

**Summer Training at
Narayana Multi-Specialty Hospital, Hyderabad
(April 1–May 31, 2014)**

**A Clinical Audit of Assessment of Morbidity Due to Stroke at Narayana
Multi-Speciality Hospital, Hyderabad**

**By
Pranita G Bhandakkar**

**Under the guidance of
Dr. J.P. Singh**

**MBA- Hospital & Health Management (MBA-HM)
2013-2015**



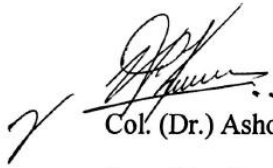
**The IIHMR University, Jaipur
2014**

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CERTIFICATE

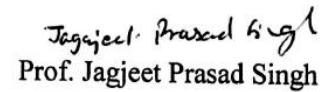
This is to certify that **Dr. Pranita G Bhandakkar** has undergone her summer training in **Narayana Multi-Specialty Hospital, Hyderabad** from 1st April, 2014 to 31st May, 2014. The candidate herself carried out all the studies related to her summer training. Her approach to the study has been scientific and analytical. This summer training is partial fulfilment of course requirement is recommended for the award of post graduate diploma in hospital management. I wish her success in all her future endeavours.



Col. (Dr.) Ashok Kaushik

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IIHMR Jaipur



Prof. Jagjeet Prasad Singh

Assistant Professor

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TO WHOM IT MAY COCERN

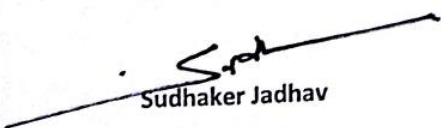
This is to certify that Dr.Pranita Ganpatrao Bhandakkar, pursuing her MBA in Healthcare from Indian Institute of Health management Research, Jaipur has successfully completed her 2 months internship in Quality department at Narayana Multispecialty Hospital from 1st April 2014 to 31st May 2014.

During her period of internship she has worked and completed the following projects:

- A study on 1st case delay in Operation Theatre at Narayana Multispecialty hospital.
- A Clinical Audit of Assessment of morbidity of Stroke at Narayana Multispecialty hospital.
- Audit of Central line infection Control rate less than 5% by 2 weeks Narayana Multispecialty hospital.

During this period she was found punctual, hard working and inquisitive. We wish her success for all her future endeavors.

With Best Regards,


Sudhaker Jadhav
Facility Director,
Narayana Multispecialty hospital,



Narayana Hrudayalaya Pvt. Ltd.
NH Malla Reddy Narayana

Acknowledgement

At the onset of the report I would like to express my special gratitude and appreciation Dr Sudhker Jadhav, Facility Director, NH hospital for allowing me to pursue my summer internship from Narayana Multi-specialty Hospital, Hyderabad.

I am highly indebted towards my guide Dr. Deepthi P, Senior Executive Quality, for her guidance and constant training as well as for providing necessary information regarding the project despite of her pre-occupation and busy schedule and her support in completing the project.

This training wouldn't have been completed without a substantial support from Dr. Ryan Savio Barreto, Manager Medical Services, whose kind co-operation and constant encouragement helped me in completion of the projects at the hospital.

Also I would sincerely like to express my gratitude towards a great number of people and would like to thank all the consultants in various departments and other staff members at Narayana Multi-specialty Hospital for being so helpful all the time and making this summer training project an unforgettable experience.

I express my respectful regards and special gratitude to my mentor Assistant Prof. Jagjeet. Prasad Singh, IHMR, Jaipur for his able guidance and useful suggestions, which helped me in completing the project work.

A special thanks to Dr Vijay Pratap Raghuvanshi for guiding me throughout my training and answering any queries that came along the way. I would also like to thank my institution and faculty members without whom this project would have been a distant reality.

Finally, and most importantly, I would like to thank God for allowing me to complete my project, my beloved parents, friends for their blessings and my special thanks goes to my dear friend Parag Mohite for his constant support, encouragement and wishes for the successful completion of this training.

Dr. Pranita Ganpatrao Bhandakkar
IHMR, Jaipur

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ABBREVIATIONS:

WHO - World Health Organization

GCS – Glasgow Coma Scale

NIHSS – National Institute of Health Stroke Scale

ASPECTS - Alberta Stroke Program Early CT score

MRS –Modified rankin Score

TIA- Transient Ischemic attack

CRHD- Chronic Rheumatic Heart Disease

DVT – Deep venous Thrombosis

PTs - Patients

HOSPITAL PROFILE:



Narayana Health (Kannada: formerly known as NarayanaHrudyalaya, is a multi-specialty hospital chain in India, headquartered in the city of Bengaluru, India. Narayana Health was founded in the year 2000 by Dr. Devi Shetty under the aegis of the Asian Heart Foundation (AHF). Since, then it has expanded its presence to 23 hospitals in 14 cities.

Malla Reddy Narayana Multispeciality Hospital in Hyderabad is a 300 bed tertiary care hospital built over five acres with a constructed area of 2.45 lakh square feet at Suraram near Jeedimetla in Hyderabad

The hospital has 6200 beds spread across 23 hospitals in 14 cities (as of December 2013). It has plans to expand to 30,000 beds in coming 7-10 years.

NH is known as a low- cost Indian healthcare service provider; engaged in the provision of an affordable, high- quality healthcare service to the world. For its ability to reconcile quality, affordability and scale, the business model of Narayana Health has become a Global Healthcare case study.

Narayana Health is also a renowned centre for telemedicine; the services rendered here are free of cost. It is now amongst the largest telemedicine networks in the world.

The hospital is always on 24x7 alerts. Malla Reddy NarayanaMultispeciality Hospital has a Centre for trauma & accident emergency, which responds in record time to all kinds of medical emergencies and takes care of medical criticalities immediately. We have a team consisting of 50 consultants including surgeons and 500 paramedical staff who work round the clock to guarantee effective treatment and holistic care

SCOPE AND SERVICES:

- OPD
- Emergency
- Trauma & Critical Care
- Inpatient Services
- Laboratory and Diagnostics
- Pharmacy
- Support Services

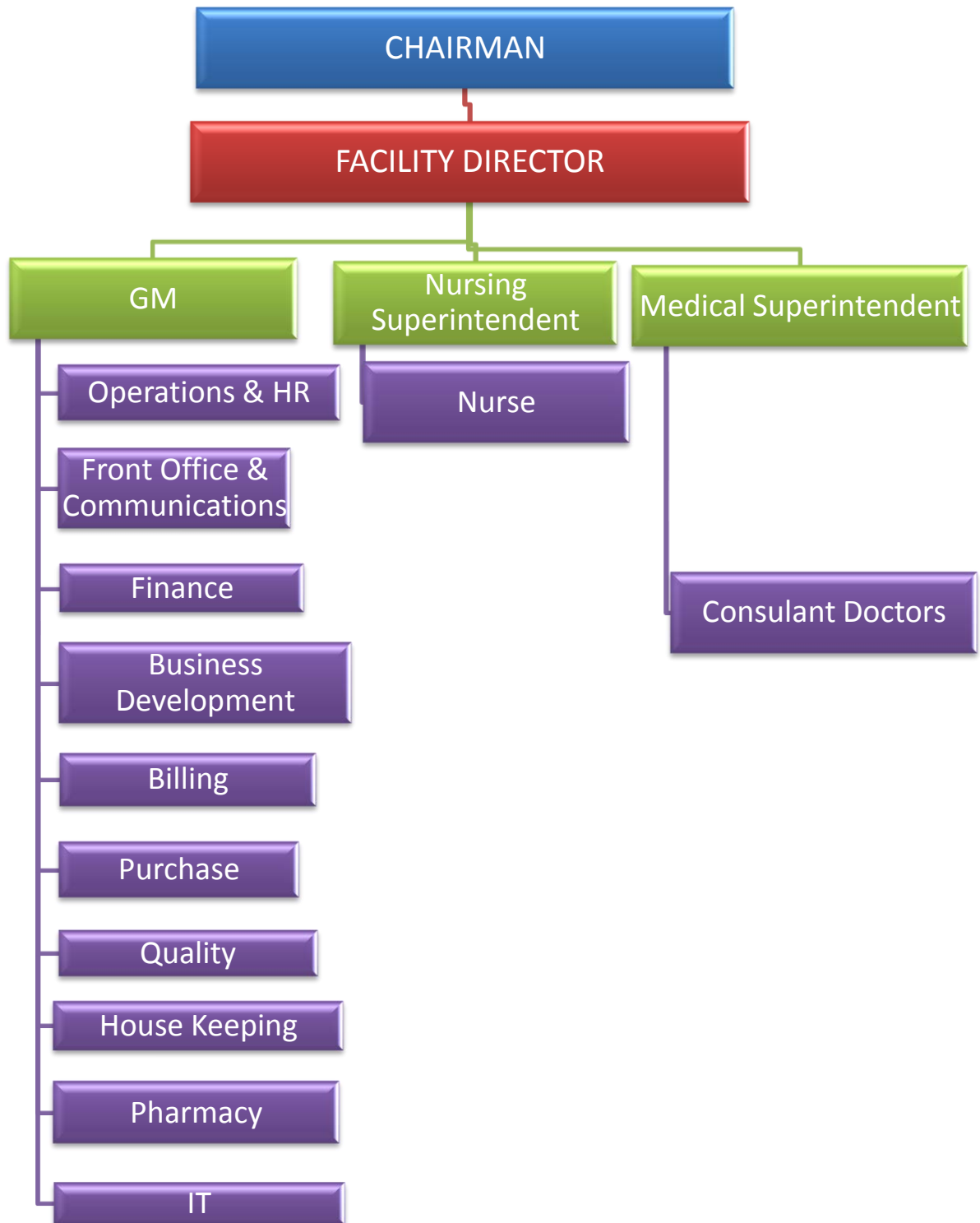
Narayana Multi-specialty Hospital is built on the strong foundation providing services in aforesaid departments. All of these departments have separate scope of services & policies related to patient care. These form the basic working guidelines for the hospital which is under the aegis of vision & mission of **Narayana Multi-specialty Hospital**

SERVICES PROVIDED BY THE HOSPITAL:

NH performs average 40 surgeries every day and conducts around 80,000 OPD patients every month. Over the years, Narayana Health has extended its service offerings from cardiac care to various other specialties:-

- CT SURGEON
- ORTHOPAEDICS
- NEUROLOGY
- GENERAL PHYSICIAN
- PULMONOLOGY
- GASTROENTROLOGY
- NEPHROLOGY
- GENERAL SURGERY
- UROLOGY
- DENTAL
- GYNAECOLOGY
- PLASTIC SURGERY.

