OPERATION THEATER UTILIZATION&EFFECIENCY

A dissertation submitted in partial fulfillment of the requirements
For the award of

Post-Graduate Diploma in Health and Hospital Management

By
(Dr Shruti)



International Institute of Health Management Research

New Delhi -110075

FEB-APRIL, 2010

OPERATION THEATER UTILIZATION&EFFECIENCY IN STERLING HOSPITAL AHEMDABAD

Post-Graduate Diploma in Health and Hospital Management

By
DR SHRUTI

Under the guidance of

DR PARAG RINDANI
CORPORATE HEAD
MEDICAL SERVICES
STERLING ADDLIFE INDIA LIMITED
AHEMDABD

DR DHARMESH LAL
Assistant Professor
IIHMR, New Delhi



International Institute of Health Management Research

New Delhi -110075

FEB-APRIL, 2010

ACKNOWLEDGEMENTS

I am ever grateful to **Mr. Rajiv Sharma (CEO- Sterling Addlife India Ltd.)** for instilling faith in me to carry out my training in Sterling Hospital-Ahmendabad.
I had a very rewarding and enriching experience during my training period

I express my sincere gratitude towards and **Dr. Parag Rindani (Head Medical Services Sterling group of Hospitals)** for permitting me to do the study in the hospital.
I also want to thank **Dr.Nikhil Lala (Medical administrator)** for his support and direction.
I sincerely thank **Mr. Dev Vyas (Manager – Training & Development)** and **Ms. Falguni Desai (Manager- HR)** for their continuous support during my training period.

I also want to thank all the nurse **incharges** and **nursing Staff** of Sterling Hospital-Ahmedabad, who has facilitated this study and in one way or the other have contributed to this project.

I am thankful to **Dr. Dharmesh Lal, Assistant Professor, PGDHM, IIHMR,** for his support throughout the entire course of study.

Certificate of Internship Completion

Date:……..

TO WHOM IT MAY CONCERN

This is to certify that Dr.SHRUTI has successfully completed her 3 months internship in our organization from February 1st, 2010 to April 30th, 2010. During this intern she has worked on OPERATION THEATER UTILIZATION&EFFICIENCY under the guidance of me and my team at STERLING HOSPITAL, AHEMDABD. …….

We wish her good luck for her future assignments

(Signature)
_____(Name)
_____Designation

Appendix 4

Certificate of Approval

The following dissertation titled "**OPERATION THEATER UTILIZATION&EFFECIENCY**" is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

Name	Signature
_____	_____
_____	_____
_____	_____

Appendix 5

Certificate from Dissertation Advisory Committee

This is to certify that **DR.SHRUTI** , a participant of the **Post- Graduate Diploma in Health and Hospital Management**, has worked under our guidance and supervision. She is submitting this dissertation titled "**OPERATION THEATER UTILIZATION&EFFECIENCY"** in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Faculty Advisor
Designation
IIHMR
New Delhi
Date

Organizational Advisor
Designation
Organization
Address
Date

ABSTRACT

OPERATION THEATER UTILIZATION&EFFICIENCY

BY

DR.SHRUTI

General Information about OT:

Location: Ground Floor /First Floor
No of OT,s: 7
Division: 2 Cardiac
: 3 General
: 2 Minor



In any hospital, the Operation Theatre (OT) is said to be the primary source of revenue generation with around 50-60 per cent of revenue earned just by this area. This is more so for surgical specialties. The OT complex in a hospital also represents an area of considerable expenditure in a hospital budget and requires maximum utilization to ensure optimum cost-benefit. In the best of hospitals, some 30-35 per cent of weekday OT capacity is not utilized, say experts. However, the situation is changing slowly. Today hospitals are keen on utilizing OTs better by streamlining key areas like manpower, scheduling, layout and designing[2].

Establishment of operating room rules and regulations, strict adherence to and enforcement of approved policies and procedures along with continuous monitoring are said to be the essential ingredients for efficient OT management. "Operating time is money and it is to be emphasized that efficiency in the operating room is encouraged. Effective operating theatre utilization for every hospital should be calculated. Every effort must be made to reduce the number of 'idle theatre hours',"

The major findings are:

1)Scheduling: Proper and judicious scheduling of cases and adhering strictly to schedule is important, as poor scheduling is often said to be the cause of lost OT time

To more efficiently operate a surgical setting, managers may consider centralizing scheduling to the OT suite itself. Ideally, holding patient and surgeon preferences constant, an operating facility can identify cases and appropriately place them into predetermined time slots, or blocks

The amount of time allotted to a surgeon should be tabled against the amount of time he actually operates in a theatre. This allows us to reschedule sessions, avoid under utilization of one area and over-running of other theatres.

2)Manpower: Staffing of the operating room, in terms of anesthetists, nurses and other support staff is important for efficient running of theatre and this number should be on par with the clinical activity. Experts also feel that the way forward in operation theatre management is to have a 'Theatre Management Group' with strong leadership and appropriate membership with authority to take action.

3) Staff efficiency: According to me, it is not a good idea to 'multi task' the staff in the OTs. Dedicated staff performing specific duties not only improves efficiency, but also increases job satisfaction. It is a common practice in India for nurses and the technicians to multi task in cleaning the equipment, the floor and the walls of the OTs in tandem with other administrative staff.

4) Cancellation/Postponement of Surgery

It is deeply distressing to a patient to have an operation postponed on the day of surgery and economically wasteful both for the patient and for the hospital.
Many cancellations could be avoided with good pre-operative assessment, effective bed management and better communication between patient and hospital, and between staff groups within the hospital. From my point of view the management team should undertake a regular review of all cancellations.

.

5) Streamlining Work Flow: ORs are choked by paperwork. During the interoperative period alone, nurses must fill in an average of 15 pieces of paper per patient. Manual processes can lead to errors in reimbursement and take up valuable time that nurses could be using to provide care.

6) Standardization of procedure equipment: If we standardize each set of equipment then chances of lack of instrument during surgery and mistake of instrument get packed inside the body of patient will reduces significantly

Content Page No.

Acknowledgement	3
Abstract	6-7
Table of content	8
List of figures	10
List of tables	11
List of appendix	12
List of abbreviations	13

List of figures

Ot utilization rate
Rate of cancelation
Rate of prolongation
Rate of adherence
Total surgeries
Delay rate
Staff: overtime, Training status, number

List of tables

Incentive hours
Regular/extra duty
Cancelation
Adherence to allotted time
Total surgeries
Staff: training status
Utilization per month per operation theater

List of Appendices

Ot: operation theater

Incentive: extra

Feb: February

OR: Operation room



Internship report

About the Sterling hospitals:

STERLING ADDLIFE INDIA LIMITED came into existence with effect from 29.12.2000 as a Limited Company registered with the office of the Registrar of Companies; Gujarat. Sterling Addlife India Ltd. is a dominant player and premier healthcare service provider in Gujarat. It has become one of the leading regional healthcare companies in India. The philosophy of the company remains to be patient centric, follower of ethical medical practices, and a provider of world class healthcare to global clientele.

