- **Why Six Sigma?**

Six Sigma is about practices that help you eliminate defects and always deliver products and services that meet (customer) patients specifications .

Six Sigma is for :

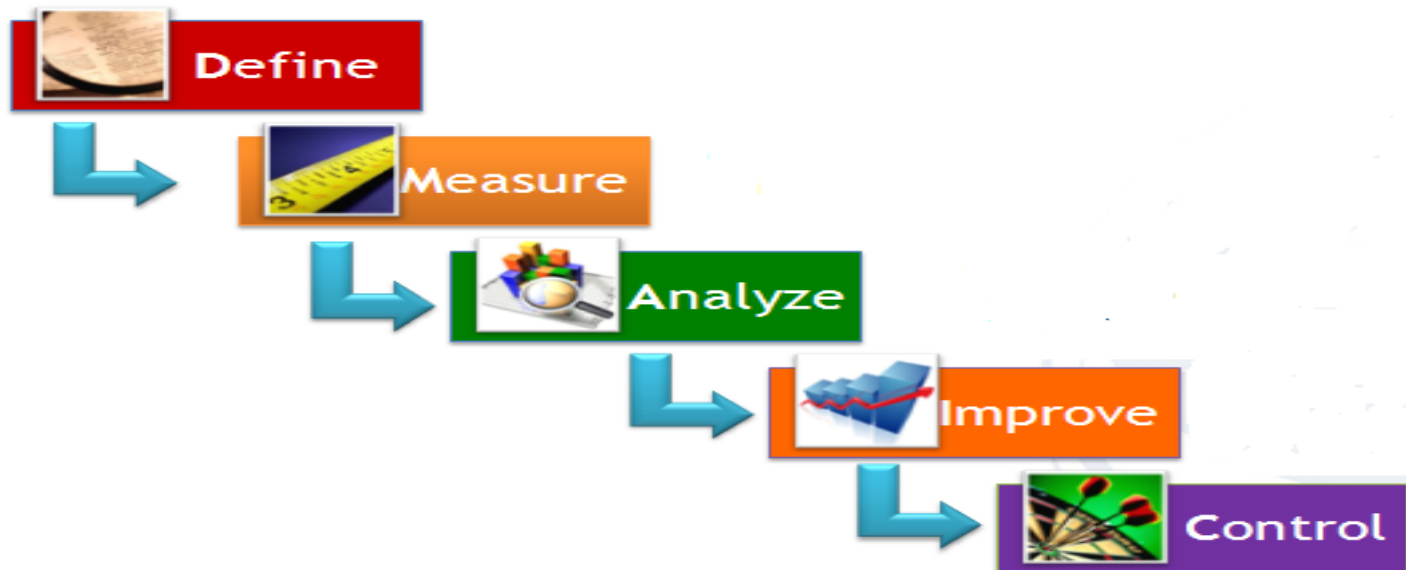
- (Customer) patient satisfaction
- Growth
- Quality Improvement
- Competitive Advantage
- Employee Pride

Methodology for Six Sigma

- Six Sigma projects follow two project methodologies inspired by [Deming's Plan-Do-Check-Act Cycle](#). These methodologies, composed of five phases each, bear the acronyms **DMAIC** and **DMADV**.
- **DMAIC** is used for projects aimed at improving an existing business and service process.
- **DMADV** is used for projects aimed at creating new product or process designs.
- Here , I have taken the DMAIC six sigma improvement methodology.

What is DMAIC ?

- A logical and structured approach to problem solving and process improvement.
- An continuous improvement process. A quality tool with focus on change management.



Aim :

To reduce Turnaround time of discharge patient in Bhagwan Mahaveer Cancer Hospital Jaipur.

Research Question:

Can TAT for discharge process be reduced by using six sigma approach?

HYPOTHESIS:-

H_0 :-TAT cannot be reduced.

H_A :-TAT can be reduced.

Objectives :

- 1) To study the current Discharge process
- 2) To determine the TAT in IPD.
- 3) To diagnose the reasons of delay and to find out the value-added and non-value added processes.
- 4) To implement interventions to reduce the TAT.
- 5) To carry out analysis of post intervention phase.



