Summer Training at
Shalby Hospital,
Ahmedabad

Six Sigma Approach to Reduce Error in Patient Shifting at Shalby Hospital

By
Rahul Prajapati

Under the guidance of
Dr. Anoop Khanna

MBA Hospital and Health Management
2015-2017

The IIHMR University, Jaipur
2016

INSTITUTE OF HEALTH MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

CERTIFICATE

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Rahul Prajapati** student of **MBA Hospital and Health Management** from the IIHMR University; Jaipur has undergone summer training at **Shalby Hospital, Ahmedabad** from 1st April to 31st May, 2016.

The candidate has successfully carried out the study designated to his during summer training and his approach to the study has been sincere, scientific & analytical.

The internship is in fulfilment of the course requirements.

I wish him all success in all his future endeavours.

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ACADEMY

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Date: 31st May 2016

Reference Number: SA/CER/13/2016

TO WHOM IT MAY CONCERN

This is to certify that **Mr Rahul Prajapati** S/O Mr. Charan Singh Prajapati has completed 02 (two) months (from 1st April 2016 to 31st May 2016) long **internship in Quality and Operations Department of Shalby Hospitals , S G Highway Ahmedabad.**

During the period of his Internship programme with us he was found punctual, hardworking and Inquisitive.

We wish him every success in Life.

Mr. Rohitash Chaube
HOD Shalby Academy

Acknowledgement

I,Rahul Prajapati like to express my sincere thanks to ShalbyHospital, for giving me an opportunity for working on the project and for extending all possible support and guidance required for successful completion of the project and valuable learning which came along with the entire process.

All this could not have been fruitful without contribution of various people to whom I would like to express my gratitude.

First of all, I would like to thank **Mr.Varun Mishra** and **Dr.Jasminebaldha** my guide and mentor at Shalby Hospital whose guidance and constructive feedback helped me improve quality of work to great extent.

I express my sincere gratitude to **Dr. NimishParikh, COO** and**Miss.Anamika Dave, HR Manager** at Shalby Hospital, who gave me chance to purpose my summer internship here and for their loving support throughout internship.

I extent my heartfelt gratitude to **Mr.Anoop Khanna**, **Professor**, Indian Institute of Health Management Research for mentoring me guiding me through this study. I am thankful to him for his invaluable assistance and cooperation.

Finally, a special thanks to all the supporting departments of Shalby Hospital for their assistance and for providing me relevant information that assisted me to accomplish successful completion of my project.

Rahul Prajapati

MBA (Hospital Management)

DECLARATION

I, Rahul Prajapati hereby declare that the project work titled '**Six Sigma Approach to reduce error in patient shifting at Shalby hospital.**' submitted in the partial fulfillment of the requirement for the 2nd year of MBA-Hospital Management, is a work done by me under guidance of our department faculty and Hospital authorities. This project is only and only STUDY purpose, not for publication or any other means. Use of any content of this project without permission of authorities will be considered illegal and actionable.

Rahul Prajapati

MBA-HM

Table of Content

ABBREVATIONS/ACRONYMES

- CCU-Cardiac Care Unit
- CSSD-Central Sterile Supply Department
- CTVS-Cardio Thoracic Vascular Surgery
- ER-Emergency Rooms
- ENT-Ear Nose Throat
- F & B – Food and Beverage
- FD-Facility Director
- GI-Gastrointestinal
- GE-Gastroenterology
- HMIS-Hospital Management & Information System
- HOD- Head of Department
- HR-Human Resource
- IT-Information Technology
- IPD-In Patient Department
- LDR-Labour and Deliver
- MOD-Manager on Duty
- MS-Medical Superintendent
- MICU-Medical Intensive Care Unit
- MRD-Medical Records Department
- OT-Operation Theater
- OPD-Out Patient Department
- QA-Quality Assurance
- SH-Shalby Hospitals
- SICU-Surgical Intensive Care Unit
- USG-Ultrasound

PREFACE

Summer training is an integral part of the MBA hospital and health management program.As a part of the curriculum, each student of the first year is required to undergo two months field training at reputed organizations to get depth exposure of various departments in the organization and better understanding of health care delivery system and its functions.