Sterling Hospital, owned and managed by Sterling AddLife India Ltd., is the leading hospital chain in Gujarat.
It is engaged in providing high quality medical and surgical care in a host of critical specialties such as Cardiology and CVS surgeries, Neurology and Neuro-surgeries, Nephrology and Kidney Transplant, GI Medicine and Surgeries, Hematology, Oncology and Onco-surgery, Critical and Emergency Care, Trauma and Orthopedic, Neonatology as well as General Medicine and Surgeries.
Sterling has two multi-specialty tertiary care hospitals, one each at Ahmadabad and Vadodara and three satellite centers, one each at Kalol, Mehsana and Himmatnagar.
The company has STERLING HOSPITAL, a multi-super speciality hospital in Ahmedabad – with 310 beds, 7 major operation theatres and 84 ICU beds.
The company has also taken over Sterling Hospital, Vadodara which is having all multi-super-specialty facilities.
Sterling's high quality services attract patients from Gujarat, Rajasthan, Madhya Pradesh, Maharashtra and even from outside the country. Sterling proposes to cross the 1000-bed mark with additional state-of-the art hospitals planned at Rajkot, Surat and Bhavnagar by 2010. Sterling is also focused on clinical research and medical education through DNB programs. As a part of Sterling's ambitious growth plans, Actis, the well-known Private Equity Firm, has recently acquired a significant equity stake in Sterling AddLife India Ltd.

Sterling has taken up 2 green field projects at Rajkot and Bhavnagar. The estimated cost of Rajkot project for setting up a 160 bed hospitals is kept at Rs. 75 Cores. The company has acquired a piece of commercial land at Bhavnagar for setting up a medium sized 120 beds capacity (expandable up to 130 beds) hospital with estimated cost of project of Rs. 46 Cores.

My work in sterling:
Feb 1st to 28 feb:
visited different departments and understand the work flow

Date:2/2/10 -3/2/10
Department: human resources
Subject: induction and orientation
Point of contact: Mr. Arpit Patel
:Mr. Arpit Hathi
:Mr. Deep
:Mr. Dev Vyas
:Miss Mona
:Miss santosh

Area /Subject observed: brief idea about hospital background
: brief idea about hospital policies
: brief idea about HR policies
: training on fire extinguisher uses
: training on CPR
: written exam on training

Date: 3/2/10
Department: corporate office
Point of contact: Mr. Parag Rindani
Important task: discussed about area of interest and allotted place of training

Date: 4/2/10
Department: Radiology
Subject: process overview
Point of contact: HOD-Dr Priyank
: Chief technician-Anil
: Technician-Raksha
: Recepitionist-Ketur
Area /subject observed: X-ray unit processing
: CT-unit processing
: Mammography unit

Process observed: X-ray module
: mannul register for audit
: peak hours-9amto1pm
-4pmto 7pm

: Privilege card facility

Remark: no smoke detector
: condemn machine in lobby

Date:5/2/10
Department: medical record department
Subject: process overview
Point of contact: Dr Nimish Parikh

Area observed: medical record checking
: Segregation of MLC and IP files
: Coding and storing of files
: NABH norms
: sterling standard`s
: MIS report
: quality indicator`s
: Death and birth certificate
: Railway concession form
Remark: less space
: Single fire exit

Date: 5/2/10
Department: OPD
Point of contact: Miss Anita
Area observed: decentralized appointment station
: OPD sheet
: registration process

Date: 5/2/10
Department: IT
Subject: overview of function
Point of contact: Mr.P. R. Narayanan
Area observed: HMIS –careworks2001
Process observed: different types of module
: Intranet
: E-mail management

Date: 6/2/10
Department: billing
Subject observed: overview of functioning
Point of contact: Anita
: Mitesh
: Bhumi

Area observed: OP billing
: IP billing
: TPA desk

Process observed: work flow

Remark: can use rubber stamp on TPA form instead of writing about estimation every time

Date: 8/2/10
Department: infection control
Subject / area observed: infection control and surveillance
Point of contact: Mr. Meetesh
: Miss Jinal
: Miss Heena

Process observed: swab culture test
: Surveillance kit
: Vaccination record
: Calculation of UTI, VAP, BSI
: surgical site infection calculation

Date: 9/2/10
Department: Bio Medical waste management department
Point of contact: Miss Heena
Subject observed: surveillance report
: Segregation process
: audit report
: register maintenance
: dispatch system for final disposal

Date: 10/2/10
Department: supply chain
Subject observed: supply chain management
: Inventory control

Point of contact: Mr. Bhagat
Area: CIOD
: Pharmacy store
: General store
: Stationary store

Process observed: Good note register
: Receive and dispatch procedure
: Pharmacy inventory management

: Food & general store
: Intending and sending items to nursing station
: physical verification of stock

Date: 11/2/10
Department: Physiotherapy department
Subject: Process work flow
Point of contact: Mr. Vinod Patel
Location: Ground floor
Observation: equipments
: Case sheet and assement sheet
: visit planning

Date: 12/2/10
Maha Shiv Ratri leave

Date: 13/2/10
Department: linen and laundry
Subject: linen management
Point of contact: Mr. Gulab Singh
: Mr. Kamal
Area observed: laundry area
: sub store

Process: sorting
: washing
: Hydro extraction
: Chemical used
: Distribution
: Bed making
: Kit distribution

Date: 15/2/10
Department: Biomedical eng
Point of contact: Mr. Mukesh Patel
Area observed: calibration
: Preventive maintenance
: Corrective maintenance
: Id generation for each equipment
: History sheet maintenance

Date: 16/2/10
Department: Food and beverages
Point of contact: Miss Sadhana
Area observed: Therapeutic food assessment card
: Food preparation area
: Color card system for differentiation in meal type
: Quality control
: 7 meal service

Date: 17/2/10
Department: Housekeeping and security
Point of contact: Mr. Shiv Kumar(security)
Process observed: reporting system
: Metal detector
: Fire alarm control panel
: Smoke detector

Point of contact: Mr. Girish
Process observed: staffing
: Attendance
: shifts maintenance
: Facilities for contracted staff

Date: 18/2/10
Department: Front office
Point of contact: Miss kinjal
: Miss Nipa
Process observed: Admission module
: Help desk system
: Admission system
: Visitor passes allotment

Date: 19/2/10
Department: Pharmacy
Area observed: Pharmacy store
Process observed: intend receiving
: Segregation of medicines
: Dispatch of medicine
: Storage of temperature sensitive medicine
: Manual checking and counting of every product
: discard procedure for expiry medicine

Date: 20/2/10 -22/2/10
Department: Human resources
Point of contact: MR. Dev Vyas
: Miss Falguni
: Mr. Arpit Patel
: Mr. Arpit Hathi

Area observed: File management
: Performance appraisal system
: Resume data base management
: Training record
: Contracted staff management
: Project comet
: Compensation survey
: Recruitment procedure
: HR Calendar
: OJT file management
: Assessment form

Date: 23/2/10
Department: Piped medical gases
Point of contact: Mr. Hasmukh
Area observed: MCP at parking
: sub store at ground floor

Process observed: Calibration via rotameter
: Allotment of small cylinder
: Preventive maintenance

Date: 24/ 2/10
Department: marketing
Point of contact: Mr. Beer Singh
Area observed: Marketing verticals
: branding
: Corporate
: Trade

Date: 25/2/10
Department: nursing
Point of contact: Hitarthi

Area observed: Verbal order policy
: ordering of medicine for patients
: Staffing pattern
: Crash cart
: Different type of register maintenance

Date: 26/2/10
Department: quality &accreditation
Point of contact: Dr Nimish Parikh
: Miss Mona
Area observed: quality system
: Quality safety indicator
: Committee meeting
: Internal assessment

Date: 27/2/10
Department: pediatric and neonatal ICU
Point of contact: Miss Divya
Area observed: neonatal ICU
: Pediatric ICU
: Pediatric ward
: Feeding area
Process observed: neonatal care
: parent meeting
: gown changing system

Date 1/3/10 to 30/4/10
Department: Operation Theater

Dissertation on "OPERATION THEATER UTILIZATION&EFFICIENCY "



1. Introduction

• The key elements in the efficient use of operating theatres are: effective management ,good communication, trained staff, appropriate facilities, equipment, and operational layout.
• Good utilization depends on a complex interaction between the availability of personnel and resources and on the attitudes and good practice of all staff involved.
• Efficiency in theatre is inevitably influenced by a huge range of surrounding resources such as pre-operative planning and assessment, beds, theatre sterile supply unit (TSSU) capacity and staffing levels in other disciplines.
• A good system of planning and scheduling in theatre will enable more work, including emergencies, to be carried out at a reasonable time, improve the patient and doctor experience, and improve employee satisfaction and moral.

