

**PROACTIVE RISK ASSESSMENT OF
DISCHARGE PROCESS USING
PFMEA TOOL IN A MULTI-
SPECIALITY HOSPITAL IN SOUTH
INDIA**

**Presented by:
Dr Shalini
Dr Kanakavalli
AB/80**

INTRODUCTION

FMEA - Failure Mode and Effect Analysis is a prospective risk analysis/assessment tool. Its scope is widespread in many Areas such as military, aerospace, automobile, electricity, mechanical, semiconductor, healthcare and pharmaceutical industries.

It's applicable wherever the need of risk assessment is there.

DISCHARGE PROCESS in hospital can be simply defining where the patient hospital care ends. Well planned timely discharge is important to both hospital and as well as to the patient. In terms of better treatment and speedy recovery to the patient; and in terms of revenue generation and as well as the image to the hospital so that re-hospitalization will be avoided.

identify the potential failures

The **current study** was undertaken to **identify the potential failures** in hospital discharge process, its causes and its effects. Thus by prioritizing the Risk and take corrective measures to prevent further failures.

Discharge process in hospital is often neglected for risk analysis as it is a loosely coupled system. It's a complex system with multi stakeholder's involvement which makes it often difficult to process effectively if the standard measures aren't put under.

The discharge process carries utmost important in bed turnover rate, revenue generation of the hospital, patient satisfaction through discharge interview/survey etc.

OBJECTIVES

- To study the In-patient **Discharge process** and identify different stakeholders involved.
- **PROACTIVELY** assess the **RISK** involved in the discharge process.
- To assess **RPN** (Risk Priority Number) in discharge process, potential failures and its effects.

Location

The study was conducted in Multispecialty hospital in south India, which is known for its quality treatment. It is a 100 bedded multispecialty hospitals with patient centric care and NABH accredited. They have 11 branches all over India.

Period

Study was conducted for a period of 2 months
JAN' 2021 – FEB' 2021

Area

In patient department, Billing, Insurance, Laboratory, Radiology, Nursing and Administration department.

Team

A multidisciplinary team of 26 people of different specialties are selected to assess the risk in discharge process, as discharge process involves multi-stakeholders multi-disciplinary team required.

The team consists of ,Consultants(5),Nurses(6,)Physician assistant(4),Paramedics (2-rad,3-lab, 1-cath lab OT staff),Billing (4),Pharmacist(2).

Data collection method

- **Brainstorming session** with the multidisciplinary team.
- One to one brainstorming session with the team members
- Using high level discharge process chart and thought processing questionnaire.

Materials/tools used

1. Process flow chart
2. **PFMEA** tool
3. Thought processing questionnaire
4. **S-O-D** table (Severity-Occurrence-Detectability)
5. **RISK ASSESSMENT MATRIX (10 x 10) (RAM)**

Methodology

The study was conducted in 3 phases.

Phase I: Planning and Preparation.

Phase II: Commencement of study.

Phase III: Analysis, Result and Recommendation

THOUGHT PROCESSING QUESTIONNAIRE

Are you aware of hospital discharge process?

What is the primary purpose of discharge process in hospital? What's its importance?

What could go wrong (failure) in discharge process?

What has gone wrong with discharge process in the past?

What concerns do you have with discharge process?

What are the consequences of the failure in the discharge process? (internally-hospital, externally-in the society, to the end user-patient)

How can the failure occur?

What could cause the discharge process to fail?

What circumstances could cause the process to fail to perform its intended function?

Why it can occur?

What possibly in place that could possibly prevent the cause?

What is your idea on improving the existing discharge process?