The major objectives of summer training are as follows:

a) To understand and learn day to day micro-level operational management of a hospital organization in the field of health.
b) To study identified issues/problems associated with some specific operational area/programmes.
c) To acquire more knowledge on role and responsibility of key player and stakeholders in the hospital. To understand various functions in hospital by introduction with key stakeholders, policy makers and researchers.
d) To work on project/task assigned by summer training organizations.

During the training period I had an **Overview of various departments of the hospital**. I also carried out studies on '**Six sigma approach to reduce error in patient shifting at Shalby hospital'.**

About Summer Training

MBA in Hospital management of Indian Institute of Health Management Research aims at preparing professionally trained managers of healthcare organization to meet the increasing need for managerial skills; it involves eight week summer training for the first year student to provide them firsthand experience of hospital environment.

As a part of this programme, I had the privilege to undergo my summer training at the Shalby Hospitals,Ahmedabad to get a firsthand knowledge and experience about the functioning of the hospital.I worked through under the Hospital Operations Management Department and Quality Department from 1st April to 31st May.

Objectives

The training program had the following objectives:

a) To have a basic orientation of the hospital set up.
b) The study of functioning of the hospital as a system and its department as a subsystem of the hospitals.
c) To observe all the departments in terms of their location, work plan and staffing pattern.
d) To study about the staffing pattern and job responsibility of staff.
e) Doing a project which is helpful to me in understanding hospital working in better way and to the organization.

Methods of Data Collection

The data collected was primary data and secondary data.

Primary data was collected by

- Personal observation during the summer training and department visits.
- Further information was gathered by discussion with the department head and head of staff on the basis of unstructured interview.

Secondary data was collected from

- The past records and hospital management information system(HMIS).

An Observational learning in Hospital

Hospital Profile

Shalby is the leading multi-speciality tertiary care healthcare institutions in Western India. We provide world class treatment for all types of diseases at the most affordable rates. Patients come from all over India and the world for treatment in Shalby Hospitals.

Modest Beginning: Shalby began its journey as a Joint Replacement Centre in 1994 by Dr.Vikram Shah. It has made tremendous progress in this field, as can be seen by the fact that **the highest number of joint replacement surgeries done in a single hospital anywhere in the world are done in Shalby Hospitals' S G Road, Ahmedabad Unit [Main Branch]**. Till date, over 40,000 joint replacement surgeries of different types have been done by the in house surgeons of Shalby Hospitals.

Quality: We render the best patient care through a professional approach. We believe in continual improvements in quality of our services. We implement quality improvement programs across all the departments of our hospitals with the aim of offering the best services to our patients.

The quality of our healthcare services has been certified by accreditations bodies like the **NABH, NABL and ISO 9001:2008** and recognised by most prestigious awards like the **Rajiv Gandhi National Quality Award**, the **FICCI award** and many more.

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Dental Cosmetic &Implant ology Centre: Shalby's 'Dental Cosmetic and Implantology Centre' established in 1995 is a state of the art unit in the field of dental implants and all other comprehensive dental treatments. It offers world class dental care in all aspects of dentistry. People from all over the world regularly visit Shalby's dental clinic for high end procedures, especially dental implants.

Expansion: Shalby now has multi-speciality hospitals in Ghuma [Ahmedabad], Vapi [Gujarat] and Mapusa [Goa]. The 30 bed hospital where Shalby began now houses a state of the art Assisted Reproductive Technologies [IVF] centre.

Shalby offers OPD services in all major cities of India like Mumbai, Delhi, Kolkata, Surat, Vadodara, Jaipur, Jodhpur, Indore and in African countries like Kenya [Nairobi].

Future-It is the vision of Shalby to continually improve and grow and fulfill its mission **'TO PRESERVE AND SUSTAIN QUALITY HUMAN LIFE'.**

Chairman's Message

Our objective is to provide high quality healthcare to people across the world. We aim to improve the quality of life of patients through compassion and dedication. We are geared to offer the best of healthcare services at competitive costs to people from across the globe. We are proud to have put Ahmedabad on the medical tourism map.