In any hospital, the Operation Theatre (OT) is said to be the primary source of revenue generation with around 50-60 per cent of revenue earned just by this area. This is more so for surgical specialties. The OT complex in a hospital also represents an area of considerable expenditure in a hospital budget and requires maximum utilization to ensure optimum cost-benefit. In the best of hospitals, some 30-35 per cent of weekday OT capacity is not utilized, say experts. However, the situation is changing slowly. Today hospitals are keen on utilizing OTs better by streamlining key areas like manpower, scheduling, layout and designing[2].

Establishment of operating room rules and regulations, strict adherence to and enforcement of approved policies and procedures along with continuous monitoring are said to be the essential ingredients for efficient OT management. "Operating time is money and it is to be emphasized that efficiency in the operating room is encouraged. Effective operating theatre utilization for every hospital should be calculated.

Although demand for surgical services may be growing, its margins are not. On the surface, it may appear that OR suites are fully utilized and that processes are running smoothly, but when organizations dig deeper, they may see substantial rifts—gaps in organizational data, lack of consistent standards in care and resource use, and ineffective use of personnel and other resources due to poor scheduling and sequencing of events—all of which negatively affect the bottom line. So what's causing these inefficiencies? Most can be tied directly to the lack of an enterprise wide care delivery system that integrates the data and processes of the many functional areas that feed into the OR.

To successfully achieve system integration within the OR, it is necessary to explore the need for integration, define its components, and, ultimately, show its benefits.
The integration of resource management activities within and across the enterprise allows organizations to gain many advantages:

•*Improved profits* through better decision-making, reduced costs.
•*Performance management improvements* based on access to real-time, enterprise wide data.
•*Maximized resource utilization* through reduction of scheduling gaps and delays.

•*Streamlined work flow* by elimination of redundant and manual processes.
•*Supply cost reductions* through standardizing product use and choices, increasing contract compliance, and taking advantage of rebate opportunities; and
•*Enhanced care delivery* through better integration of and access to patient care data

General objective: TO Find out utilization rate of Operation Theater AT STERLING HOSPITAL.

Specific objective: Maximizing OR utilization and streamlining work flow.

Rationale of Study: It's an area in that organization where an intense improvement is required.

METHODOLOGY:
TYPE OF STUDY: RETROSPECTIVE
TYPE OF DATA: SECONDARY(FROM REGISTERS)
METHODS OF DATA COLLECTION: FROM BOOKING REGISTER
: INSENTIVE HOUR REGISTER

DATA ANALYSIS: TOOL MS EXCEL: The data was analyzed in MS Excel to calculate Operation theater Utilization, incentive hours of employees, cancelation rate, delay rate and equipment count.