ORGANIZATION STRUCTURE:



MISSION, VISION&VALUES:

VISION:

Narayana Health's vision is —“To provide high quality health care, with care and compassion, at an affordable cost, on a large scale.”

MISSION:

—A dream of making quality healthcare available to the masses worldwide”

VALUES:

The core values of the organization are represented by an acronym – **I Care**

I – Innovation and efficiency: To continuously reduce the cost of delivery of healthcare and improve reach;

C - Compassionate Care: To provide accessible care that makes a difference to our patients;

A- Accountability: To honor our commitments with integrity and transparency to our patients, employees and investors;

R- Respect for all: To recognize the contribution of every employee and respect the rights and the dignity of every patient and employee;

E - Excellence as a Culture: To create a culture of ensuring the highest quality of consistent and reliable services to our patients and sustainable value for our stakeholders.

FACILITY LAYOUT:

FLOOR	PATIENT CARE SERVICES
BASEMENT	Emergency department, Medical records department, security office ,Maintenance Department, Housekeeping Department, Physiotherapy, Telecommunication Department, Radiology department, MICU
Ground floor	Registration counter, OPD services, Billing counter, Helpline counter, OP Pharmacy, patient attendant waiting area, CCU, Cath lab, Laboratory department, Blood Bank, IT Department, VIP lounge
First floor	Deluxe ward, dentistry department , Dietetics, Stores, IP pharmacy , APT Unit
Second floor	Administration block, paying general ward, seminar room, ESI ward, Pre op and Post Op female and male wards, patient attendant waiting area.
Third floor	Operation Theatre, NICU, SICU, ITU, Dialysis unit.

BED STRENGTH:

Narayana multi-specialty hospital has 300 operational beds

A CLINICAL AUDIT OF STANDARDS OF MORBIDITY OF STROKE AT NARAYANA MULTI-SPECIALITY HOSPITAL

INTRODUCTION:

What is a clinical audit?

Clinical audit is a quality improvement process that seeks to improve patient care and outcomes through systematic reviews of care against explicit criteria and the implementation of the change. Aspects of the structure, processes and outcomes of care are selected and systematically evaluated against explicit criteria. Wherever indicated changes are implemented at an individual, team or service level and further monitoring is used to confirm improvement in healthcare delivery. (National Institute of Clinical Excellence)

This audit looked at how stroke services were organized and followed at Narayana Multi-specialty Hospital and aims at improving the quality of stroke services and patient care by reviewing care against standards.

BACKGROUND ON STROKE:

Stroke is a medical emergency.

The World Health Organization (WHO) defines stroke as: —apidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24 hours or longer or leading to death, with no apparent cause other than of vascular origin”.

Stroke patients require urgent access to hospital care, including a brain scan as soon as possible to determine the type of stroke and appropriate treatment.

Stroke is one of the top three causes of death and the largest cause of adult disability worldwide.

One in every 10 deaths is caused by stroke and is the third most common cause of death in developed countries, after coronary heart disease and cancer.¹

IDENTIFYING THE SIGNS AND SYMPTOMS OF STROKE:



Figure 1 IDENTIFYING SIGNS AND SYMPTOMS OF STROKE

RATIONALE:

15 million people suffer a stroke each year; one-third die and one-third are left permanently disabled worldwide¹.

Approximately: ²

- 85% of strokes are caused by a blockage (ischemic strokes).
- 15% of strokes are caused by bleeding in the brain (hemorrhagic strokes)
- 10% caused by a primary intracerebral hemorrhage
- 5% caused by a subarachnoid hemorrhage.

The incidence of stroke increases rapidly with age.³

High blood pressure is the most important risk factor for stroke, contributing to about 50% of all strokes.⁴

It is estimated that 10% of deaths from stroke are due to smoking.⁵

People regularly consuming a large amount of alcohol have a threefold increased risk of stroke.⁶

A swallowing disorder called dysphagia often occurs as a result of stroke. Dysphagia may occur in up to 65 percent of stroke patients. If not identified and managed, it can lead to poor nutrition, pneumonia and increased disability.

The report findings enable the processes of stroke services at Narayana Multi-specialty Hospital, Hyderabad to be compared with international standards outlined in the fourth edition of the National Clinical Guideline for Stroke (2012) published by the Intercollegiate Stroke Working Party and, the NICE (National Institute for Health and Clinical Excellence) Clinical Guideline, the National Stroke Strategy 2007 and the NICE Quality Standard for Stroke (2010).

This clinical audit will help in identifying key areas where improvement is needed by comparing against the standard.

AIMS OF THE CLINICAL AUDIT:

- To assess the quality of stroke services and patient care by reviewing care against standards.
- To measure the performance of the stroke services and quality of care at Narayana Multi-specialty Hospital against the benchmark.
- To identify key areas where improvements are needed for stroke care.

SETTING UP STANDARDS:

- **These standard were based on International guidelines published in first pilot report of Sentinel Stroke National Audit Programme January-march 2013.**
- 88% stroke patients should be tested for visual field.
- 91% stroke patients should be tested for sensory functions.
- 85% stroke patients should be assessed for cognitive status.
- Stroke patients should be screened for swallowing disorders:
 - ✓ in the first 4 hours of admission – 61%
 - ✓ within 24 hours of admission – 83%
 - ✓ Within 72 hours of admission – 77.3%

Additional parameters considered for this audit were:

A) On admission:

- Gender
- Age
- Co morbidities
- Glasgow Coma Scale.(GCS)
- NIHSS
- ASPECTS score
- Type of stroke:
Hemorrhagic, ischemic or Transient ischemic attack (TIA)
- Volume of blood loss, if hemorrhagic.

B) During the course of stay in the hospital:

- How many patients got intubated?
- How many patients had tracheostomy done during the course of the stay in hospital?
- How many had aspirational pneumonia?
- How many had DVT?
- How many had worsening of sensorium?
- How many required surgery?
- How many went off with discharge with tube feeding?

C) At discharge:

- How many had MRS of 3 or more?

DATA COLLECTION METHOD:

Quarterly data from 1st January 2014 to 31st March 2014 was collected retrospectively from the case sheet notes.

Total numbers of stroke cases identified during this period were 93.

Of these 93 stroke cases 50 cases were selected randomly.

- ***SAMPLE SIZE:*** 50 stroke cases (n=50)
- ***SAMPLING TECHNIQUE:*** Simple random sampling technique
- ***STUDY AREA:*** Neurology intensive care unit (NICU) at Narayana Multi-specialty Hospital, Hyderabad.
- ***STUDY PERIOD:*** 3 weeks.
- ***TYPE OF DATA:*** Secondary, qualitative and quantitative
- ***TYPE OF STUDY:*** Analytical study
- ***TOOL FOR DATA COLLECTION:*** A checklist was prepared to measure the performance against the standard.
- ***EXCLUSION CRITERIA:*** Stroke of venous origin and Lacunar infarcts.

CLINICAL AUDIT REPORT:

This report includes complete data for 50 stroke patients admitted to hospital between 1 January 2014 and 31 March 2014.

AIMS OF THE REPORT:

- To report the process of stroke care in the first 72 hrs of admission.
- To identify key areas where improvements are needed for stroke care.

CASEMIX:

1.1 Patient Number:

This report looks at the processes of stroke care for 50 patients at the hospital.

1.2. Gender:

Figure 2 gender distribution of stroke

GENDER(n=50)	PERCENTAGE
MALE (n=29)	58%
FEMALE (n=21)	42%

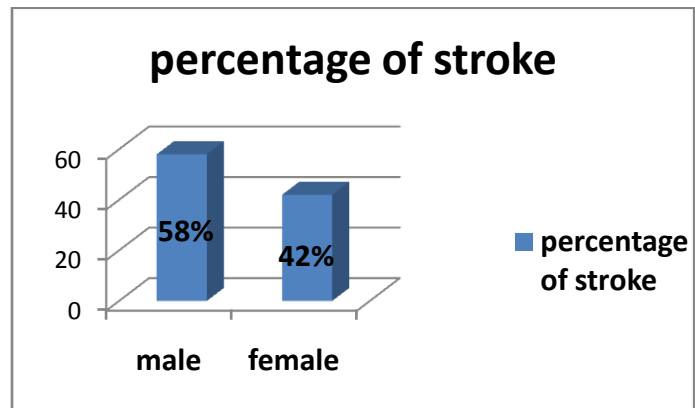


Figure 3 Percent Distribution of stroke in Gender

1.3 AGE:

AGE	MEDIAN AGE(53 yrs)
MALE	53 (33-78)years
FEMALES	52 (31 -82) years

Figure 4 age distribution of stroke in males and female

NOTE:

The median age at which the Indian population is suffering from stroke is much lesser when compared to the median age internationally. [Male=73 (63-82), Female=81 (72-87) years]

1.4: co- morbidities:

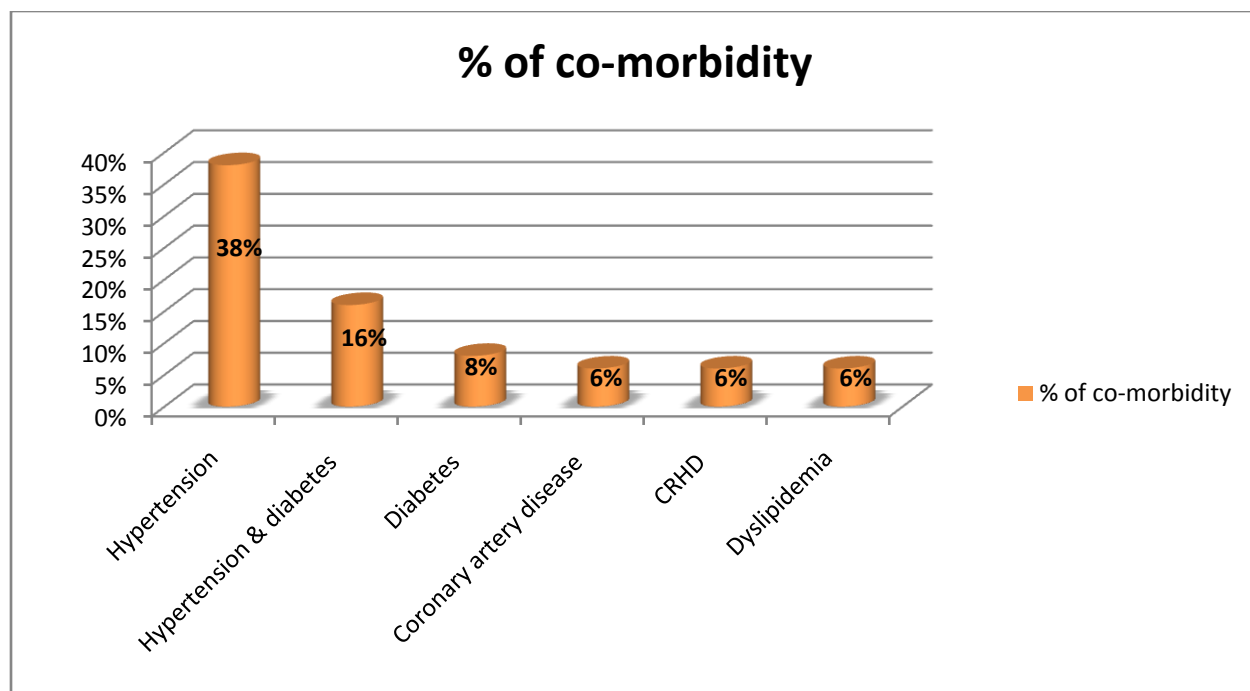


Figure 5 % distribution of co-morbidity

No of co-morbidities:

The audit also recorded the number of different types of co morbidities existing in a patient at a time.

NO. OF CO-MORBIDITIES	NUMBER	PERCENTAGE
0	7	14%
1	31	62%
2	11	22%
3	1	2%

Figure 6 No. of Co-morbidities

1.5 STROKE TYPE:

The distribution of the type of the stroke during the audit was as follows:

STROKE TYPE	NUMBER	%
Ischemic stroke	36	72%
Hemorrhagic stroke	13	26%
TIA	1	2%

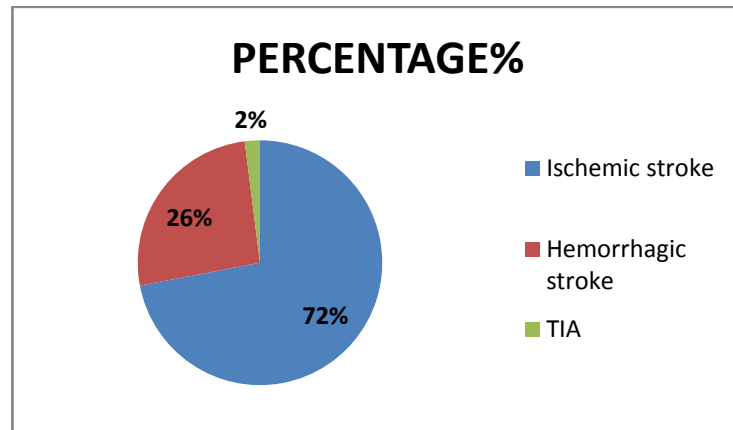


Figure 7 Percent distribution of Type of Stroke

SCORES ON ADMISSION

1.1 Glasgow coma scale (GCS)

The Glasgow coma scale (GCS) measures the eye, motor and verbal responses and is widely used for judging the prognosis in a patient with an altered consciousness levels.

GCS	NUMBER	PERCENTAGE
3 (deep coma or death)	0	0%
< 8 (severe)	2	4%
8 -12 (moderate)	7	14%
≥ 13 (minor)	41	82%

Figure 9 GCS assessment

1.2: National Institute Of Health Stroke Scale (NIHSS): (for ischemic stroke)

National Institute of Health Stroke Scale (NIHSS) is used to measure the level of impairment caused by a stroke.

Also in the audit NIHSS allows for the objective comparison of efficacy across different stroke treatments and interventions.

SCORE	NUMBER	PERCENTAGE
0 (no stroke)	0	0%
1-4 (minor stroke)	2	6%
5-15 (moderate stroke)	29	66%
16-20 (moderate to severe)	2	6%
21-42 (severe)	0	0%
Score not documented	3	8%

Figure 10 NIHSS Assessment

NOTE:

92% patients were tested for sensory and visual functions against the standard 91 %(visual testing) and 88 %(sensory testing) respectively.

1.3 Alberta Stroke Program Early CT score (ASPECTS): (for ischemic stroke)

Alberta Stroke Program Early CT score (ASPECTS) allows rapid calculation of infarct extent for middle cerebral artery infarcts.

ASPECTS	NUMBER	PERCENTAGE
Documented	19	53%
Non-documented	17	47%

Figure 11 ASPECTS Assessment

SCORES AT DISCHARGE:

1.1 Modified Rankin scale (MRs):

During the audit almost all patient had premorbid restriction of activity (Rankin score greater than 0) and of the MRs documented cases nearly 50% were discharged with significant disability. (Rankin score greater than 2)

MRS Score	NUMBER	PERCENTAGE
0 (no symptoms)	0	0%
1 (no significant disability)	1	2%
2 (slight disability)	7	14%
3 (moderate disability)	5	10%
4 (moderately severe disability)	20	40%
5 (severe disability)	5	10%
Score non documented	12	24%

Figure 12 MRS Assessment

MRs Score and its compliance with standard:

Here n=1139

Modified Rankin Scale score	Percentage
0 (no symptoms)	57.1%
1 (no significant disability)	15.2%
2 (slight disability)	9.4%
3 (moderate disability)	10.3%
4 (moderately severe disability)	5.9%
5 (severe disability)	2.1%

Figure 13 MRS comparison with standard

COGNITIVE STATUS ASSESMENT:

COGNITIVE STATUS	NUMBER	PERCENTAGE
Assessed	42	84%
Non- assessed	8	16%

Figure 14 Cognitive status

NOTE:

84% patients were assessed for cognitive status against benchmark of 85%.

SWALLOWING SCREENING AND ASSESSMENT:

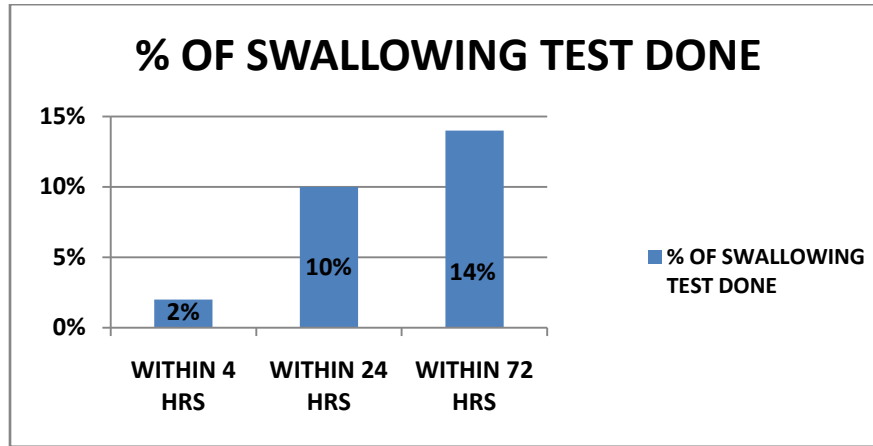


Figure 15 % of swallowing disorder assesment

NOTE:

- ☐ Only 2% patients were screened for swallowing disorders against the standard of 56% within 4 hrs of admission.
- ☐ Only 10% patients were screened for swallowing disorders against the standard of 83% within 24 hrs of admission.
- ☐ Only 14% patients were screened for swallowing disorders against the standard of 86% within 72 hrs of admission.

SEVERITY/CARE ASSESMENT:

	Acute ischemic stroke(n)	Acute hemorrghic stroke	TIA	NUMBER	%
PTs. WITH TRACHEOSTOMY	2	4	0	6	12%
INTUBATED	2	5	0	7	14%
PTs. DISCHARGED WITH TUBE FEEDING	1	2	0	3	6%
ASPIRATIONAL PNEUMONIA				6	12%
DVT	1	0	0	1	2%
SURGERY REQUIRED	3	5	0	8	16%

Figure 16 Severity/ care assessment

During the audit it was also observed that:

- 42% (n=21) were alcoholic.
- 6% (n=3) were smoker.
- 2% (n=1) had taken DAMA (discharge against medical advice)

ASSESSMENT OF STROKE CARE BY COMPARING NIHSS (ON ADMISSION) AND MRS SCORE (AT DISCHARGE).

This table shows the quality of stroke care services provided to the patients by comparing the NIHSS on admission and MRs at discharge.

It shows the assessment of the severity of the case before admission in the hospital versus the disability resulted after the receiving the treatment.

It gives the rough idea about the quality of care provided at the hospital.