Vision

To be among the best Joint Replacement centers of the world, and a preferred medical institution for treatment of Cardiac, Spine, Oncology, Trauma and other medical conditions through world class technology, human expertise and highest professional standards at competitive costs.

Mission

To preserve and sustain quality human life as humanely as it can be done through painless processes, facilitation of speedy recovery, and indigenization of medical technology and to promote wellness & awareness through best practices at the highest value for all concerned.

Department in ShalbyHospital

Arthroscopy	Neuro surgery
Bariatric Surgery	Nephrology
Cardiology	Nutritional diet
Cardio thoracic Surgery	Orthopaedics
Critical care	Oncology
Cosmetic surgery & cosmetology	Onco surgery
Dental science	Ophthalmology
Dermatology	Pain clinic
Diabetology	Pathology
Eyes, Nose & Throat surgery	Physiotherapy
Endoscopy & Laparoscopy	Pulmonology
Kidney transplant	Plastic surgery
General surgery	Gynaecology & obstetrics
Gastroenterology	Rheumatology
G.I. Surgery	Radiology
Joint Replacement surgery	Spine surgery
Internal medicine	Trauma surgery
Infectious disease	Urology
Minimal invasive surgery	Vascular surgery
Neurology	

AUXILIARY SERVICES

- Ambulance Services
- Emergency Services
- Health check-up service
- CSSD
- Linen Services
- Stores
- Medical gases
- Security
- Kitchen & Cafeteria
- Bio-medical Engineering
- Maintenance& Engineering
- Mortuary services
- Medical Record Department
- Administrative Services
- Hospital Management Information system
- Clinical Research
- Bio-medical Waste Management
- Hospital infection control
- Pharmacy

LAYOUT OF HOSPITAL

VIP Lounge, Library, Doctor's lounge, Clinical Research room, Kitchen, Cafeteria, Cosmetic OPD	9th floor
Twin Deluxe Room	8th floor
VIP suite, Deluxe Room	7th floor
Premiere Rooms	6th floor
AC twin Room, Economic Room	5th floor
Twin room, Cafeteria	4th floor
OT,MICU,OPD	3rd floor
Corporate Block ,CSSD	L floor
OT,SICU	2nd floor
OPD,CCU, Cath lab	1st floor
Ortho OPD, Dental OPD, Reception, Admissions, Med claim ,OP pharmacy, Prayer room, Billing, Corporate help desk, Travel desk, Cafeteria, Ophthalmology OPD, other OPD	Ground floor
ER room, X-ray, Sonography, CT scan ,Mammography, MRI, Pathology, Health check-up, Dialysis, ER Billing	Basement 1
Bio-medical engineering, Mortuary, Medical Records department, Linen Store, General store, IPD pharmacy	Basement 2

SPECIFIC PROJECT:

Six Sigma Approach to reduce error in patient shifting at Shalby hospital.

Executive Summary

During an episode of disease or period of care, a patient can potentially be treated by a number of health-care practitioners and specialists in multiple settings, including primary care, specialized outpatient care, emergency care, surgical care, intensive care, and rehabilitation. Additionally, patients will often move between areas of diagnosis, treatment, and care on a regular basis and may encounter three shifts of staff each day—introducing a safety risk to the patient at each interval.

The hand-over (or hand-off) communication between units and between and amongst care teams might not include all the essential information, or information may be misunderstood.

These gaps in communication and incomplete information can cause serious breakdowns in the continuity of care and inappropriate treatment. Inadequate patient shifting can also cause a potential harm to the patient. But due to lack of training and lack responsibility most error reported at Shalby hospital.

This project reports the result of a six sigma study to reduce the error of patient shifting at shalby hospital. Incomplete information in patient transfer sheet and improper use of safety belt and side rails are described and six sigma level for the same determined.

With the help of NABH (National Accreditation Board) standards, we conducted a audit survey at Shalby Hospital. Data indicated that fill out of patient shifting form and precaution during patient shifting is critical.

The most critical parameters are identified as below.

1. Infection status of patient whether they required single room or isolation, not mentioned in patient transfer sheet.
2. Incomplete information fills out in patient transfer sheet and patient condition, monitoring isn't done.
3. Side rails and safety belt isn't used while patient transfer.