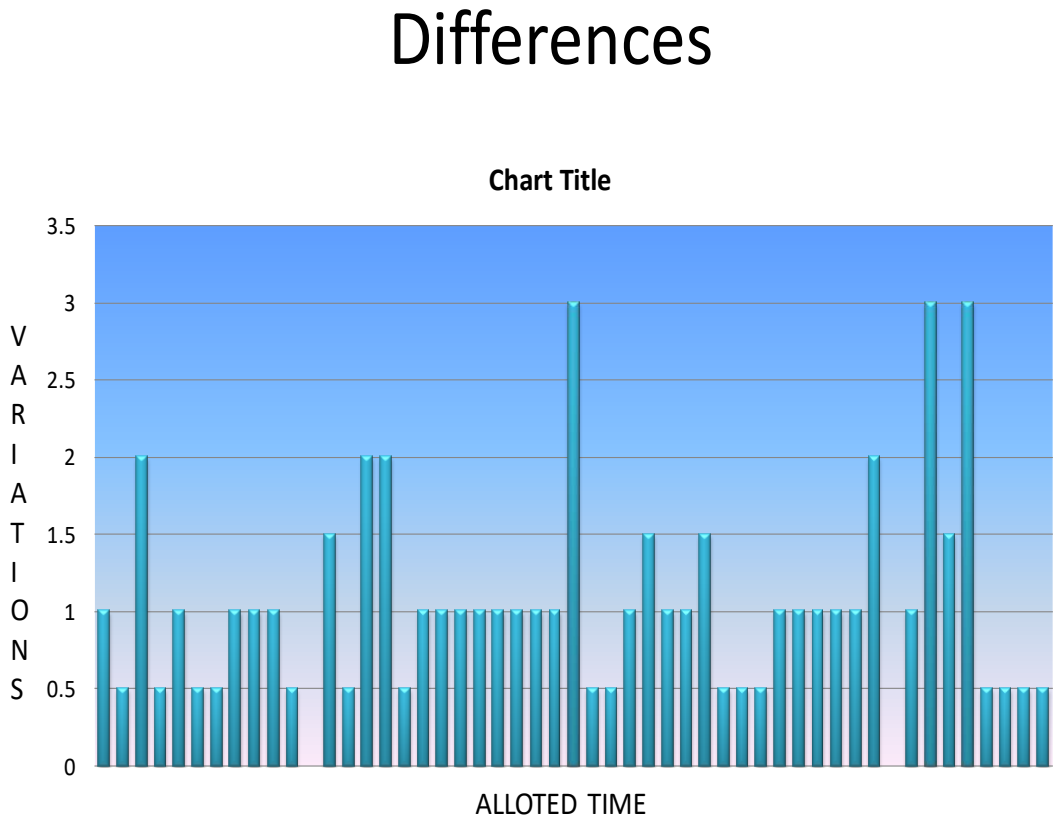
VARIABLES STUDIED: SAMPLE SIZE

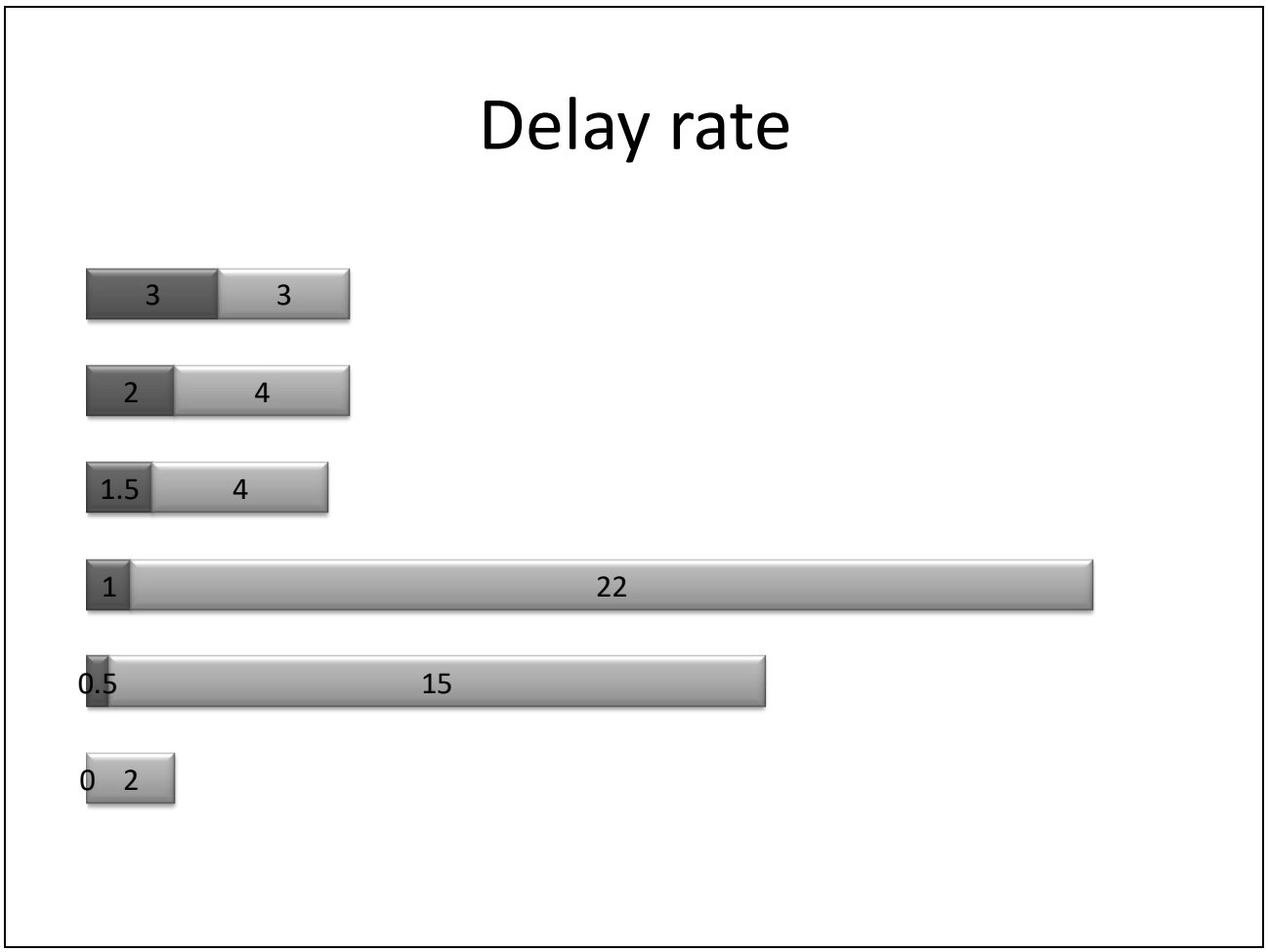
1:DELAY RATE :50 CASES(REASON MOST REPEATED SURGERIES)
2:MANPOWER EFFICIENCY :14 NURSES(TOTAL MANPOWER AVAILABLE)
3:CACELATION RATE :OUT OF TOTAL 518 SURGERIES(TOTAL NO. OF SURGERIES IN TWO MONTHS FEBRUARY AND MARCH)
4: OPERATION THEATER UTILIZATION: FOR 7 OT,S IN MONTH OF FEBRUARY AND MARCH.

RESULTS AND FINDINGS:

1: DELAY RATE:

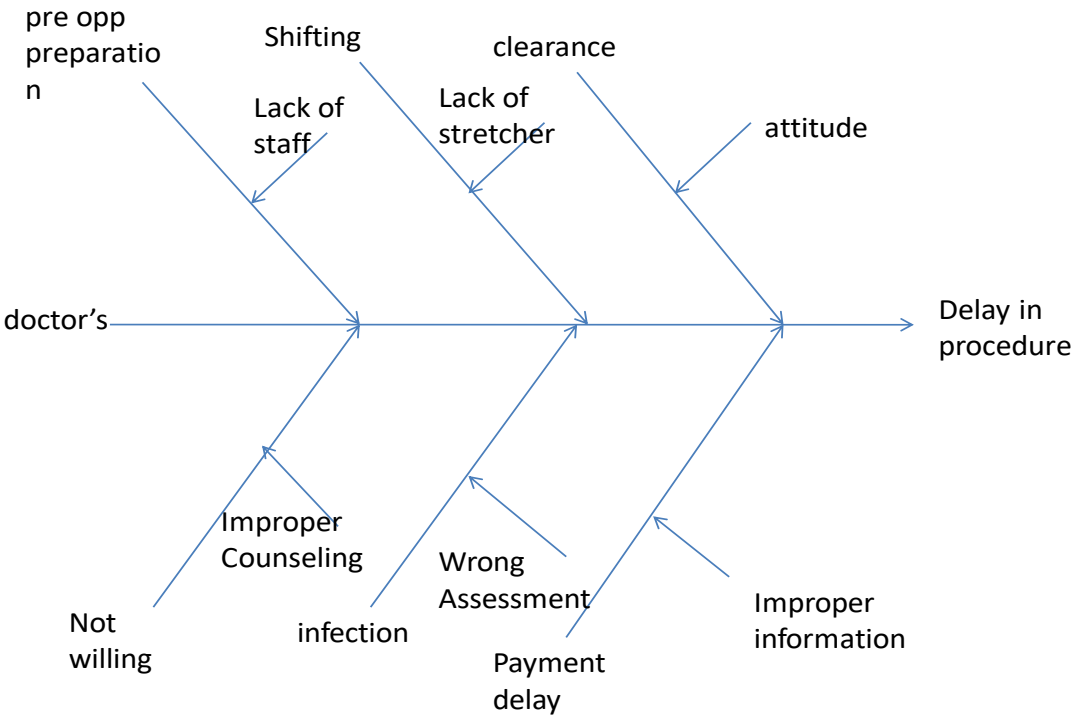
Difference(hr)	Cases(no.)
0	2
0.5	15
1	22
1.5	4
2	4
3	3





In sterling hospital delay in procedure because of many reason to know the cause I have done root cause analysis