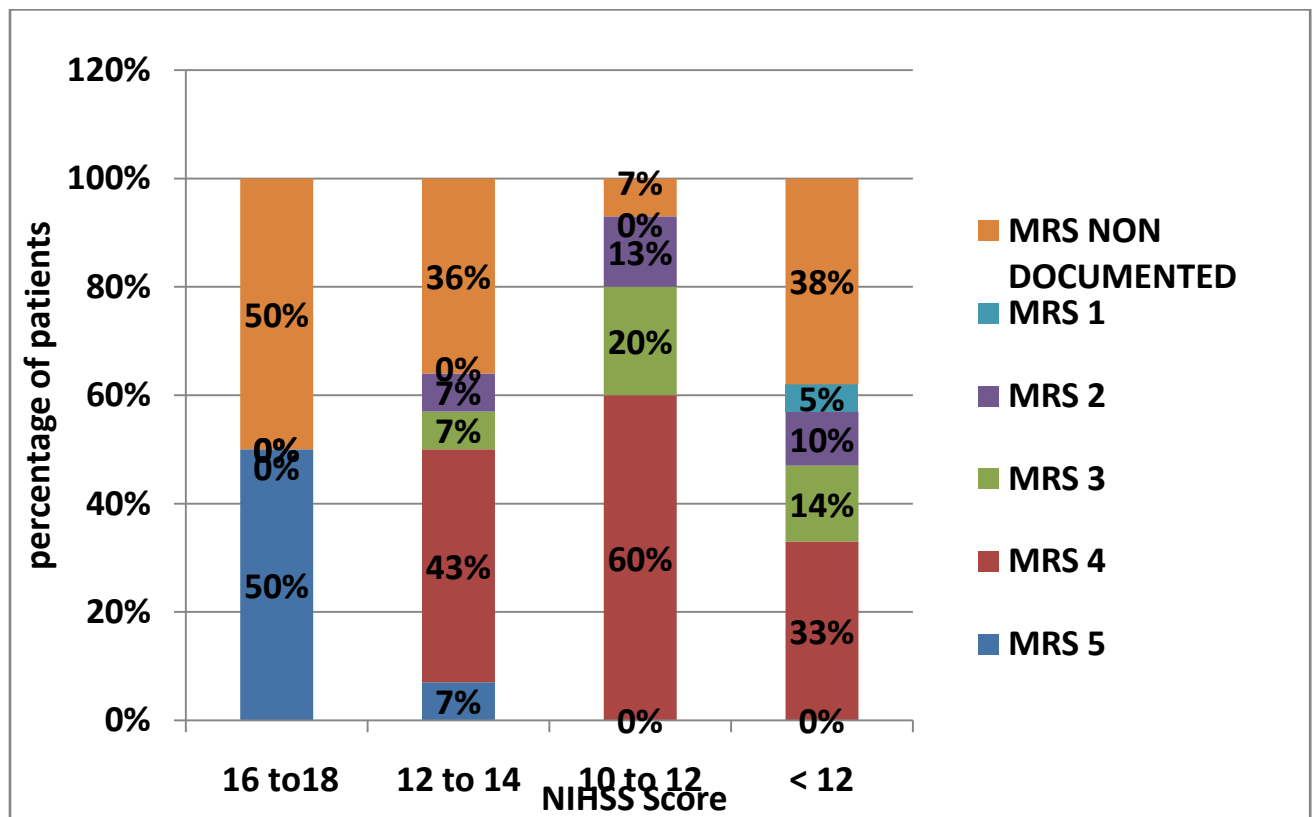


Figure 17 Assessment of Outcome of Care by comparing NIHSS and MRS Scores

This table shows the percentage of patients with NIHSS (1-18) who had aspirational pneumonia.

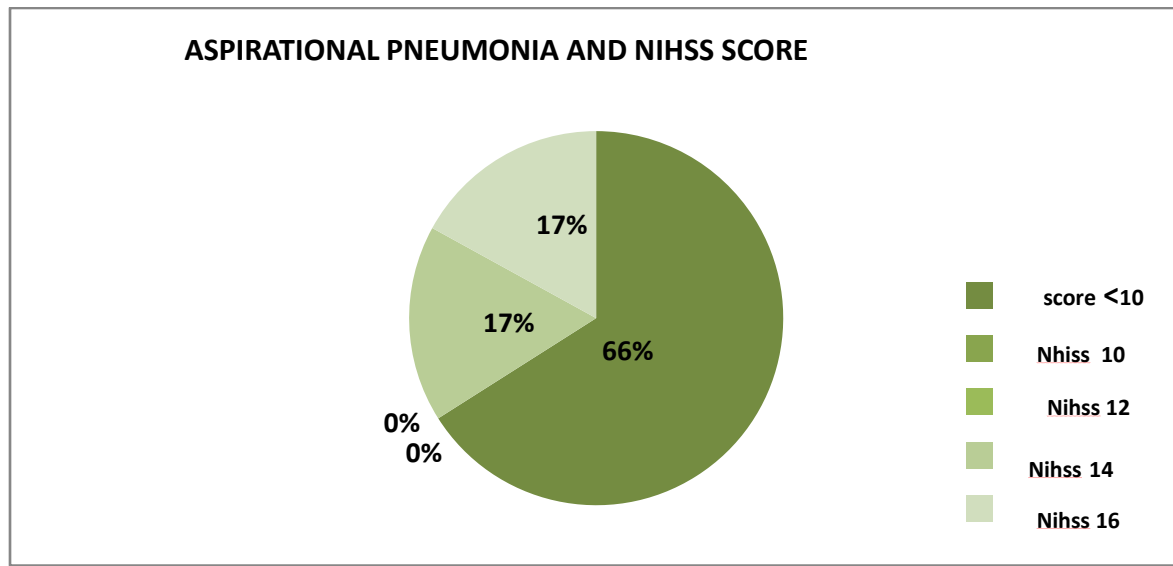


Figure 18 Aspirational Pneumonia and NIHSS Score

COMPARISON WITH STANDARD:

The table below summarizes and compares the stroke characteristics of the cases between the first quarter (January – March 2014 admissions) at Narayana Multi-speciality Hospital and the International standards.

100% is the optimal compliance.

INDICATORS	INTERNATIONAL STANDARDS	% COMPLIANCE
Proportion of male & female	Male=49.6% Female=50.4%	Male=58% Female=42%
Median age	Male=73 (63-82) Female=81 (72-87) years	Male=53 (33-78)yrs Female=52 (31-82)yrs
Proportion of co-morbidity	HTN=53% Diabetes=18.8%	HTN=38% Diabetes=8%
Number of co morbidity	0=26.6% 1=35.8% 2=25.7% 3=10%	0=14% 1=62% 2=22% 3=2%
Stroke type	Ischemic=88.1% Hemorrhagic=10.6%	Ischemic=72% Hemorrhagic=26%
Proportion of pts. Tested for visual fields and sensory functions.(NIHSS)	Visual field-88% Sensory func.-91%	92% (both)
Proportion of pts. Assessed for cognitive status.	85%	84%

Proportion of pts.with tracheotomy	Not asked	12%
Proportion of pts. intubated	Not asked	14%
Proportion of pts.with aspiration pneumonia	Not asked	12%
Proportion of pts. With DVT	Not asked	2%
Proportion of pts. Discharged with tube feeding	Not asked	6%
Proportion of pts. Required surgery	Not asked	16%
Proportion of patients screened for swallowing disorder:		
a) Within 4 hrs of admission.	56%	2%
b) Within 24 hrs of admission.	83%	10%
c) Within 72 hrs of admission.	86%	14%
MRS Score		
• 0 (no symptoms)	57.1%	0%
• 1 (no significant disability)	15.2%	2%
• 2 (slight disability)	9.4%	14%
• 3 (moderate disability)	10.3%	10%
• 4 (moderately severe disability)	2.1%	40%
• 5 (severe disability)	5.9%	10%

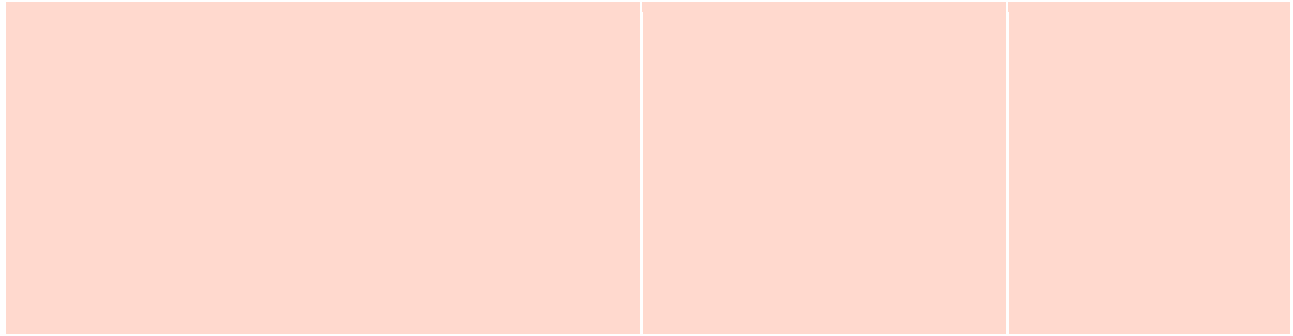


Figure 19 Compliance with standard

AREAS OF IMPROVEMENT/CONCLUSION:

After analyzing this audit report our main aim is to improve the MRs score 2 & MRs score 3 at discharge for the patients who gets admitted in the hospital in future with NIHSS score of <12 before seeking any treatment, which is presently 10% and 14% respectively.

SUGGESTIONS:

- **Collection of Data and Documentation:**

Formulation of strategies to drive the routine collection and Systems be put in place for a sustainable national data collection system together with quality improvement mechanisms to ensure best practice care is realized.

- **Continuous quality improvement (CQI) activities:**

The team should meet frequently to review your hospital's processes, care quality, patient safety parameters and clinical outcomes, as well as to make recommendations for improvement.

- **Organized Stroke Service:**

☐ should consists of

1) A ward dedicated to patients with stroke; (2) through a mobile stroke team; and(3) within a generic disability service (mixed rehabilitation ward).

- **'Coordinate Care' Approach:**

An interdisciplinary collaborative team is also essential for successful stroke performance improvement efforts.

- **Screening of swallowing disorder:**

Develop Strategies to improve early management of stroke focusing particularly on proportion of patients screened for swallowing disorder.

REFERENCES:

1. The Atlas of heart disease and stroke, WHO 2004.
http://www.who.int/cardiovascular_diseases/en/cvd_atlas_15_burden_stroke.pdf
(Mackay J, Mensah G: The Atlas of Heart Disease and Stroke. Geneva, Switzerland, World Health Organization, 2004)
2. Intercollegiate Stroke Working Party. National Clinical guideline for stroke, 4th edition. London: Royal College of Physicians 2012 P4
3. Scarborough, P Peto, V Bhatnagar, P, Kaur, A Leal J, Luengo-Fernandez R, Gray A, Rayner M, Allender S (2009) Stroke statistics. British Heart Foundation and Stroke Association: London. P44
4. Roger et al. AHA Heart Disease and Stroke Statistics 2011 update: a report from the American Heart Association. *Circulation* 2011; 123:e18-e209
5. Health Committee second report 2000 The Tobacco Industry and the health risks of smoking Published by authority of the House of Commons London The Stationary Office Ltd. P3
6. Leatherman, S Sunderland, K and Airolidi, M Bridging the quality gap (2008). The Health Foundation London in Scarborough, P Peto, V.
7. Sentinel Stroke National Report August 2013.
8. SSNAP_first_pilot_national_report_january_-march_2013.