Detailed improvement actions to reduce the errors were identified. Appropriate procedures documented and implemented.

INTRODUCTION

OVERVIEW OF PROJECT:

This report contains a study to enhance the level of patient safety during patient shifting and effectivecommunication with patient.

Appropriateness, accuracy in patient monitoring and reducing error using the six sigma technique.

Currently most error include incomplete information fill out in patient transfer sheet that is time, date, patient infection status and signature of medical officer.

Research Methodology

Study Design: Cross Sectional Observational Study

Setting: Shalby Hospital,Ahmedabad

Duration of Study: 2 month

Sample Size: 35

Sampling Technique: Simple Random Sampling

Data Source: Personal Observation, discussion with department head and past and current records.

Define Phase:

Project Objective:

The objective of this project is to implement a safe patient shifting and develop an effective communication between patient and healthcare provider at shalby hospital.

Project Scope:

The scope of the project includes the activities listed as below.

- Determine the patient safety during patient shifting.
- Determine the better communication between patient and health care provider.
- Determine the use of side rails and safety belt.
- Determine monitoring of patient during patient transfer.

Project Plan:

- Prepare an audit checklist for patient shifting criteria.
- Conduct audit.
- Calculate the defects.
- Prepare pareto analysis.
- Calculate sigma level.
- Find out root cause analysis of the high impact causes.
- Implement the recommendation of the project.
- Prepare pareto chart and calculate sigma level again to check improvement.

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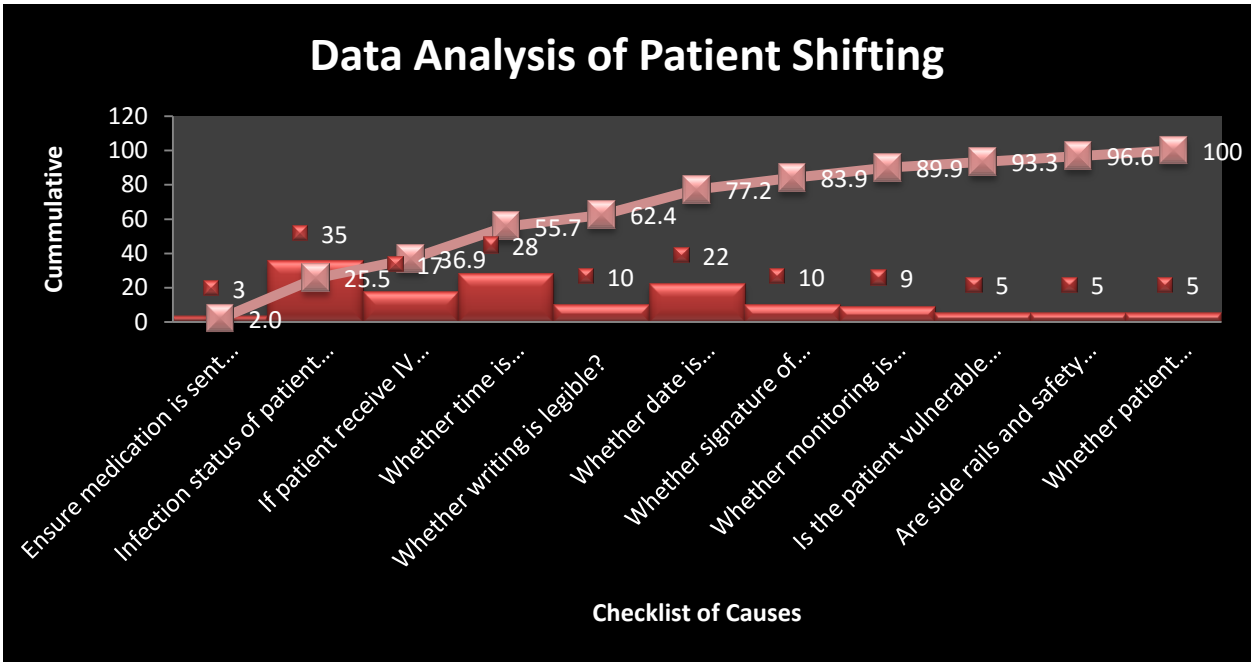
Measure Phase: (Data Sheet: Annexure-1)

Pareto Analysis:

On the above data we draw Pareto Chart to determine the high impact defects.