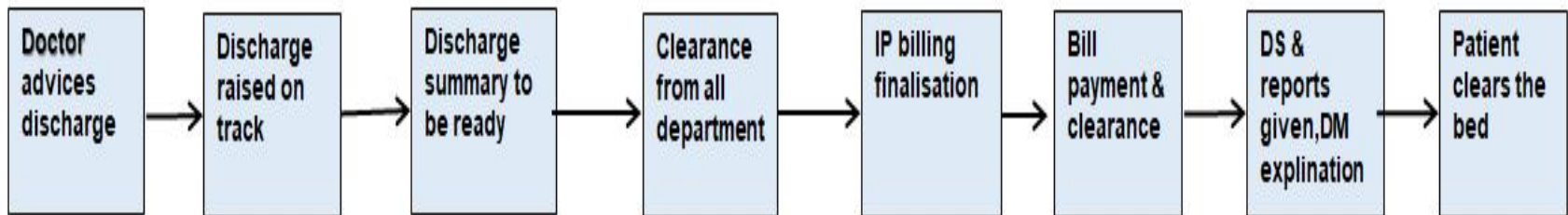
S-O-D TABLE

SEVERITY	RANK	OCCURRENCE	RANK	DETECTION	RANK
Hazardous without warning	10	Very high failure almost inevitable	10	Absolute uncertainty	10
Hazardous with warning	9	Very high failure almost inevitable	9	Very remote	9
Very high	8	High repeated failures	8	Remote	8
High	7	High repeated failures	7	Very low	7
Moderate	6	Moderate occasional failures	6	Low	6
Low	5	Moderate occasional failures	5	Moderate	5
Very low	4	Moderate occasional failures	4	Moderately high	4
Minor	3	Low relatively few failures	3	High	3
Very minor	2	Low relatively few failures	2	Very high	2
Negligible	1	Remote failures is unlikely	1	Almost certain	1

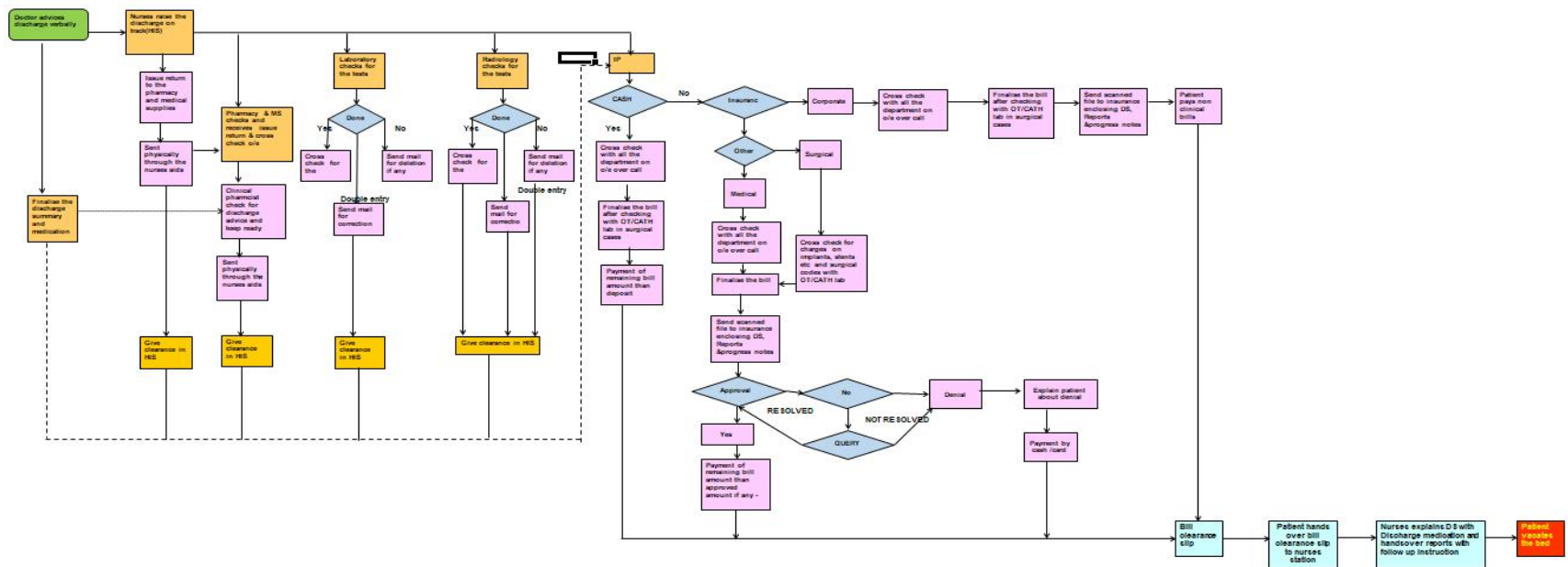
RESULTS AND DISCUSSION

(i) To study the In-patient discharge process and identify different stakeholders involved

HIGH LEVEL FLOW CHART-DISCHARGE PROCESS



DETAILED FLOW CHART- DISCHARGE PROCESS



(ii) To proactively assess the risks involved in the discharge process.