A STUDY ON FIRST CASE DELAY IN OPERATION THEATRE AT NARAYANA MULTI-SPECIALITY HOSPITAL, HYDERABAD.

INTRODUCTION:

The operating room is one of the most expensive areas in a hospital. Efficiency is a key issue for Profitability in for-profit institutions and increased efficiency allows more operations to be performed for the same cost in not-for-profit institutions. Improving efficiency can focus on reducing costs and/or increasing the amount of work. Utilization is an evaluation of the clinical activity in a staffed operating room. Productivity is an evaluation of the quality and quantity of work that occurs within a block of surgical time.

A major efficiency effort in most operating rooms is focused on maximizing utilization. Utilization rates are dependent on many factors, including an appropriately booked schedule that starts on time, ends on time, has correct case times and quick turnovers.

Surgery is a collective team effort of surgeons, anesthesiologists, nurses and the paramedical staff and the delay in performing these procedures can be attributed to inept performance of these groups. Operating room delays can negatively impact patients directly, their family members and the staff. Most instances of delay are due to lack of appropriate planning or inadequate utilization of available resources.

One of the factors that have a significant impact on Preoperative delays is the delay in starting the first case of the day. Starting of the first procedure scheduled for the day on time plays a crucial role in setting the tone for how an operating room (OR) functions.⁴

Delayed start for the first case of the day will have a ripple effect as the following cases get delayed which result in patient annoyance and disruption of operating room and staff schedules.

Delay in performing operating procedures is one of the key factors that hinders optimal flow of patients and also has a significant impact on the economic outcome of the hospital. These delays

could arise at various points due to multiple personnel involved in the process of performing a surgery.⁶

This study focused exclusively on the delay in starting the first case each day in the operating rooms of Narayana Multi-specialty Hospital, Hyderabad, identify possible causes for first case delay in performing operating procedures on time and instituting recommendations for the same which would prevent such delays.

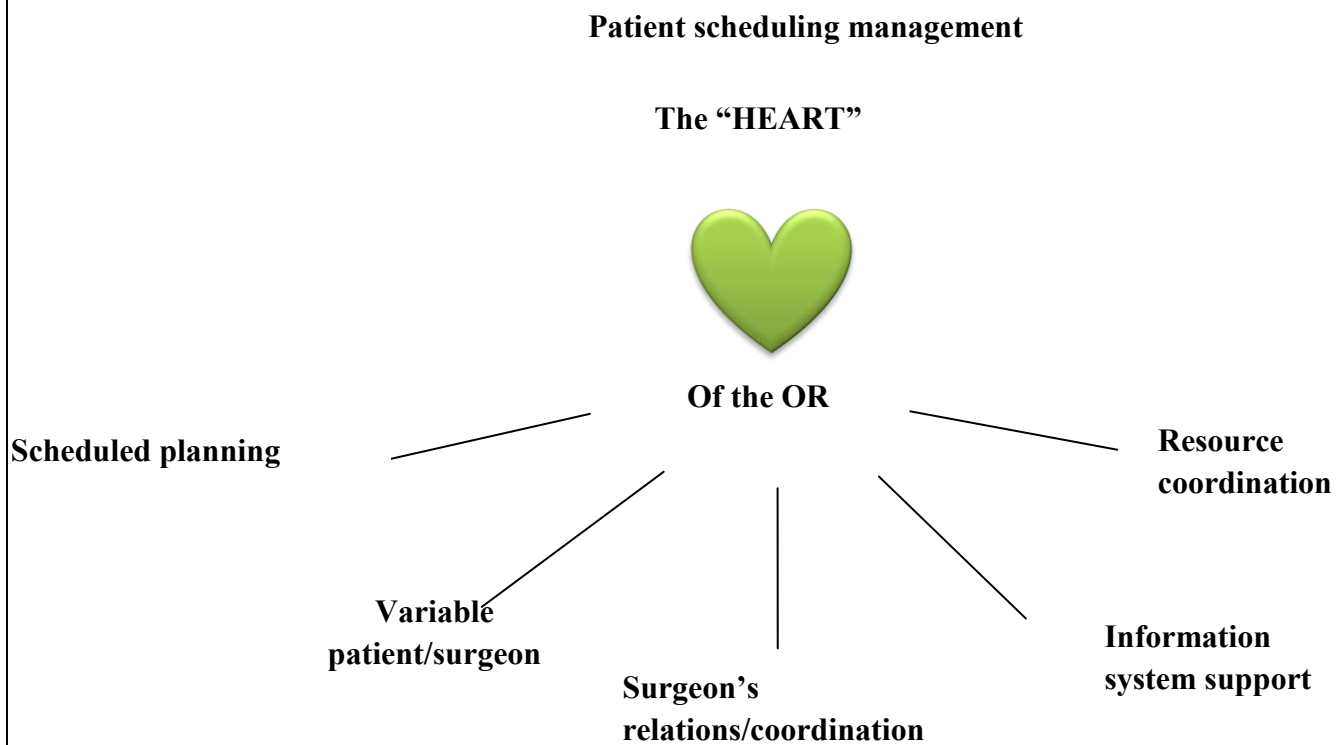


Figure 20 patient scheduling management

RATIONALE:

First case on time is reported as one of the important measure of the theatre efficiency.

First case on time helps to ensure that operating room time and resources are not wasted due to delays. In a hospital operating room, the first scheduled surgery of the day is the only guaranteed start time. If it's late, the rest of the day may be adversely affected, causing delays for patients and their families, scheduling conflicts for surgeons and possible overtime for OR staff.¹

For a variety of reasons, however, first cases if delayed, leads to subsequent cases to be delayed and patient satisfaction to decrease.²

First case on time can result in significant savings in addition to creating revenue for a hospital. First case of the day is typically where greatest control can be applied.²

First case delay has been identified as a potential major contributor to surgical cancellations, overtime and dissatisfaction for patient, staff and physicians.³

During the study period at Narayana Multi-specialty Hospital, Hyderabad it was observed that there was an average delay of 1 to 1 ½ hrs for the first case start (FCS) of operation.

The purpose of this study was to identify and address the delay in first case start in the OR and provide recommendations for the improvement of FCS.

RESEARCH QUESTION:

To determine the reasons for delay in first surgical case start time at Narayana Multi-specialty Hospital, Hyderabad?

OBJECTIVES:

- To assess the performance of daily start time of first surgeries in OR.
- To identify and address the First case delay in OT.
- To determine reasons for First case delay during elective operating lists and suggest recommendations.

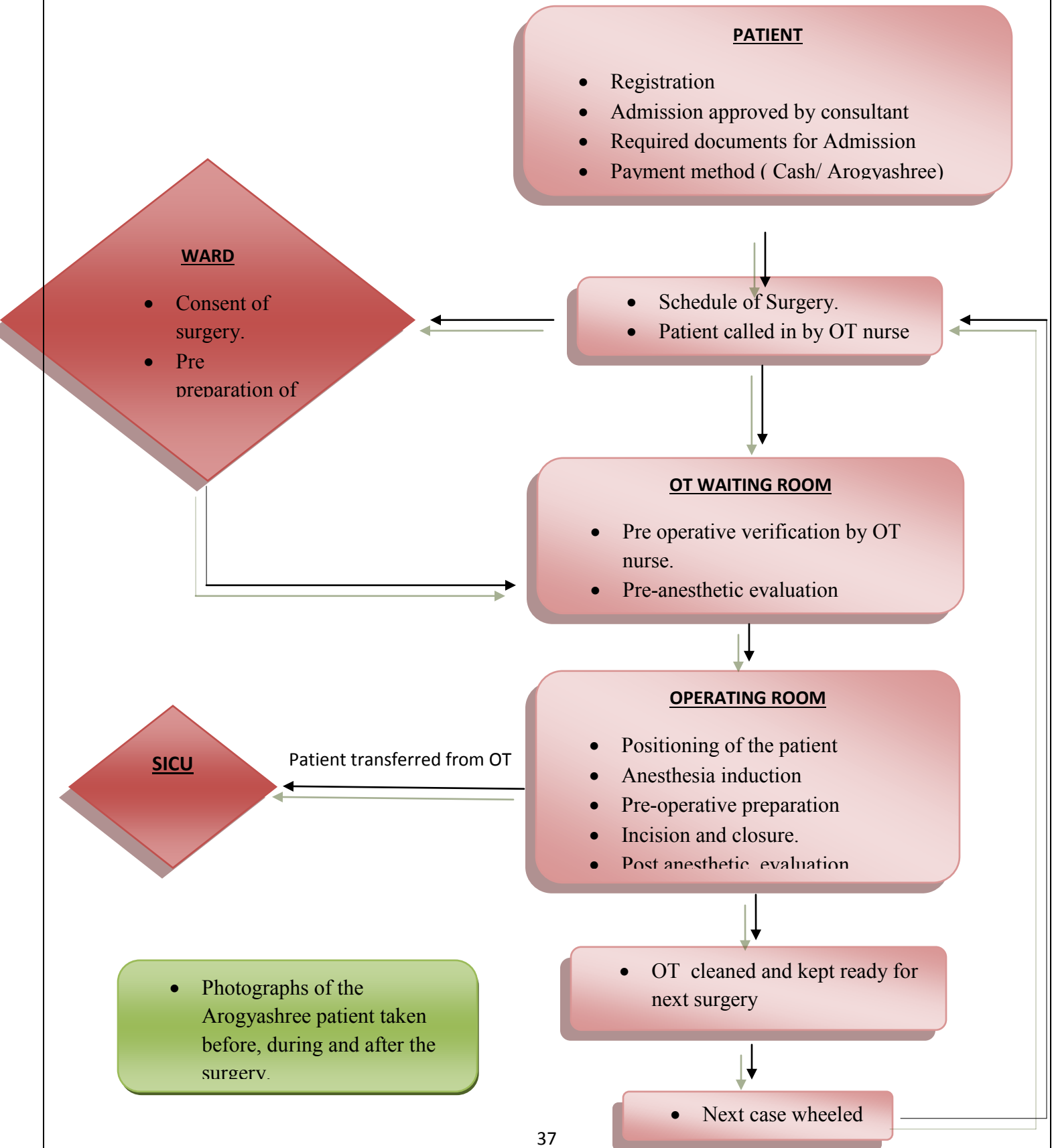
OPERATIONAL DEFINITIONS:

- A first case start-on time (FCS) is defined as the first scheduled case of the day in each operating room before 8:00 am.
- The patient in-room time is defined as the time at which the patient physically enters the room (also referred to as “wheels in”).
- Thus, the first case start- on time (FCS) measures the delay of any first cases that have an actual patient in-room time greater than the scheduled start time.
- Any difference greater than zero counts as a delay or Non-productive time.