Most important issues are-

- Infection status of patient including whether they require single room or isolation not mentioned in transfer sheet.
- Information of patients who received IV fluids, and indication of the rate the pump should be set at is not mentioned in transfer sheet.
- Time is not mentioned in transfer sheet.
- Handwriting is not legible in many transfer form.
- Medical officer's signature isn't present in the form.
- Side rails and safety belt isn't used during patient transfer.
- Patient condition isn't monitored and recorded during transfer.

Sigma Calculation:

Total Number of parameters=14

Total number of defects observed=149

Total number of parameters in which error observed=11

Total number of error in parameters=Total number of parameters * Total number of parameters in which error observed=11 * 14 = 154

The Defects per unit (DPU): Total number of error observed/ Total number of error in parameters = 149/154=0.7602

The Defects per opportunity (DPO): 149/196*1/14=0.054278

The Defects per million opportunities: DPOX10^6=0.054278*10^6=54278

Yield= e^{-m}=$e^{-0.05}$=0.9512

Percentage yield is =**95.12%**

As per the ppm and sigma standard table the process sigma is with 1.5 sigma shifted distributions= **1.7**

Sigma (σ) level of the process is = 1.7

Analyze Phase:

Analysis for most critical parameter:

The following causes have been analyzed which further trigger for appropriate action plan.

1. Infection status of patient including whether they required single room or isolation not mentioned?

Reason:

- Criteria not mentioned in transfer sheet.

2. Time and date is not mentioned?

Reason:

- Not aware about to fill out this information.
- Not willing to fill out this information.
- Staff doesn't have time.

3. If patient receive IV fluids, please indicate the rate the pump should be set at?

Reason:

- Transfer sheet doesn't have enough space to fill out this information.
- Sometimes patient don't require IV fluids.

4. Signature of Medical officer isn't there on form?

Reason:

- Medical officer not take responsibility for this.
- Blaming other staff.

5.Side rails and safety belt is not being used?

Reason:

- Sometime side rails not available.
- Some rooms have small size of entrance so side rails cannot be used while patient is transfer.
- Sometime attendant staff is not willing to use side rails and safety belts.

Improve Phase:

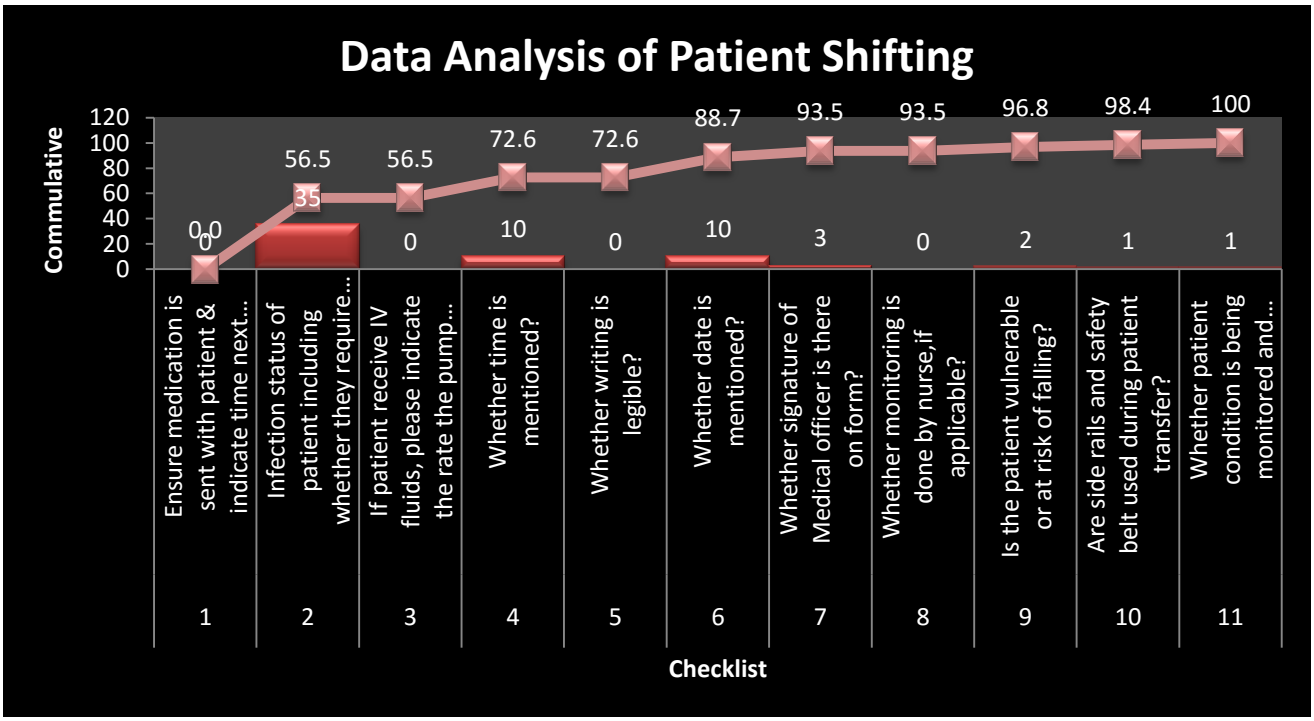
Recommendations:

1. Arrange a training session for patient care facilitator for below safe practice.
    - Use of safety belt and side rails
    - Patient monitoring
    - Fill out the transfer sheet correctly and properly.
2. Update in patient transfer sheet.
    - Infection status criteria must be mentioned.
    - Provide sufficient space to fill out sheet.

Pareto Analysis: -

After immediate implementation of recommendation, data for reduction in errors collected and analysed

On the above data we draw Pareto Chart to determine the high impact defects.



- ✓ Number of error has been reduced in patient shifting.
- ✓ Attendent has been started use of side rails and safety belt during patient shifting.
- ✓ Transfer sheet has been filled out completely.

Calculation Of Sigma Level(Improve Phase):

Total Number of checklist=14

Total number of error observed=62

Total number of parameters in which error observed=11

Total number of error in all parameters=Total number of parameters * Total number of parameters in which error observed=11 * 14 = 154

The Defects per unit (DPU): Total number of error observed/ Total number of error in parameters = 62/154=0.4025

The Defects per opportunity (DPO): 62/196*1/14=0.3163*0.07142=0.022397

The Defects per million opportunities:DPOX10^6=0.022397*10^6=22397

Yield= e^{-m}=$e^{-0.02}$=0.9801

Percentage yield is =**98.01%**

As per the ppm and sigma standard table the process sigma is with 1.5 sigma shifted distributions= **1.9**

Sigma (σ) level of the process is = 1.9

Checklist

Checklist For Patient Shifting

Checklist	Yes/No/NA	Remark/Comment
1. Whether form of patient shifting is in the file?		
2. Ensure medication is sent with patient & indicate time next medication is due?		
3. Infection status of patient including whether they require single room or isolation?		
4. If patient receive IV fluids, please indicate the rate the pump should be set at?		
5. Whether transfer form is used, if applicable?		
6. Whether time is mentioned?		
7. Whether writing is legible?		
8. Whether date is mentioned?		
9. Whether signature of Medical officer is there on form?		
10. Whether monitoring is done by nurse, if applicable?		
11. Has the next of kin been informed of the reason for transfer been fully explained to them?		
12. Is the patient vulnerable or at risk of falling?		
13. Are side rails and safety belt used during patient transfer?		
14. Whether patient condition is being monitored and recorded during transfer?		

Conclusions:

Patient shifting at shalby Hospital is now improved. The attendant staff started takes precaution towards patient shifting. Use of safety belt and side rails has beenincreased and because of that vulnerability among patient has been reduced .Monitoring of patient is improved and level of patient satisfaction increased. The necessary updation in patient transfer sheet has been implemented. Transfer sheet has been filled out completely and properly.

Although the change in sigma level of process is 0.22 (1.7 - 1.9) but the yield of process has increased by 2.89% (98.01% - 95.12%), resulted in reduction in error from 54278 to 22397.