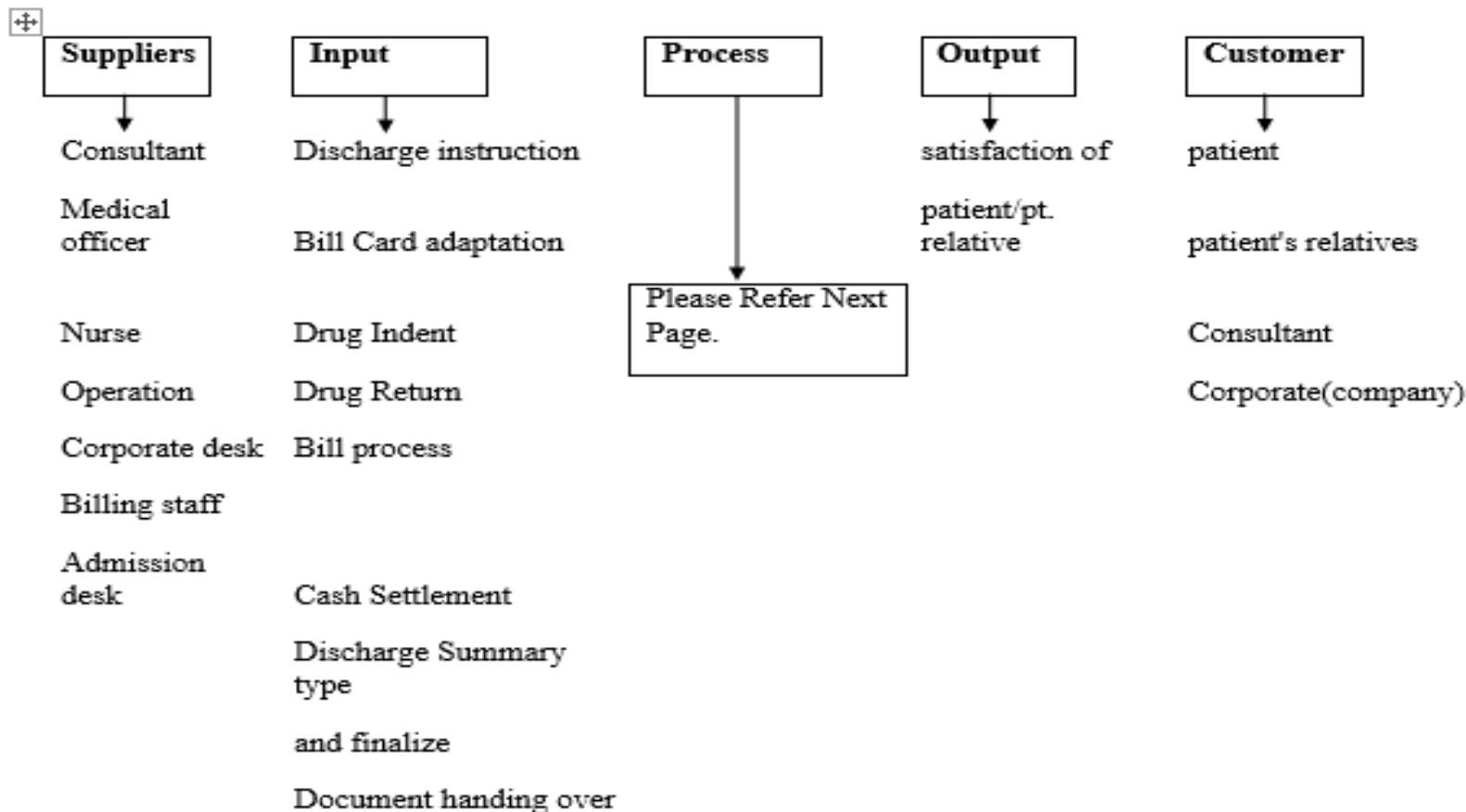
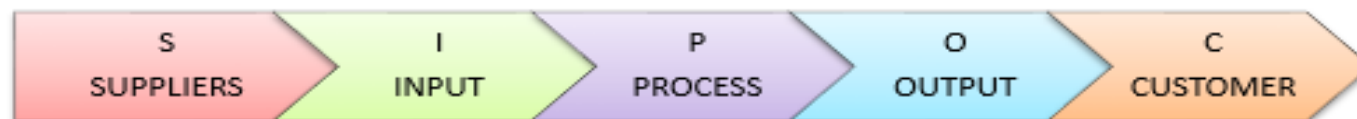
Methodology