Verbal advice for discharge from consultant

- Delay in discharge advice
- Planned discharge can postpone
- Discharge against medical advice

Nurse raises the discharge on HIS

- Nurses are not alerted of discharge orders
- Discharge advice not communicated adequately
- Difficulty in traceability of discharge on track

Discharge summary to be finalized by medical officer /Consultant in charge

- Waiting for consultant advice

Clearance from nursing in HIS

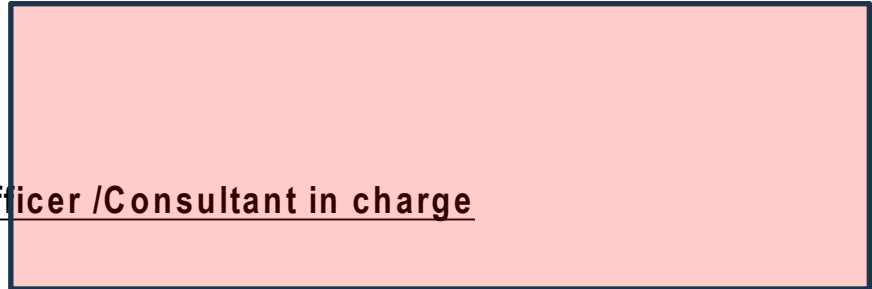
- Time consumed in issue return to pharmacy and medical supplies

Clearance from pharmacy and Medical supplies

- Delay in giving clearance
- Waiting for implant charges confirmation
- Delay in discharge medication initiation