Thus keeping the above improvement in view we can expect further improvement in the process with more training sessions followed by continuous audits.

Limitation:

All the critical few of the process were identified and rectified, which resulted in a slight improvement in sigma level of the process, but to get the real improvement in the process, continuous training for at least 6 months needs to be imparted and then sigma level of the process has be recalculated and reviewed.

Data collected for analysis also limits the scope of project; hence to look further process improvement, data for at least 6 months needs to be collected.

References:

www.who.int/solution/ps-solution.htm

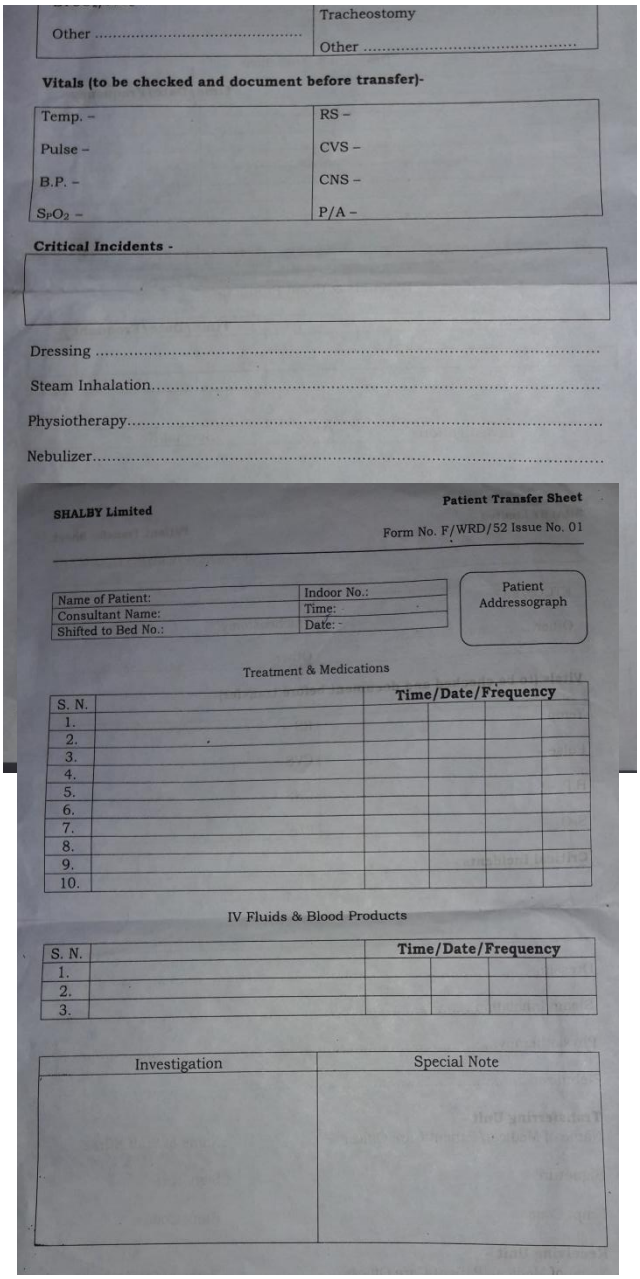
http://ama.com.au/clinical_handover_0.htm

FMS- NABH implementation guide book

ANNEXURE:

Training Session of Attendant :

Sample Patient transfer sheet:



Other	Tracheostomy Other .....

Vitals (to be checked and document before transfer)-

Temp. –	RS –
Pulse –	CVS –
B.P. –	CNS –
S_pO_2 –	P/A –

Critical Incidents -

Dressing .....

Steam Inhalation.....

Physiotherapy.....

Nebulizer.....

SHALBY Limited

Patient Transfer Sheet

Form No. F/WRD/52 Issue No. 01

Name of Patient:	Indoor No.:
Consultant Name:	Time:
Shifted to Bed No.:	Date: -

Patient Addressograph

Treatment & Medications

S. N.		Time/Date/Frequency			
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

IV Fluids & Blood Products

S. N.		Time/Date/Frequency			
1.					
2.					
3.					

Investigation	Special Note