FUNTIONS OF AN OPERATION THEATRE:

- The Operation Theatre (OT) is a place where surgical operations are performed by surgeons. In addition, specific diagnostic, therapeutic or invasive procedures are also performed by specialists from a variety of disciplines.

OPERATION THEATRE PROCESS FLOW



DATA COLLECTION METHOD:

The study was performed prospectively in the OT complex consisting of 5 ORs in Narayana Multi-specialty Hospital, Hyderabad and focused on elective cardiac and orthopedic surgeries that account for more than 70% of the surgical volume.

It was conducted over a period of 30 days that, excluding Sundays and public holidays.

43 elective surgeries were observed during the study period.

43 elective surgeries were observed involving general, cardiac and orthopedic procedures which ranged in time from 20 minutes to almost 4 hours.

- *Study design*: Observational and Analytical.
- *Sampling Method*: Non Probability Purposive sampling.
- *Sample size*: 43 elective surgeries.
- *Area of Study*: Narayana Multi specialty hospital, Hyderabad.
- *Study Duration*: 1 month.
- *Data Collection Method*: Observational study

All the surgeries scheduled at 8:00 am. (First Case of the Day)

ETHICAL CONSIDERATIONS:

A) ON PART OF PATIENTS:

Details about patients should be confidential.

B) ON PART OF THE HOSPITAL:

Details about the surgeons performing the surgeries, Medical record number of the hospital should be confidential.

A checklist was prepared to check and measure the average first case delay. [Fig.1]

	A	B	C	D	E	F	G	H	I	J	K	L
	SR.NO	DATE OF SURGERY	MRN	NAME	AGE/SEX	PROCEDURE	SCHEDULED TIME	OT NUMBER	PT. IN TIME	AVG. FIRST CASE DELAY	REASON FOR DELAY	
1												
2												
3												
4												
5												
6												
7												
8												
9												
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Figure 22 checklist for first case start delay

In the hospital, patients were categorized as:

- Arogyashree patients:** Rajiv Aarogyasri or Aarogyasri is a program of the Government of Andhra Pradesh. It covers those below the poverty line. The government issues an Aarogyasri card and the beneficiary can use it at government and private hospitals and get the services free of cost.
- Employee State Insurance Act(ESI):** Employees' State Insurance is a self-financing social security and health insurance scheme for Indian workers.
- Cash patients:** These patients were not covered any schemes.

According to the hospital policies all the patients that are posted for elective surgeries needs to get an approval from Arogyashree before heading into the OR for surgery.

STATISTICAL ANALYSIS:

A total of 73 operations were performed in the study period, out of which 43 surgeries were the first cases, on patients aged 1yr and 88yrs, 69% of who were males and 30% were females.

The relative load of the surgeries was as follows:

- A) Cardiac- 53%
- B) Orthopedic - 30%
- C) General – 16%

During the study period at Narayana Multi-specialty Hospital, Hyderabad it was observed that there was an average delay of 1 to 1 ½ hrs for the first case start (FCS) of operation.

The analysis of the reasons for time-waste is summarized in Fig. 2 depicting their proportion by cause.

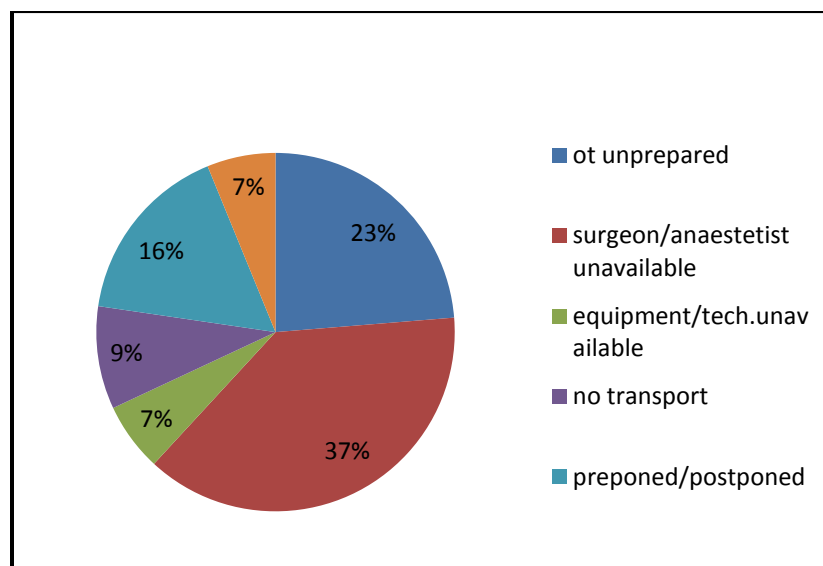


Figure 23 Causes for first case start delay

A) SURGEON UNAVAILABILITY:

An ~~un~~available surgeon ~~re~~sulted from late arrival to the OR (16 instances).

The total time lost from surgeon unavailability amounted to 25.17 hrs

- a) Cardiac – 7.72hrs (6 instances)
- b) Orthopedic – 11.10 hrs (7 instances)
- c) General – 6.35 hrs (3 instances)

B) OT UNPREPARED:

Total instances: 10

The total time lost from OT unprepared amounted to 7.92 hrs.

- a) Cardiac – 3.75 hrs (7 instances)
- b) Orthopedic – 0.45 hrs (1 instances)
- c) General – 3.42 hrs (2 instances)

C) EQUIPMENT/TECNICIAN UNAVAILABLE:

~~E~~quipment/technician unavailable ~~re~~sulted from late arrival to the OR or delay due to equipments not working properly

Total instances: 3

The total time lost from Equipment/technician unavailability amounted to 2.55 hrs.

- a) Cardiac – 1.08 hrs (2 instances)
- b) Orthopedic – 1.28 hrs (1 instances)

D) PREPONEMENT OR POSTPONEMENT:

Preponement or postponement of surgeries resulted from wait for approval from Arogyashri or unanticipated problems in patients' clinical condition

Total instances: 7

The total time lost from Pre-ponement or postponement of surgeries amounted to 16.12 hrs.

- a) Cardiac –6.25 hrs (2 instances)
- b) Orthopedic – 5.82 hrs (3 instances)
- c) General – 4.03 hrs (2 instances)

D) NO TRANSPORT:

–NO TRANSPORT” includes delay due to inability to transfer patient from ward to the OR or from OR to the ward.

Total instances: 4

The total time lost from No Transport amounted to 2.17 hrs.

- a) Cardiac –0.58 hrs (3 instances)
- b) General – 1.35 hrs (1 instances)

Table 1 shows total time wasted in the operating room department wise.

DEPARTMENT	TOTAL NON-PRODUCTIVE TIME(Hrs)
Cardiac	19.38 hrs
Orthopedic	18.65 hrs
general	15.15 hrs

Figure 24 department wise total non-productive time.

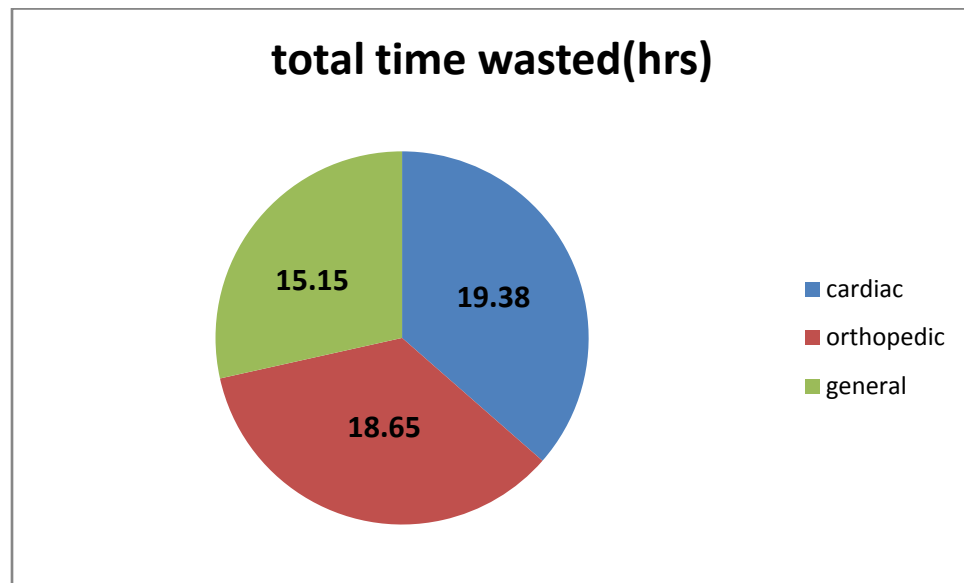


Figure 25 Total non-productive time

MISCELLANEOUS CAUSES FOR DELAY:

- Insufficient nursing staff and surgeons
- Insufficient housekeeping staff
- OR assignment for emergency procedures.
- Unanticipated problems in patients' clinical condition.

RESULTS:

OR “non productive time” defined as the time in which the scheduled OR was not busy with the scheduled patient amounted to approximately 53.18 hrs.

It was wasted owing to OT unprepared (23%), unavailability of surgeons (37%), delay in transport to the OR (6%), delay due to equipment or technician unavailability (6%) and due to either preponement or postponement of surgeries (16%).

Another issue identified was waiting for approval from Arogyashree department before heading for surgery and was one of the major cause for postponement of surgeries, other being, unanticipated problem in patient’s clinical condition

Also insufficient nursing and surgeon staff, and insufficient housekeeping staff and OR assignment for emergency surgeries were the additional contributing cause for the delay.