- **Study Setting:** Superspeciality Cancer care Hospital, Jaipur
- **Study Period:** 01 April, 2017 to 31 April, 2017
- **Study Population:** IPD Patients
- **Study design:** Interventional study
- **Data collection method:** Primary Data collected through direct observation and secondary data is Retrospective.
- **Sample size:** 200 in control phase.
Inclusion criteria:-All IPD cases except daycare,ICU cases.
- **Data Analysis:** Data is analyzed by different data analysis tools like Fishbone diagram, Pareto chart, Histogram.

Tools for Six Sigma:

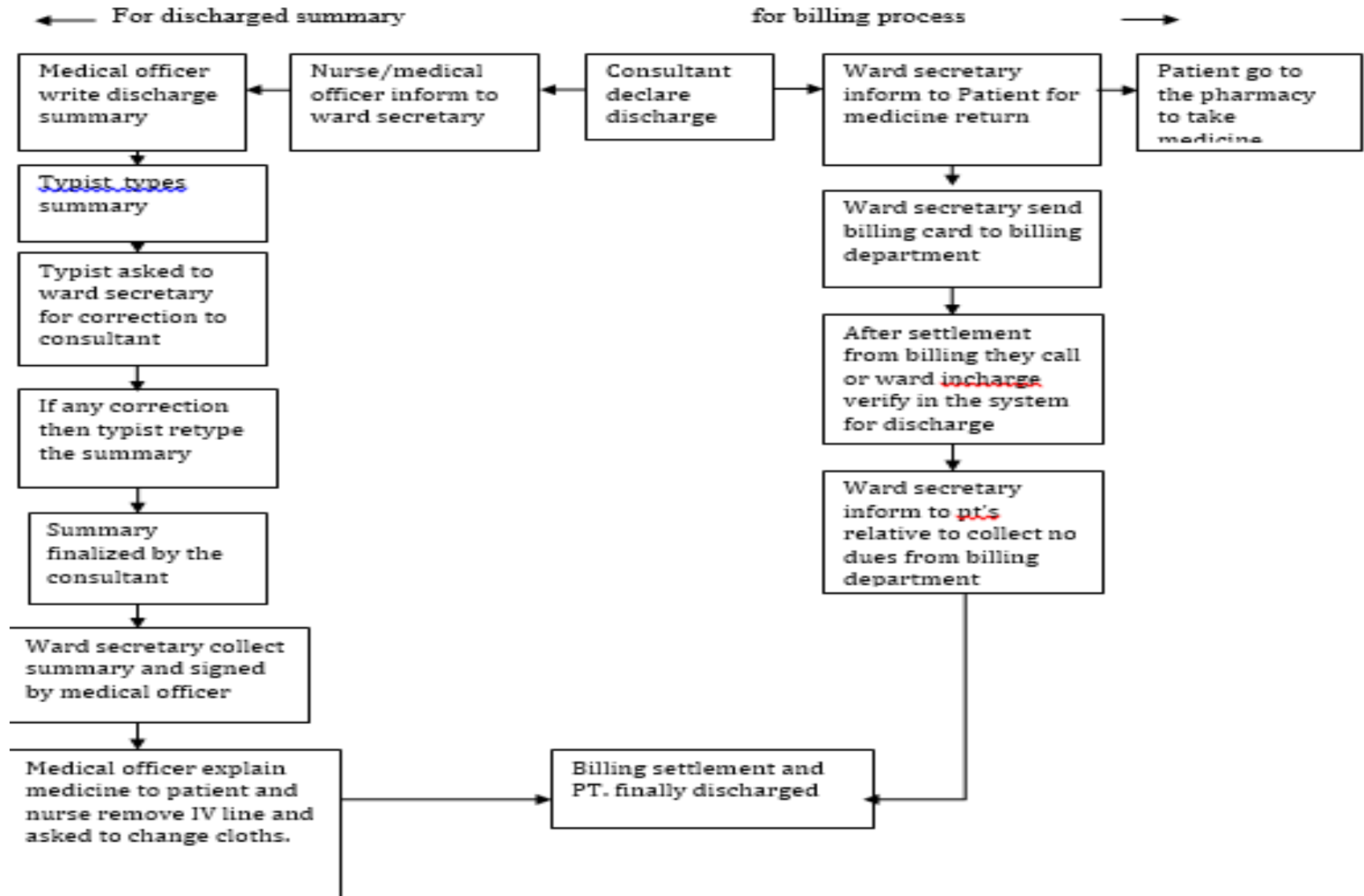
- Process Mapping
- Design of Experiment
- XY Matrix:
- Failure Mode Effect Analysis:
- Cause And Effect Diagram
- Pareto Chart
- Histogram