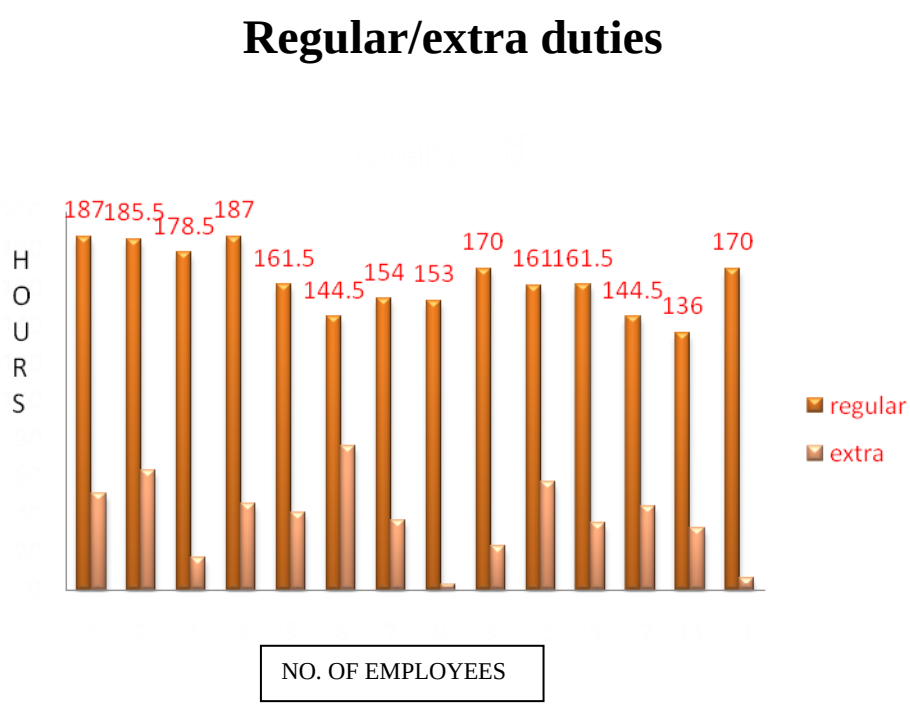
Root cause analysis

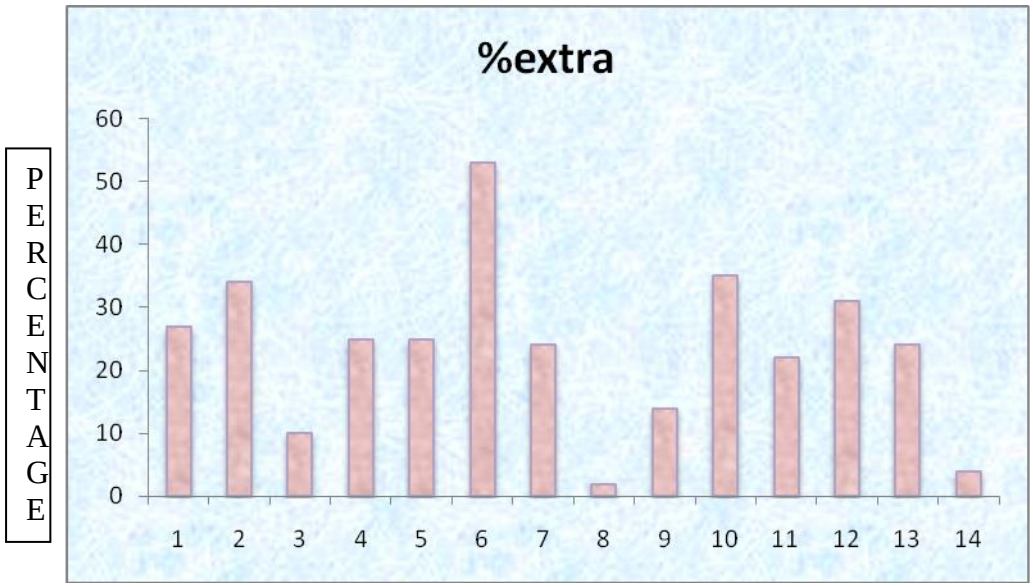


Conclusion by this analysis: delay in procedure can be minimized by proper counseling, changing attitude of employees towards their duties and proper allotment of patient transfer trolley.

2)Manpower:

In this graph I have shown extra duties verses regular duties. For details please check annexure -2





These extra duties also can be reduced by increasing moral of staff .Being made to feel a valuable part of the team, working in a well managed, efficient theatre will improve morale and increase staff retention.

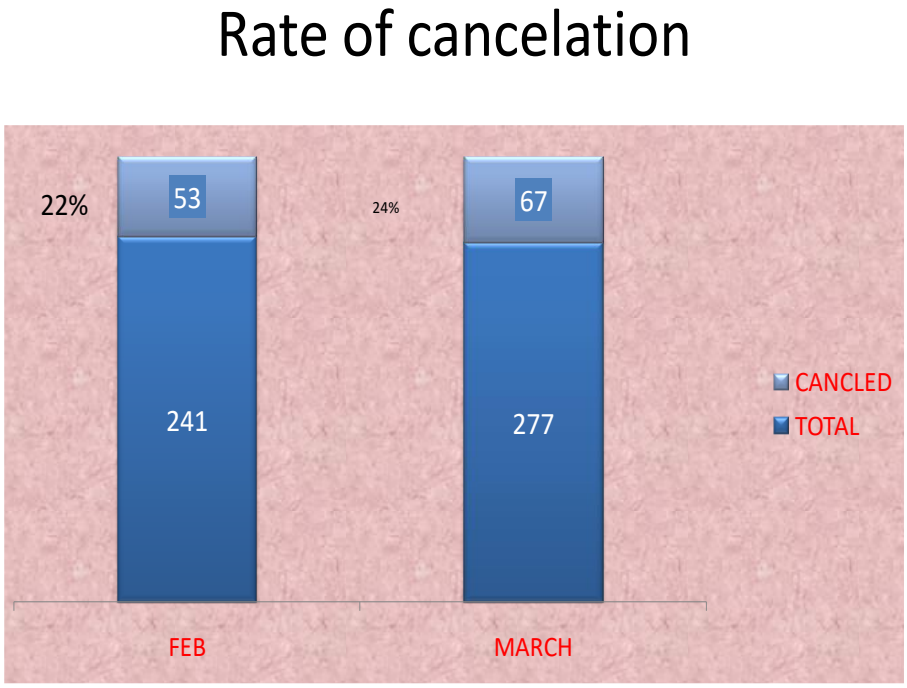
To reduce this problem I have prepared duty roster plan for operation theater staff. This plan is for 16 staff member for 5 ot.

PROPOSED PLAN

Duty roster

	Morning						Evening						Night		Extra		
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
M	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
T	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P
W	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
TH	A	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P
F	P	A	A	P	P	P	P	A	P	P	P	P	P	P	P	A	P
S	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	A
SU	P	P	P	P	A	A	P	P	A	A	A	A	A	P	P	P	P

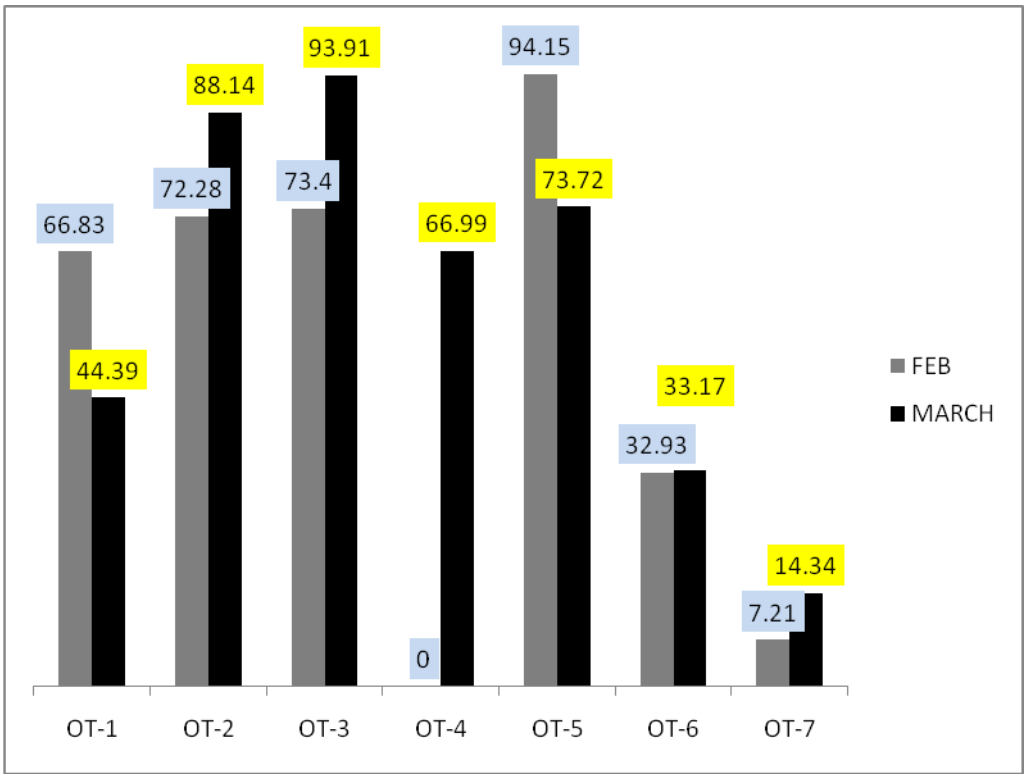
3) Cancelation rate



Operating Room Utilization

Operation theater utilization at sterling hospital (Feb-march)