CONCLUSION:

- Continuous surveillance of OT complex—patients’ prompt care, repeated evaluation, and wise staff deployment—could maximize OR efficiency.
- This improvement can be brought about by the improvement team, particularly improving case scheduling and facility layout.

Strategies aimed at addressing operating theatre delays are unlikely to achieve their desired aims without a more detailed understanding of medical decision making and work practices, and the intra- as well as inter-professional hierarchies underpinning

- them.

REFERENCES:

1. National medical journal of India, vol 13 No 3
2. Nsw auditor general's report, managing operating theatre efficiency for elective surgery
3. Denton B, Viapiano J, Vogl A (2007) Optimization of surgery sequencing and scheduling decisions under uncertainty. Health Care Manag Sci 10(1):13–24
4. Dexter F, Epstein R, Marcon E, de Matta R (2005) Strategies to reduce delays in admission into a postanesthesia care unit from operating rooms. J Perianesth Nurs 20(2): 92–102
5. <http://www.aagbi.org/sites/default/files/theatreefficiency03.pdf>
6. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2878988>.
7. Journal of Evaluation in Clinical Practice ISSN 1365-2753: managing and avoiding delay in operation theatre: A qualitative, Observational study.

A CLINICAL AUDIT OF CENTRAL LINE INFECTION RATE IN DIALYSIS UNIT,NARAYANA MULTI- SPECIALITY HOSPITAL,HYDERABAD.

INTRODUCTION:

What is central line associated blood stream infections (CLABSI)?

A CLABSI is a primary bloodstream infection (that is, there is no apparent infection at another site) that develops in a patient with a central line in place within the 48-hour period before onset of the bloodstream infection that is not related to infection at another site.

The use of central venous catheters (CVCs) is an integral part of modern health care, allowing for the administration of intravenous fluids, blood products, medications, and parenteral nutrition, as well as providing access for hemodialysis and hemodynamic monitoring.

However, their use is associated with the risk of bloodstream infection caused by microorganisms that colonize the external surface of the device or the fluid pathway when the device is inserted or manipulated after insertion.

In the United States, nearly 3 million of central venous catheters (CVCs) are used in the hospitals. An estimated 41,000 central line-associated bloodstream infections (CLABSI) occur in U.S. hospitals each year

Central line--associated blood stream infections (CLABSI) are important and deadly HAIs, with reported mortality of 12%-25%.

RATIONALE:

Infections that patients develop while they are receiving care in a health care setting for another condition are termed health care–associated infections (HAIs).¹

Between 4 percent and 5 percent of hospital admissions result in an HAI.

More than 75% of all HAIs in hospitals are caused by four types of infections: ²

- Urinary tract infections (34%)
- Surgical site infections (17%)
- Bloodstream infections (14%)
- Pneumonia (13%)

CVCs are the most frequent cause of health care–associated bloodstream infections.³

CLABSIs are the infections introduced when a central line is placed in a large vein in the neck, chest or arm to enable the rapid administration of fluids, blood or medication to critically ill patients.⁴

Central venous catheters disrupts the integrity of the skin, making the infection with the bacteria or fungi not only possible but also dangerous, as the infection may spread to blood stream.⁵

The annual direct cost for providing treatment for a preventable infection is substantial; estimates ranges from \$28billion to \$45 in U.S.⁶

These costs do not include indirect costs related to lost productivity or non-medical costs and also do not factor in the intangible cost associated with patient's diminished quality of life.

It has been estimated that 80,000 CLABSIs occur in ICUs in the United States each year.⁷ however, if patients outside ICUs are also included; the estimate increases to 250,000cases of CLABSI each year.⁸

CLABSIs are serious but often preventable infections when evidence-based guidelines are followed for the insertion and maintenance of central lines. As with other HAIs, CLABSIs also increase the cost of health care and prolong hospital lengths of stay by up to three weeks.⁹

This clinical audit will help in assessing the present central line care services at Narayana Multi-specialty Hospital, Hyderabad and identify key areas where improvement is needed by comparing against the standard.

IMPERATIVES FOR THE ELIMINATION OF HAIS:

What is a Bundle?

It is introduced by the Institute for Healthcare Improvement (IHI) and it includes groups of practices with high-level clinical evidence of effectiveness.¹⁰

IHI Bundle – Central Line Insertion Practices (CLIP)

Five practices supported by high-level evidence

- Hand Hygiene
- Maximal barrier precautions
- Chlorhexidine skin antisepsis
- Optimal catheter site selection
- Daily review of line necessity

CLABSI RISK FACTORS:

- Multiple catheters and/or multiple lumens
- Emergency insertion
- Prolonged duration of CVC
- Prolonged hospital stay prior to CVC insertion
- Excessive manipulation of the catheter
- Neutropenia
- Prematurity
- Total parenteral nutrition

MODIFIABLE FACTORS VARY CLABSI RISK:

	HIGHER CLABSI RISK	LOWER CLABSI RISK
INSERTION CIRCUMSTANCES	EMERGENCY INSERTION	ELECTIVE INSERTION
INSERTION SITE	FEMORAL	SUBCLAVIAN
SKIN ANTISEPSIS	ALCOHOL	CHLORHEXIDINE
DURATION OF USE	TEMPORARY	DIALYSIS FISTULA (LOWEST RISK) OR PERMANENT
CATHETER LUMENS	MULTILUMEN	SINGLE-LUMEN

Figure 26MODIFIABLE FACTORS VARY CLABSI RISK FACTORS

AIMS OF THE CLINICAL AUDIT:

- To estimate the central line infection rate in the dialysis unit at Narayana Multi-specialty Hospital, Hyderabad.
- To identify the risks associated with central line infection.
- To identify the key areas where improvement is needed to control the infection rate.

SETTING UP STANDARDS:

These standards are based on international guidelines published in report of Centre for Disease Classification: Standard Infection Rate September 2013

- The international standard for CLABSI is **0.557**.

DATA COLLECTION:

Quarterly data of all the patients undergoing dialysis from 1st January 2014 to 31st march 2014 was collected retrospectively from the case sheet notes.

- *SAMPLE SIZE:* 34 dialysis cases that underwent the procedure of central line insertion.(n=34)
- *SAMPLING TECHNIQUE:* non-probability purposive technique
- *STUDY AREA:* Dialysis unit (NICU) at Narayana Multi-specialty Hospital, Hyderabad.
- *STUDY PERIOD:* 3 weeks.
- *TYPE OF DATA:* Secondary, qualitative and quantitative
- *TYPE OF STUDY:* Analytical study
- *TOOL FOR DATA COLLECTION:* A checklist was prepared to measure the performance against the standard.

CLINICAL AUDIT REPORT:

This report includes complete data for 34 patients admitted for dialysis in the hospital between 1 January 2014 and 31 March 2014.

CASE MIX:

1.1 Patient Numbers:

This report looks at the processes of central line care in the dialysis unit for 34 patients at the hospital.

1.2 Gender:

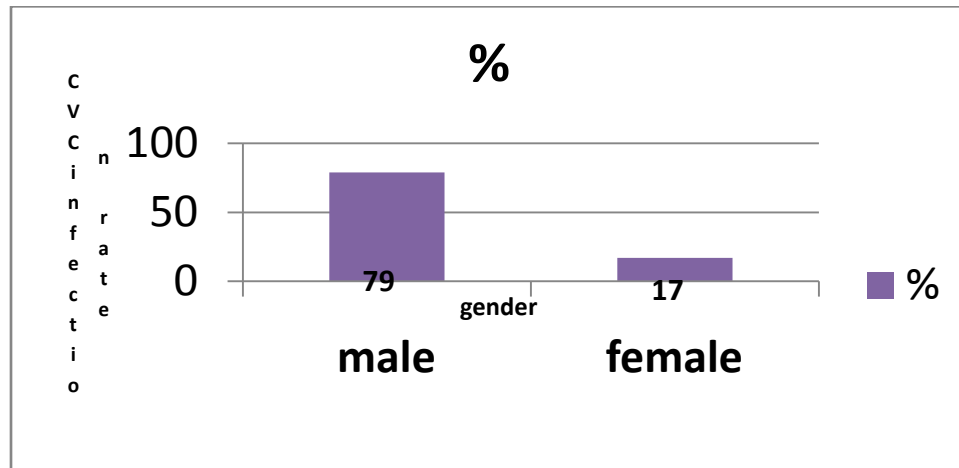


Figure 27 GENDER DISTRIBUTION FOR CVCs

1.3 Age

GENDER	MEDIAN AGE (50 YRS)
MALE	46 YRS
FEMALE	53 YRS

Figure 28 AGE DISTRIBUTION FOR CVCs

NOTE:

IT WAS OBSERVED THAT MEDIAN AGE FOR MALES WAS LESS AS COMPARED TO FEMALES THOUGH THEIR PERCENTAGE FOR CENTRAL LINE INSERTION WAS MORE THAN FEMALES.