SIPOC



Discharge Process

The actual discharge process is shown as below.

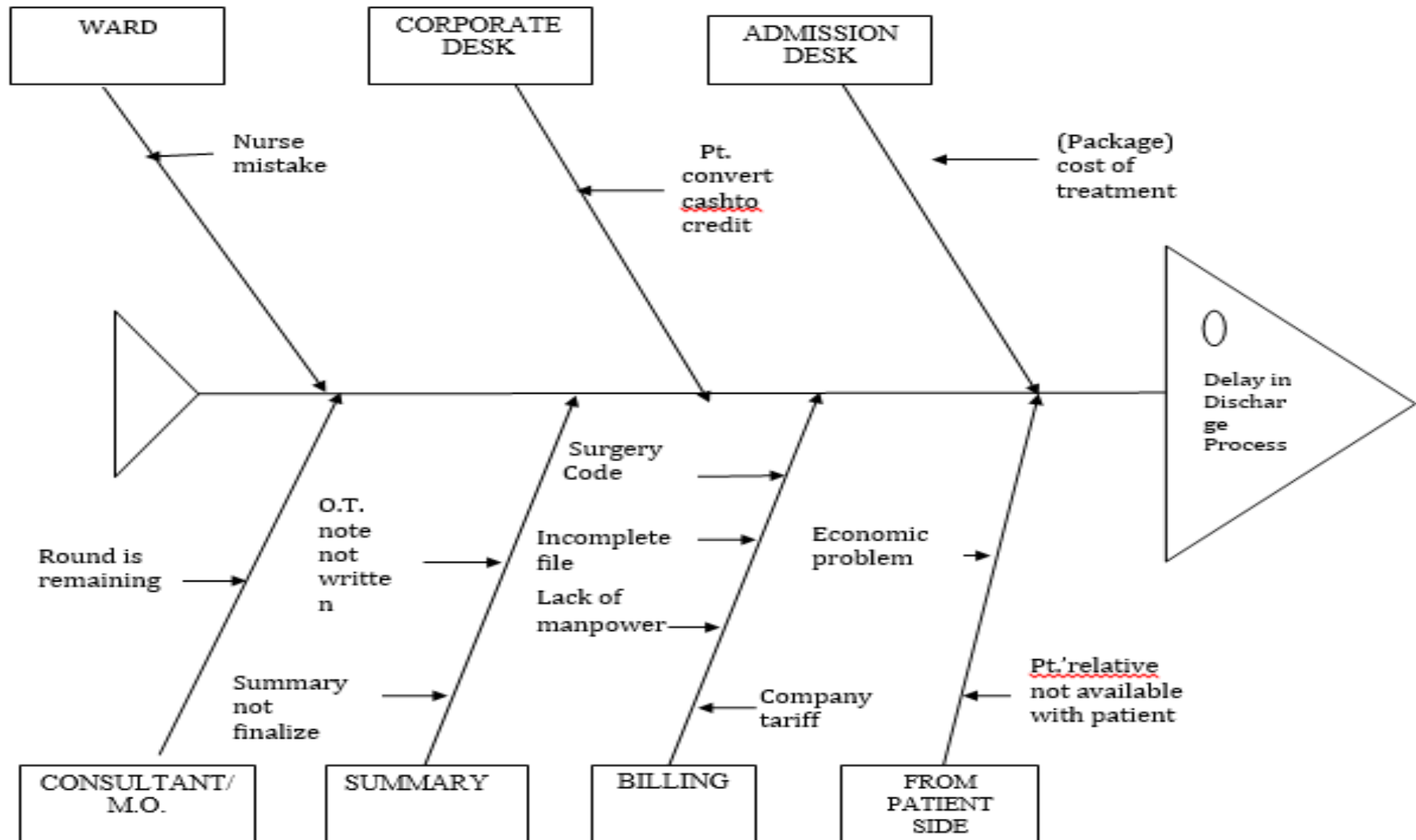