Clearance from Laboratory

- Delay in laboratory clearance

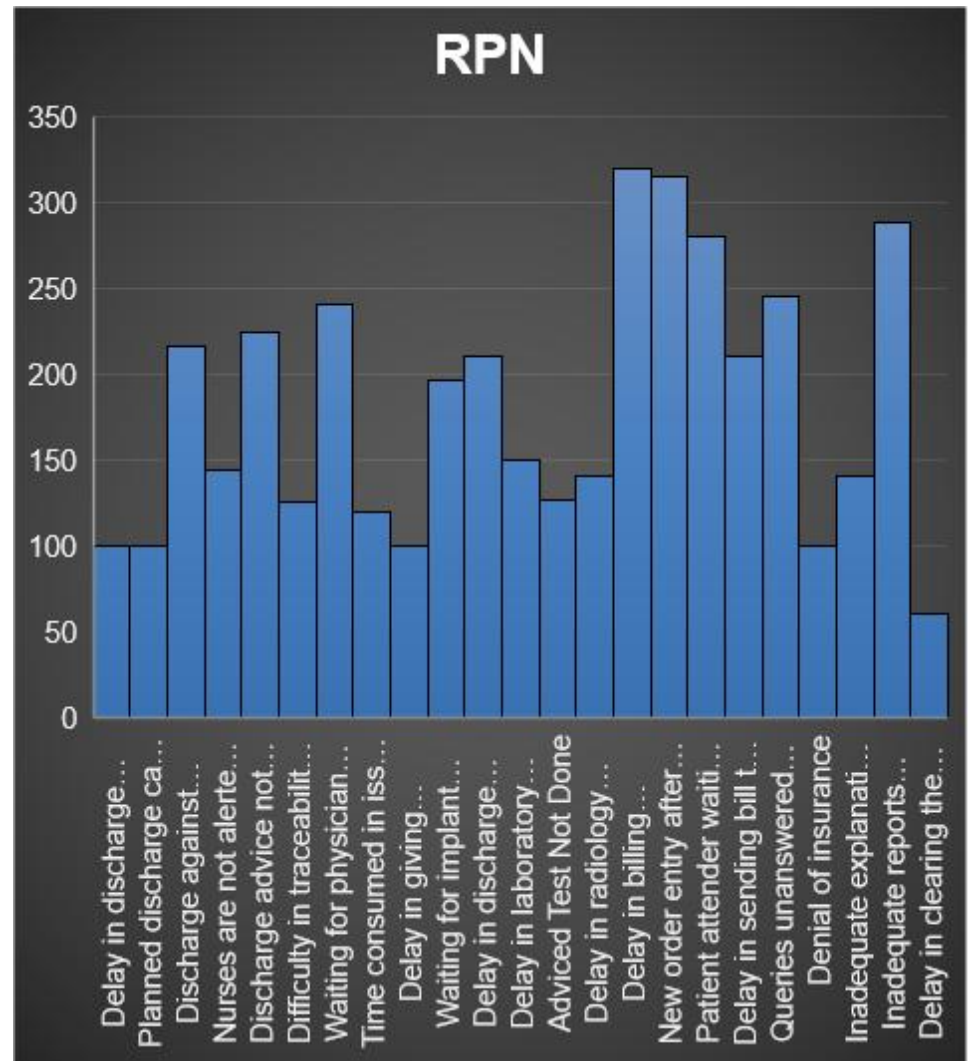


(iii) To assess the RPN in discharge process, potential failures and its effects

SL NO	FAILURE MODE	CAUSES	EFFECTS	PRESENT PROCESS CONTROL	S	O	D	RPN (SxOxD)	ACTIONS RECOMMENDED
Process step	Verbal advice for discharge from Consultant								
i	Delay in discharge advice	Physician in-charge got emergency call/OT, Occupied with Outpatients	Delay in discharge process, unsatisfied patient attenders		5	4	5	100	Proper planning between OP and IP timings
ii	Planned discharge can postpone	Due to unexpected deterioration in patient	Increased length of stay in hospital(ALOS)		5	5	4	100	
iii	Discharge against medical advice	Care planned inadequately, status quo of patient care, multiple, physician involved, communication gap between dr and nurse, patient & doctor, nurse & patient, cost affordability of patient	Unsatisfied patient and relatives, Brand image at stake Readmission of patients in case of patients deterioration, Patient life may be at stake		9	4	6	216	

Failure Modes

Delay in discharge advice	100
Planned discharge can postpone	100
Discharge against medical advice	216
Nurses are not alerted of discharge orders	144
Discharge advice not communicated adequately	224
Difficulty in traceability of discharge on track	125
Waiting for physician advice	240
Time consumed in issue return to pharmacy and medical supplies	120
Delay in giving clearance	100
Waiting for implant charges confirmation	196
Delay in discharge medication initiation	210
Delay in laboratory clearance	150
Advised Test Not Done	126
Delay in radiology clearance	140
Delay in billing finalisation	320
New order entry after finalising the bill which been	315
Patient attender waiting for negotiation of bill	280
Delay in sending bill to insurance	210
Queries unanswered on time	245
Denial of insurance	100
Inadequate explanation of discharge advice	140
Inadequate reports handed over-	288
Delay in clearing the bed	60



RISK ASSESSMENT MATRIX(RAM)

H
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H

SEVERITY

10	1. Denial of insurance 2. Inadequate explanations of discharge advice							
9			1. Discharge against medical advice	1. New order entry after finalising the bill which been communicated with patients attenders				
8						1. Patient attending negotiation of	Delay in billing finalizations	
7		1. Advised Test Not Done	1. Discharge advice not communicated adequately 2. Waiting for implant charges confirmation 3. Delay in radiology clearance			1. Queries unanswered on time in insurance		
6			1. Nurses are not alerted of discharge orders	1. Delay in laboratory clearance	1. Inadequate reports handed over- missing CDs and Images from Radiology, outsourced reports missing, ECG/ECHO/TROP I, images missed, OP/ER reports just before admission missed	1. Delay in discharge medication initiation 2. Delay in sending bill to insurance	1. Waiting for physician advice	
5			1. Delay in discharge advice 2. Time consumed in issue return to pharmacy and medical supplies	1. Planned discharge can postpone 2. Difficulty in traceability of discharge on track 3. Delay in giving clearance in pharmacy	1. Delay in clearing the bed			
4								
3								
2								
1								
	1	2	3	4	5	6	7	8

LOW

OCCURENCE

HIGH

DISCUSSION

The present study was conducted with the aim of proactive risk assessment of in-patient discharge process in multi-speciality hospital by using PFMEA.

Most of the studies done on in-patient discharge process were mainly on rehospitalisation, delay in discharge (Ishikawa diagram), TAT of discharge process etc.