1.4 underlying disease:

Underlying disease	Number	percentage
AKI	4	12%
CKD	19	56%
HTN	13	38%
DM	5	15%
RPRF	5	15%
RPGN	3	9%
glomerunephritis	2	6%

Figure 29 UNDERLYING DISEASES

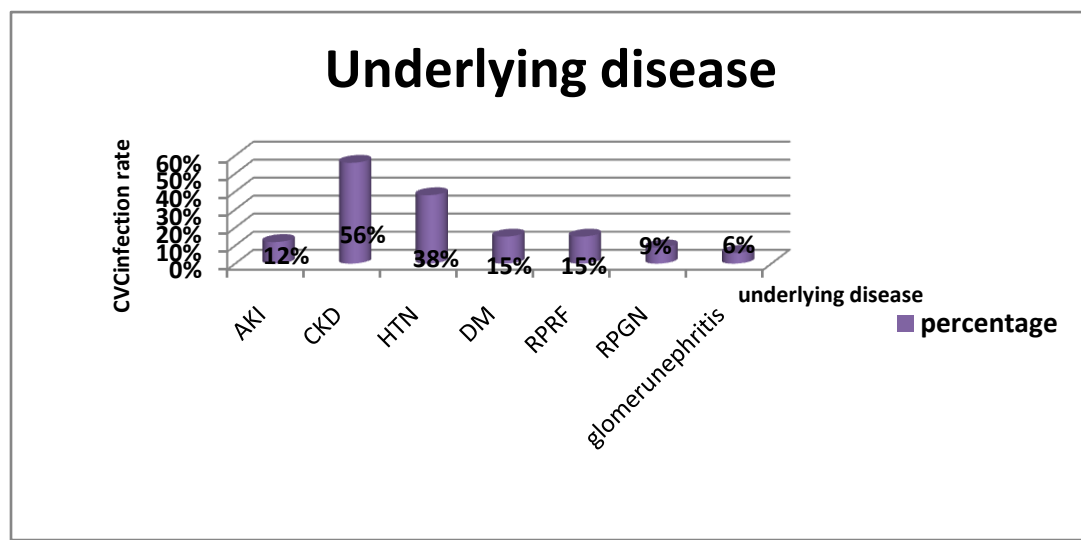


Figure 30 UNDERLYING DISEASES

1.5 Number of underlying disease:

NO. OF UNDERLYING DISEASE	NUMBER	PERCENTAGE
0	6	17%
1	9	26%
2	10	29%
3	8	24%

Figure 31 NO.OF UNDERLYING DISEASES

INSERTION SITE:

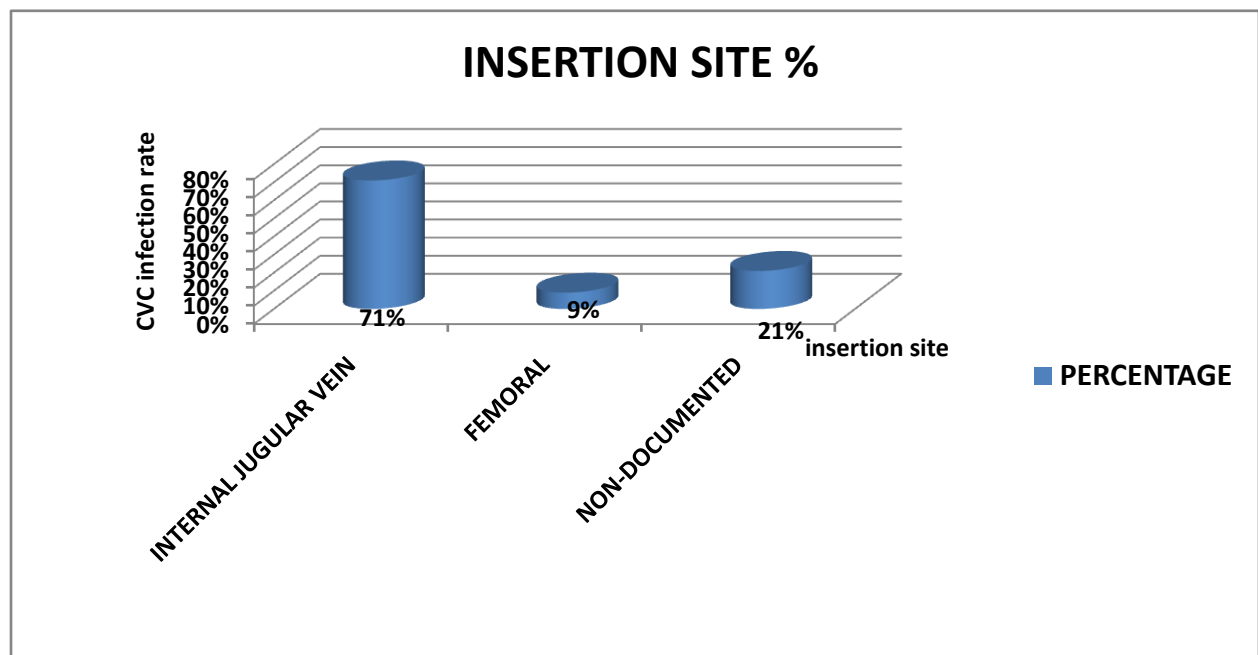


Figure 32 PERCENT DISTRIBUTION OF INSERTION SITE

NOTE:

- 24 %(N=8) WERE ADMITTED IN THE HOSPITAL FOR THE PROCEDURE OF AV FISTULA CREATION.
- OUT OF THESE, 63%(N=5) INSERTION SITE WAS INTERNAL JUGULAR VEIN AND REST 38%(N=3) WERE NON-DOCUMENTED

LIFESPAN OF CVCS:

TYPE OF CATHETER	NUMBER	PERCENTAGE
TEMPORARY	21	62%
PERMANENT	4	12%
NON-DOCUMENTED	8	24%

Figure 33 TYPE OF CATHETHER

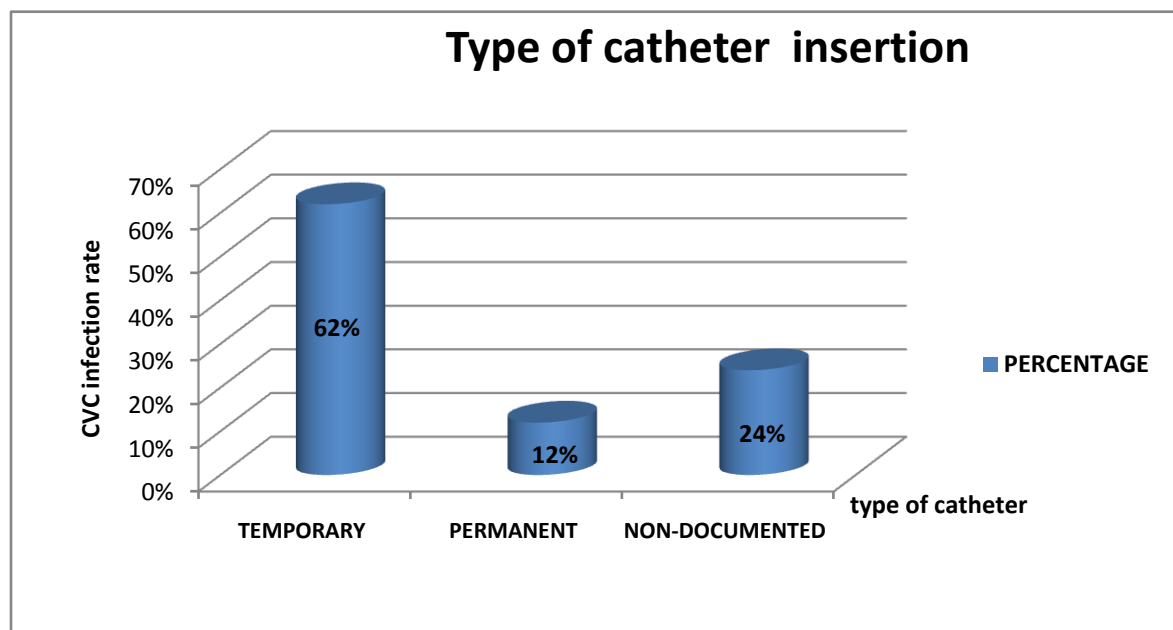


Figure 34 Figure 8 TYPE OF CATHETHER

DURATION OF CVC IN-SITU:

Average duration of central line in situ for dialysis patients was **6.25 days**

CENTRAL LINE INFECTION RATE:

$$\frac{\text{CLABSIs} = \text{No of central line associated Bloodstream infections.}}{\text{Central line days}}$$

$$=2/150$$

$$=0.0133$$

NOTE:

- During the audit report there were 2 incidence of central line infection of the patients who underwent dialysis.
- Causative organism responsible for the CVC infection was identified as klebsilla and pseudomonas for one of the instance.

STANDARD INFECTION RATE:

Since there is national comparison for the hospital, CLABSI incidence rates are used to calculate SIRs (Standard Infection Rate)

$$\text{SIR} = \frac{\text{observed cases}}{\text{Expected cases}}$$

The observed cases are the actual number of line infections (incidence rate numerator) and the expected cases are the number we expect to see if the average national CLABSI incidence rate was applied to each hospital patient population (the incidence rate's denominator).

Lower scores are better. An SIR score less than 1.0 means the incidence is better than expected.

Therefore the **standard infection rate (SIRs) for the hospital** is:

$$\text{SIR} = \frac{\text{observed cases}}{\text{Expected cases}}$$

$$= 2/2170$$

$$= 0.001$$

*(2170 were the predicted infections of CLABSI according national and state healthcare-associated infections standardized infection ratio report 2012).

NOTE:

Thus, it is found that the CLABSI rate is quite less (0.001) as compared against the international standard which is 0.557.

MULTIPLE CVC INSERTION:

It was observed that there were **2 (6%) instances** of multiple insertion of central line during this audit report.

CONCLUSION:

This report presents a set of summary statistics for CLABSIs in dialysis unit of Narayna Multi-specialty Hospital for the quarterly period of January 2014 to March 2014.

It is found that the CLABSI rate is quite less (0.001) as compared against the international standard which is 0.557.

However instances of multiple insertions can be reduced to zero by means of proper training and skilled professional.

Overall, there is still substantial opportunity for improvement across and reducing the central line infections to zero.

REFERENCES:

1. http://www.safetyandquality.health.wa.gov.au/docs/squire/HP11562_CENTRAL_LINE_WEB.pdf.
2. NHSN CLABSI information at http://www.cdc.gov/nhsn/psc_da.html
3. http://www.cdc.gov/hai/pdfs/SIR/SIR-Report_02_07_2013.pdf
4. . <http://www.aricjournal.com/content/2/1/33>
5. http://www.jointcommission.org/assets/1/18/CLABSI_Monograph.pdf
6. Silow-Carroll_synthesis_report_CLABSI_WNTB
7. Prevention of intravascular catheter related infections. Ann Intern Med. 2000 Mar 7;132(5):391–402. Erratum in: Ann Intern Med. 2000 Sep 5;133(5):395.
8. <http://jama.ama-assn.org/content/304/18/2035.full.pdf>
9. VD,guzman s,Migone O Crnich CJ.the attributable cost,length of hospital stay and mortality of centralline associated bloodstream infection in the ICUs. AM J Infect control.2003 dec(8)475-480
10. www.ihl.org.(institute for health care improvement)
11. www.cdc.gov/ncidod/scott_costpaer_pdf
12. http://www.cdc.gov/hai/pdfs/SIR/SIR-Report_02_07_2013.pdf