	FEB	MARCH
OT-1	66.83	44.39
OT-2	72.28	88.14
OT-3	73.4	93.91
OT-4	0	66.99
OT-5	94.15	73.72
OT-6	32.93	33.17
OT-7	7.21	14.34


66.83
44.39
72.28
88.14
73.4
93.91
0
66.99
94.15
73.72
32.93
33.17
7.21
14.34
OT-1
OT-2
OT-3
OT-4
OT-5
OT-6
OT-7
FEB
MARCH

CONCLUSIONS

Data Integration is Key to Success

Improving operating room efficiency must be data-driven. A recent study identifies the shortage of comprehensive data, as well as common counting rules and standards, as a major barrier to proper analysis of an OR's performance.

Without a thorough understanding of where changes need to be made, organizations can't make the reforms necessary to increase efficiencies and profits.

To fully grasp the big picture, what's needed is a wholly integrated approach to data and information capture within the surgical suite and throughout the enterprise. When OR managers gain access to enterprise wide data, they can create a cycle of continuous improvement—analyzing shortcomings, instituting changes to drive improvement, and finally, accessing the success of those changes to determine if additional action needs to be taken. Systems integration within the OR helps achieve new efficiencies and profits in two key ways:

•Maximizing OR utilization;

•Streamlining work flow.

Maximizing Resource Utilization

Operating rooms generate about 50 percent of a hospital's revenues. This is an impressive figure. But data suggest this figure could be higher[3].

A recent industry study shows that *the average OR runs at only 68 percent capacity.* And because many OR resources can be considered "fixed" expenses, improving through put by just one additional procedure per day per OR suite can generate anywhere from $4 million to $7 million in additional annual revenue for the average-sized organization.

How can surgical services increase throughput? By implementing a centralized system that improves scheduling efficiencies and establishes common clinical pathways.

An integrated scheduling system helps ORs improve resource utilization, increase capacity, and enhance throughput through:

•*Real-time, integrated scheduling data* so schedulers can maximize utilization of resources—people, equipment, supplies, and facilities;

•*Identification of conflicts up front,* so problems can be resolved before delays begin; and

•*Proper ordering of supplies/equipment,* so what's needed is readily available (especially critical for special-needs patients, such as those requiring specific equipment).

1) Scheduling

Statistics show that ORs have room for huge improvements in scheduling-related issues, such as start times and turnover rates. The average OR starts on time only 27 percent of the time.

Delays can be attributed to factors that range from simple to complex.

For example, in many ORs, the first case of the day often doesn't start on time, causing cases for the remainder of the day to start late as well. Or perhaps the right supplies and equipment are not readily available—causing an average 15-minute delay per episode of care.
Inefficient turnover of the room can cause the next event to be delayed.
Efficient clean-up and set-up are essential, but not exclusive, ways to improve turnover.
An integrated scheduling system can help automate manual steps and eliminate duplication of nursing efforts, freeing nurses to prepare for the next case.

Sometimes delays are justifiable, but being able to get to the root cause of the variance will help create a cycle of continuous improvement so future delays can be minimized.

2:MANPOWER

Staffing of the operating room, in terms of anesthetists, nurses and other support staff is important for efficient running of theatre and this number should be on par with the clinical activity. Experts also feel that the way forward in operation theatre management is to have a 'Theatre Management Group' with strong leadership and appropriate membership with authority to take action.

Staff efficiency: According to me, it is not a good idea to 'multi task' the staff in the OTs. Dedicated staff performing specific duties not only improves efficiency, but also increases job satisfaction. It is a common practice in India for nurses and the technicians to multi task in cleaning the equipment, the floor and the walls of the OTs in tandem with other administrative staff.

OR hours, or 1 hr extra duty 1hr/8.5hr=11.6% which is then multiplied by the additional cost of staying late which often is assumed to be a factor of two (related to monetary overtime cost paid to staff, as well as recruitment and retention costs related to unhappy staff because they have to stay late unpredictably). OR suites can reasonably aim to achieve a staffing cost that is within 10% of optimal (i.e., workload is perfectly matched to staffing).

If the key is to allocate appropriate time to each service based on historical OR use, how do you deal with rooms consistently running late on the day of surgery? The answer: make the allocated time, into which cases are being scheduled, longer. For example, if a surgeon does 12 hrs worth of cases every day he is in the OR, don't plan 8 hrs of staffing (7am-3pm) and have everyone frustrated by having to stay late (overtime). Rather, schedule his cases into 12 hrs of allocated time (7am-7pm). That way, anesthesia and nursing staff know they will be there 12hrs when they arrive to work and overtime costs (financial and morale) will be reduced. The common response to this approach is, "No one wants to be there till 7 pm." The answer to that is, "You are there now till 7 pm so why not make scheduled OR time 12 hr long and have more predictable work day duration." Thus, optimizing staffing costs is finding balance between overtime and finishing early.

There may be concern about a nurse manager's ability to flex the staff enough to avoid excess staffing costs. It can be difficult from a human resources standpoint to match scheduled cases with staffing perfectly, such that staff still gets the hours and shifts they need. . For example, if Dr X needs a 12-hour block, the manager needs to find staffs who

want to work a 12-hour shift (or part-timers in some combination). Staffing is not only an OR efficiency issue, but a staff satisfaction issue. It can be a challenge at a time when recruiting and retaining nurses are growing concerns

In sterling hospital because of miss management of staff duties and lack of staff cause many problems. In result of this entire staff does extra duty and some of them more than 50% extra in comparison of regular duty[4].

From my point of view this can be minimized by proper scheduling staff duties.

3:CANCELATION RATE:

Cancellation rates vary among facilities, depending partly on the types of patients receiving care, ranging from 1surgery up to 4 surgeries. Many cancellations are due to doctors wish and patient's condition, surgeon unavailability. OR cancellation rates can be monitored statistically. Well functioning OR suites should have cancellation rates less than 5%. Monitoring the cancellations correctly is calculated by taking the ratio of the number of cancellations to the number of scheduled cases[4].

At sterling hospital I have analyzed data for two month and calculated that cancelation rate varies between 22% to 24%.

Because of cancelation many problems arises like sometime staff not inform anesthetic and they reach at operation site and start shouting, other problem like that slot can be used for another surgery.

From my point of view cancelation problem can be reduced by

- It is deeply distressing to a patient to have an operation postponed on the day of surgery and economically wasteful both for the patient and the hospital.
- Many cancellations could be avoided with good pre-operative assessment, effective bed management and better communication between patient and hospital, and between staff groups within the hospital
- Close communication and co-ordination between the pre-operative area and theatre using agreed procedures is essential.
- A receptionist and/or theatre manager should liaise closely with ward and transport staff. Electronic links sending for and identifying patients may be used.
- Up-to-date information about operating lists must be available and all personnel informed of any changes as soon as they are decided.
- The incidence and reason for all cancellations, delays and overruns should be logged and reviewed by the theatre management team
- Realistic scheduling of procedures will avoid cancellation of operations.
- Potentially long operations should be identified and planned in such a way that it is possible to complete them within the time available.