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Original article

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Risk assessment of the hospital discharge process of high-risk patients with diabetes

Teresa A Pollack,¹ Vidhya Illuri,¹ Rebeca Khorzad,² Grazia Aleppo,¹
Diana Johnson Oakes,¹ Jane L Holl,² Amisha Wallia^{1,2}

RESEARCH ARTICLE

Open Access

Improving patient discharge and reducing hospital readmissions by using Intervention Mapping

Gijs Hesselink^{1*}, Marieke Zegers¹, Myrra Vernooij-Dassen^{1,2,3}, Paul Barach^{4,5,6}, Cor Kalkman⁴, Maria Flink^{7,8}, Gunnar Öhlén^{9,10}, Mariann Olsson^{7,8}, Susanne Bergenbrant¹¹, Carola Orrego¹², Rosa Suñol¹², Giulio Toccafondi¹³, Francesco Venneri¹³, Ewa Dudzik-Urbaniak¹⁴, Basia Kutryba¹⁴, Lisette Schoonhoven¹, Hub Wollersheim¹
and on behalf of the European HANDOVER Research Collaborative

RECOMMENDATIONS

PFMEA is a proactive risk assessment tool helped us in assessing the risks by identifying the potential failures in the existing discharge process, hence reengineer the process. **23 failures modes** were identified, and the following actions were recommended.

- **Efficient use of the existing process control**
- Effective **time management** for the OPD and IPD timing for visits for physicians
- Ward nurse/physician in charge to **follow up with the discharge process** effectively
- **Discharge summary** to be kept ready **90%** prior to the planned discharge day.
- **Reference doctors** to be signed off once they are done with their plan of actions; mentioning the medicine to be taken with time line and follow up time. In case if patient was kept for observation till evening, discharge to be kept on track once patient is stable.
- Allocation nurse/physician assistant/duty doctor to follow up with the **discharge medication** once advised
- **Planning of chute** in future for faster delivery to pharmacy and labs from wards

- A day prior to the planned discharge the **IP pharmacist** to alerted to cross check for any wrong/double entries and implant charges confirmation
- **Daily monitoring of the IP bill**, and in planned discharge one day prior planning of approximate billing regular financial counseling for the IP patients in long standing cases.
- **Separate financial counseling room** to avoid unnecessary disturbance to other patients. Automation in billing for few of the insurance, separate IP insurance billing personnel who can keep as stand by in case of less insurance discharges. Separate IP insurance personnel following up with all the queries and insurance bill. Separate IP insurance personnel following up with all the queries and insurance bill
- Physician assistant/duty doctors/allocated nurses to **explain in detail** about the care and medicine to be taken after discharge, diet and physiotherapy personnel to be present in case of cardiac, diabetic or lifestyle diseases cases.
- Nurses/physician assistant to **cross confirm the reports** to be handed over during discharge.

CONCLUSION

The study on discharge process of assessing Risk by using **PFMEA tool** has conducted for the period of 2 months in a 100 bedded multidisciplinary hospital in South India. **Multi-disciplinary team** has been involved in the study. The failure modes were identified in each process step; severity(S) is assessed in the scale of 1 to 10; 1 being the lowest and 10 being highest; same with the occurrence(O). Of each failure mode; the detectability(D) of each failure was assessed, where easily detectable is 1 and hard is 10.

Risk priority number ($RPN = S \times O \times D$) was calculated and plotted on 10×10 Risk matrix using (S×O). The process control if any existing has been identified to use it effectively and Actions been recommended to organisation to prevent further risks. FMEA tool helps in re-engineering of the existing process. Being in healthcare system it's essential to be error proof to save lives, FMEA such tool helps in identifying possible risks and prevent that further.

SUMMARY

The study was conducted in a **Multispecialty 100 bedded hospital** in south India. **Purpose of this study** is to identify the potential failures involved in discharge process and assess their causes and effects, there by preventing them from occurring, Using Process Failure Mode and Effects Analysis (PFMEA)tool.

JCI and as well as NABH standards recommends risk prioritization and assessment as quality protocol(FMEA) for hospital processes yearly for risk analysis as hospital cannot afford problem resolution once it occurred, better to have prevented before it occurs.

To understand the patient discharge process in the hospital, identify possible failures and their effects using FMEA analysis.

The study conducted in 3 phases

PHASE I: - Planning and preparation

PHASE II: - Study commencement

PHASE III: -Analysis, Results & Recommendation

A **total of 23 failure modes** been identified and been ranked in the scale of 1 to 10 based on the brainstorming session done on the multidisciplinary team and risk been identified and plotted on 10x10 risk matrix. 320 is the highest RPN and 60 is lowest RPN. Actions recommended to prevent the further risk.

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