Format of Data Collection

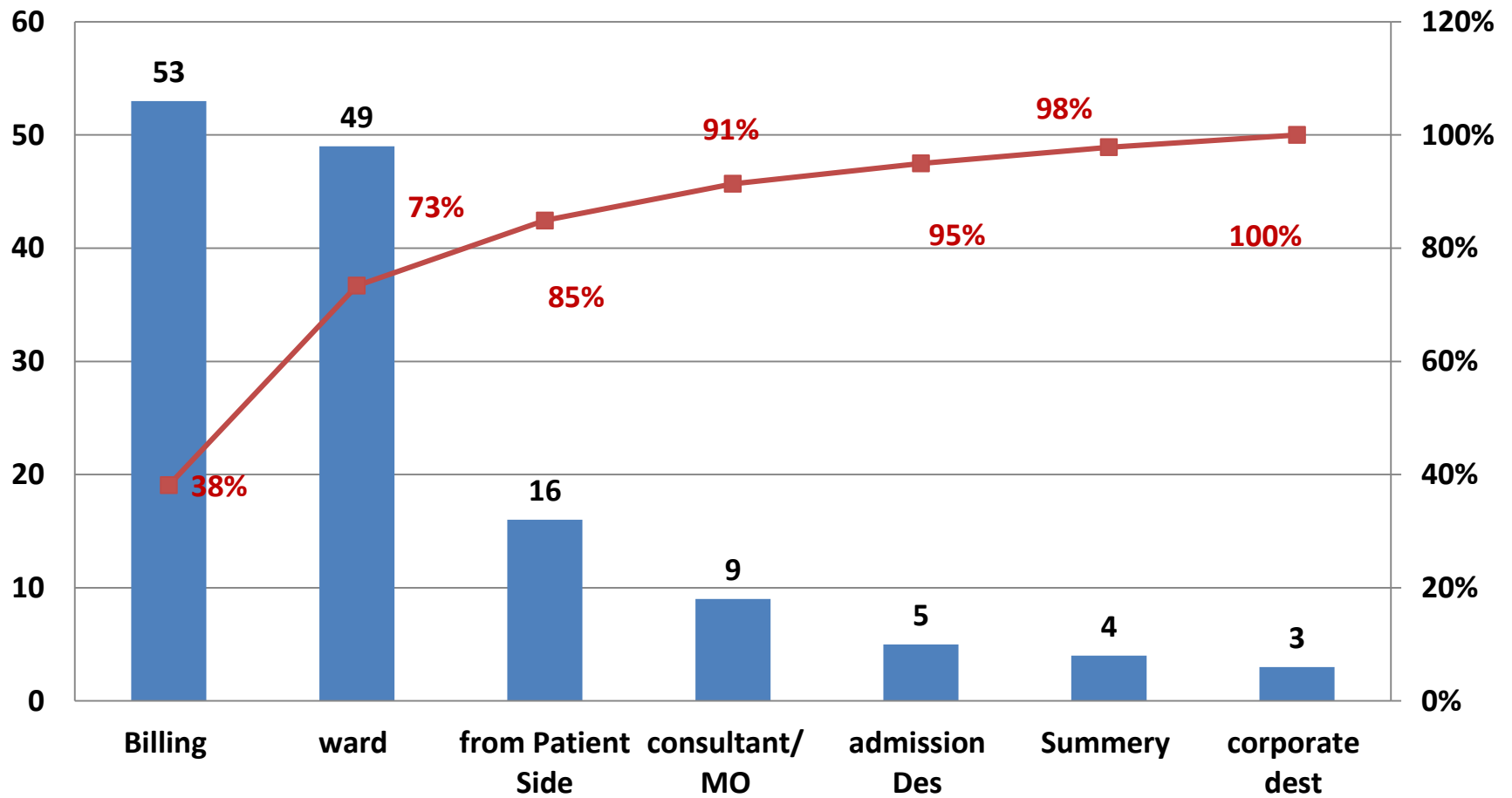
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ANALYSIS PHASE:

Fish Bone Diagram (Root Cause Analysis):



PARETO CHAT



OBSERVATIONS

Billing department

- **Incomplete files** – Failure of ward nurse to check all entries like sign, investigation report, seal stamps etc.
- There is a queue of attendants in billing department. Although there are specified counters, there is lack of manpower which leads to delay in discharge.
- Missing of medicine wrapper(above 1000) during discharge it leads to delay.
- **Company tariff** - For the corporate patients they have a company limit of 50000-100000 Rs. Sometimes, the bill may go beyond this limit for which the patient will have to adjust or has to issue another credit letter from company, causing delay in discharge.
- **Surgery code** – The consultant forgot to write the surgery code in the billing card so at the time of final settlement of billing, waiting for the consultant for asking the surgery code.

From patient side

- Patients have some economic problem.
- Patient attendant takes signed discharge paper from ward incharge before discharge for photocopy because patient needs that discharge paper for medicine and for next time permission.
- When ward incharge goes to the patient for informing the billing details, at that time patient's relative is not available with the patient.

At ward level

- Nurse mistake (they do not put the investigation reports in file on time and thus, discharge is delayed).
- Nurse mistake (they do not staple the strips/boxes of used medicines(above 1000)of empanelled patient in files on time or might get lost/displaced in shifting from one ward to another.
- Patient Care assistant not available at the time of discharge.
- Consultant and medical officer rounds don't happen on time.

Summary

- Summary is not finalized by consultant for discharge patient.
- The O.T. note is not written in the Operation Theater at the time of Operation. So, O.T. note remains pending which leads to delay in discharge.

Admission desk

At the time of admission according to Bed category the estimated cost will tell to the patient's relative but at the time of discharge due to some additional treatment or any complication the cost will be increased, so at that time some patients will dissatisfy and delay due to arrangement of money.

Corporate desk

- Sometimes when patients come in emergency, they don't have any authorization letter from the corporate company. Most of the times, the patient's relative is asked to collect and submit the authorization letter. The authorization letter may take time to come depending on the situation which eventually leads to a delay in discharge.

And the last step critical to quality, means the most dissatisfying area in the whole discharge process is

1. billing department
2. ward area
3. patient side.

Defect Analysis:

- DEFECT PER MILLION OPPORTUNITY:**

DPO = Total No. of Opportunity / Total No. of Unit * No. of Opportunity

$$\begin{aligned}\text{DPO} &= 139 / 200 * 7 \\ &= 0.0992857143\end{aligned}$$

DPMO = Total No. of Defects * 10,00,000

$$\begin{aligned}\text{DPMO} &= 0.0992857143 * 10,00,000 \\ &= 99285.71\end{aligned}$$

Sigma Level (Process Capability)	Defects per Million Opportunities
2	308,537
3	66,807
4	6,210
5	233
6	3.4

Defect (%) = 9.9

Yield (%) = 90.05

Process Sigma = 2.74

CONTROL PHASE

DEFECT PER MILLION OPPORTUNITY

$$\text{DPO} = 87 / 200 * 7 \\ = 0.062143$$

$$\text{DPMO} = 0.062143 * 1000000 \\ = 62143$$

Sigma Level (Process Capability)	Defects per Million Opportunities
2	308,537
3	66,807
4	6,210
5	233
6	3.4

$$\text{Defect (\%)} = 6.2$$

$$\text{Yield (\%)} = 93.76\%$$

$$\text{Process Sigma} = 3.03$$

So, here the defect is 6.2% , efficiency is 93.7% and sigma process is 3.03. Still it is not six sigma because for six sigma the yield must be 99.9997%.

RESULTS

PHASES	AVERAGE TIME	SIGMA
ANALYTIC PHASE	225	2.7
CONTROL PHASE	178	3.03

This intervention study demonstrate that six sigma tool is effective in reducing the turn around time of discharge process.

Thank You!