Dealing with the patient whose operation has to be postponed for non-clinical reasons:

• Local procedures should be developed for dealing with cancellation of surgery at short notice. A senior member of the team should visit the patient as soon as possible after the decision is made and offer an appropriate apology and an explanation.
• The patient should be provided with something to eat and drink as soon as possible, access to a telephone and offered help with arrangements for transport home if appropriate.
• There should be full documentation of the reasons for cancellation, the explanation given and any action taken in the patient's record.

Dealing with the patient whose operation is cancelled for clinical reasons:

• It may be necessary to cancel an operation because of a new or inadequately treated medical condition, or exacerbation of chronic illness.
• Most pre-existing medical conditions should be detected and treated following screening and/or in the pre-operative assessment visit, providing pre-assessment is carried out within two weeks of admission.

• In the event of the system failing, the patient deserves an appropriate apology and an explanation.

• It is unacceptable to cancel surgery without arranging suitable referral or treatment. It is the responsibility of the clinician to document exactly what investigations and/or treatment are required and the responsibility of the preoperative assessment team to ensure that this is carried out.• A review of the reason for failure of the system should be carried out.

4) Streamlining work flow

Workflow within the OR has certainly advanced since then, but, unfortunately, it hasn't advanced enough in certain areas. For example, ORs are choked by paperwork. During the interoperative period alone, nurses must fill in an average of 15 pieces of paper per patient. Manual processes can lead to errors in reimbursement and take up valuable time that nurses could be using to provide care and expedite patient throughput.

Health care can take a clue from other industries, such as package delivery and retail that have significantly improved work flow through automation. Federal Express generates nearly all its air bills electronically, eliminating errors that could cost millions of dollars per year. The company can electronically track any package mailed at any of its thousands of locations, anywhere in the world, instantly. Wal-Mart uses information technology to keep its shelves fully stocked and its inventory turns incredibly fast. The resulting high-availability, low-cost merchandise makes the company a retail leader. Healthcare organizations reap many benefits when they automate processes:

•*Improved efficiencies and decision-making* through automated documentation and development of clinical pathways throughout the entire preoperative continuum.
•*Enhanced nursing satisfaction* through elimination of manual processes, thereby freeing up more time for patient care.

•*Reduced costs* through standardization of product selection/usage, enhanced OR inventory management, and reduced overtime caused through poor scheduling or case delays; and
•*Increased revenues* through optimized through put and improved charge capture.

5)Standardization of equipments:



Equipments for each and every procedure are very vast in number and counting of them and cleaning of them is time consuming but necessary. So standardization of equipments for each and every procedure will help hospital in following ways:

1) Counting will be easy
2) No need to open another set during surgery.
3) Extra instruments can be kept separately after ETO.
4) Saving autoclave cycle time: by not opening another set during particular surgery
5) Cost saving: autoclave cycle cost.
   : manpower cost
6) Time saving
7) Consultant satisfaction

OR utilization is a measure of the use of an operating room that is properly staffed with people needed to successfully deliver a surgical procedure to a patient.

Raw utilization is the total hours of elective cases performed within OR time divided by the hours of allocated block time.

Raw Utilization = total hours of cases performed ÷ total hours of OR time allocated

Factors affecting utilization rates include:

The accuracy of estimated case times,

Cancellation rate,

number of add-ons available to fill gaps,

whether longest cases go first, the time of day as utilization typically is highest in the morning and lowest in the evening, outpatient centers have lower utilization, and other constraints .

Improvements in operating room efficiency can have a major impact on hospital staff and finances as well as operating room management.

Operating Room Efficiency

Operating room (OR) efficiency is a measure of how well time and resources are used for their intended purposes. One way to analyze efficiency is to chart *under-utilized* and *over-utilized* time spent on a given day in the operating room.

If the cases in an operating room finish earlier than scheduled, time is *under-utilized*. Likewise, if the cases in an operating room run "late" or past its allotted operating room time then this produces *over-utilized time*

The terms *operating room utilization* and *operating room productivity* are also often used when discussing operating room management of a surgical suite.

RECOMENDATIONS

1:Theatre Management Structure

• There should be a single **Director of Theatre Services** with full budgetary authority, adequate seasonal allowance, accountability, information systems, and administrative and secretarial support.

• The director should be a senior member of staff , with a clear understanding and experience of working in operating theatres and ability to take a broad view across various specialties.

• Where budgets are devolved to specialist services or departments in the trust, robust mechanisms must be in place to ensure accountability and safe running of the theatres services as a whole.

• Day-to-day running of theatres should be in the hands of a **Theatre Manager**, a senior nurse or ODP who works within the theatre complex, has no conflict of duties and is directly accountable to the Director of Theatre Services.

• The theatre manager should be responsible for maintaining communication with staff groups, and ensuring competent staffing and suitable equipping of all theatres.

• There should be a system for planning theatre activity to allow the theatre manager to allocate staff efficiently, and to respond safely and flexibly to changes in routine. This will involve close co-operation with surgeons and anesthetists.

• The theatre manager should develop local policies to ensure that planned surgical activity in printed or electronic form is clearly posted, well in advance and in all appropriate locations. It should include starting time, running order, the names of the operating surgeon and anesthetist, and the consultant surgeon and anesthetist in charge.

• Policies should be developed for dealing effectively with changes in published operating lists.
• Where surgical activity is carried out in widespread locations within the hospital it is important that close co-operation, at medical, nursing, ancillary and managerial level, exists between all theatre areas.
• The theatre management team should regularly audit utilization, cancellations, list overruns and late starts.

Ultimately, a manager may improve hospital functioning by providing rewards and incentives for improved efficiency, assessing logistical and system design, delegating responsibility, and implementing teamwork initiatives

2: Operating List management

• Close communication and co-ordination between the pre-operative area and theatre using agreed procedures is essential.
• A receptionist and/or theatre manager should liase closely with ward and transport staff. Electronic links sending for and identifying patients may be used.
• Up-to-date information about operating lists must be available and all personnel informed of any changes as soon as they are decided.
• In theatre, a suitably staffed and equipped holding area for patients will assist with the smooth running of the lists.
• Patients must be ready for theatre when they are sent for and theatres should liase closely with the ward and bed manager at all times, particularly if the order of the operating list has been changed.
• The incidence and reason for all cancellations, delays and overruns should be logged and reviewed by the theatre management team.
• Policies on, for example, fasting, anticoagulation, shaving, dentures, jewellery,appropriate underwear and removal of make-up should be developed, applied and audited.
• Unsedated patients can walk to theatre with a patient escort. Otherwise patients need to be transported on a bed, trolley or wheelchair.
• Units should develop policies to decide what level of training is appropriate for patient escorts
• It is important that sufficient transfer staffs are available during all operating times and that they are based in theatre with no other conflicting duties.

Consideration should be given to a flexible system in which staff from other areas of theatre provides transfer assistance when possible.
• All personnel involved in transfer of patients, including medical staff, should receive instruction in moving and handling.
• There must be a documented system of identification and handover of the patient.
• Multiple checks can increase patient anxiety and cause confusion and should be reduced to a safe minimum.
• As well as wristband identification, it is important that, where possible, patients identify themselves actively e.g. state their name and date of birth. This also applies to confirmation of ‘side’ of operation.

• There is little evidence to show that inside and outside trolleys reduce infection or that taking beds into theatre increases it, providing the bed linen is changed prior to transfer. Providing the bed or transfer trolley can tip and is of adjustable height, patients can be transferred directly to the anesthetic room.
• The recovery unit must be suitably staffed and equipped, be of sufficient capacity and remain open during all periods of activity. Shift patterns should pay attention to the peaks of activity occurring mid morning and afternoon and the later start and finish to the normal working day compared to theatres.
• High dependency and intensive care units should have agreed admission and discharge policies to prevent blockage of beds. A lead clinician in Critical Care, using established guidelines and ensuring proper communication between staff groups, can provide a vital

role . A system of booking elective admissions should be in place although a check of bed availability must be made before proceeding with anesthesia for elective surgery.

3:Effective Utilization of Theatre Time for Surgery

• It is important that all lists begin and end at times agreed and adhered to by all theatre users. **The advantages of this include:-**

• Anesthetists will have time to visit patients pre-operatively before the agreed start of the operating list.
• Timely preparation of patients for theatre.

• Increased ability to match staff to workload in theatres and recovery units.

• Staff can take meal breaks, reducing fatigue

• A reduction in the need for overtime

• A prompt start in the afternoon with less chance of overrun into the evening.

• Realistic scheduling of meetings, professional and other commitments.

• The start of a theatre session is defined as, ‘when the anesthetist takes charge of the (first) patient in preparation for anesthesia’ and the end as, ‘when the anesthetist has finished handing the (last) patient over to recovery staff and is free to start another task’.

• It is important that lists are scheduled in such a way that surgical and anesthetic time is synchronized. For example, infectious patients should be put on the end of the list to avoid delays caused by contamination of the theatre; patients requiring only local anesthesia administered by the surgeon and no monitoring by an anesthetist, at the beginning or the end of the list. Pooling of such patients onto one list may enable the anesthetist to be reallocated.

• Realistic scheduling of procedures will avoid cancellation of operations. Potentially long operations should be identified and planned in such a way that it is possible to complete them within the time available.

• Computerized collection of data on operating times of individual surgeons and anesthetists for different procedures makes it relatively easy to predict probable overruns and automatically flag this up to the medical secretary or scheduling clerk who can alert the surgeon to rearrange the list.

• Operating lists may over-run due to unforeseen circumstances; dealing with this should not involve the use of the emergency team.

• All-day lists using the same theatre team, including surgeon and anesthetist can be particularly efficient and should be encouraged. There should be provision for meal and comfort breaks, however, and overall operating time should not be in excess of the number of planned sessions.

• Scheduled evening lists have been implemented in some trusts with mixed success.

• Day surgery lists increase overall efficiency and usually have a high utilization time. Effective utilization is increased by the provision of purpose-built self-contained and autonomous premises.

• It is both unreasonable and unfair to rely on the anesthetist to instigate curtailment of overrunning lists by cancellation of scheduled cases. A culture of good time keeping within the operating theatre encouraged and enforced by the theatre manager, will facilitate such decisions.

4:Management of human resources:

Many hospitals are currently experiencing severe shortages of suitably-trained staff due to high
workload, low pay and poor morale.
Hospital management must be made aware of these problems and be asked to facilitate local pay or benefit agreements.
• Being made to feel a valuable part of the team, working in a well managed, efficient theatre will improve morale and increase staff retention.
• Adequate orientation time should be made available for all staff.
• Adequate staffing must be provided to cover the tasks of data entry.

Annexure

Annexure 1:

instrument list

CHEST TRAY SET - 1

SR. NO.	NAME OF INSTRUMENT	QTY	OT START	OT END
1	STAINLESS STEEL TRAY WITH TRAY COVER			
2	SPONGE HOLDER			
3	BOWL			
4	TOWEL CLIP SHARP			
5	TOWEL CLIP BLUNT			
6	KNIFE HANDLE NO.4			
7	KNIFE HANDLE NO.7			
8	HAEMOSTATIC FORCEPS 6"			
9	ROBERT HAEMOSTATIC FORCEPS NEW			
10	ROBERT HAEMOSTATIC FORCEPS			
11	MOSQUITO FORCEPS			
12	STRAIGHT MOSQUITO FORCEPS			
13	ALLIS FORCEPS 8"			
14	ALLIS FORCEPS 6"			
15	BABCOCK 6"			
16	BABCOCK 8"			
17	MAYO SCISSORS CURVED			
18	MAYO SCISSORS STRAIGHT			
19	GOLDEN FINE SCISSORS			
20	NEEDLE HOLDER 10"			
21	NEEDLE HOLDER 8"			
22	NEEDLE HOLDER 6"			
23	HEAVY DEBACKY FORCEPS			
24	FINE DEBACKY FORCEPS			
25	CARDIOTOMY SUCKER			
26	METAL SUCKER			
27	SNUGGER ROD			
28	LINE ORGANIZER			
29	MIXTARD FORCEPS 8"			
30	WIRE CUTTER			
31	TWISTER			
32	KOCHERS			

33	LANGAN BACK MEDIUM			
34	LANGAN BACK SMALL			
35	ZERNY RETRACTOR			
36	CHEST SPREADER WITH 4 BLADE			
37	MAMARY RETRACTOR WITH 2 BLADE			
38	TUBING CLAMP			
39	CLIP APPLICATOR SMALL			
40	CLIP APPLICATOR MEDIUM			

A.V. FISTULA

SR. NO.	NAME OF INSTRUMENT		OT START	OT END
1	S.S TRAY WITH TRAY COVER			
2	BOWL			
3	SWAB HOLDER			
4	TOWEL CLIP SHARP			
5	BLUNT			
6	HAEMOSTATIC FORCEPS CURVED			
7	ALLIS FORCEPS 6"			
8	MOSQUITO FORCEPS CURVED			
9	MOSQUITO FORCEPS STRAIGHT			
10	KNIFE HANDLE NO.3			
11	KNIFE HANDLE NO.4			
12	MIXTARD FORCEPS 6"			
13	FINE SCISSORS			
14	MAYO SCISSORS			
15	TOOTH FORCEPS			
16	FINE DEBAKEY			
17	FINE SUCTION SUCTION CANNULA			
18	MASTOID SINGLE HOOK			
19	MASTOID THREE BLADE RETRACTOR			
20	NEEDLE HOLDER MEDIUM			
21	NEEDLE HOLDER SMALL			

TRACHEOSTOMY

SR. NO.	NAME OF INSTRUMENT	QTY	OT START	OT END
1	S.S TRAY WITH TRAY COVER			
2	BOWL			
3	SWAB HOLDER			
4	TOWEL CLIP BLUNT			
5	TOWEL CLIP SHARP			
6	KNIFE HANDLE NO.3			
7	KNIFE HANDLE NO.4			
8	KNIFE HANDLE NO.7			
9	HAEMOSTATIC FORCEPS CURVED			
10	MOSQUITO FORCEPS CURVED			
11	MOSQUITO FORCEPS STRAIGHT			
12	STRAIGHT FORCEPS 6"			
13	ALLICE FORCEPS 6"			
14	BABCOCK			
15	MIXTARD 8"			
16	NEEDLE HOLDER MEDIUM			
17	NEEDLE HOLDER SMALL			
18	FINE SCISSOR			
19	MAYO SCISSOR			
20	MASTOID SINGLE HOOK RETRACTOR			
21	TRACHEAL DILATOR			
22	SINGLE HOOK			
23	DOUBLE HOOK			
24	TOOTH FORCEPS			
25	PLAIN FORCEPS			
26	FINE DEBEKEY 6"			
27	SMALL LANGENBAG			

TETROLOGY OF FALLOT TRAY

SR. NO.	NAME OF INSTRUMENT		OT START	OT END
1	S.S TRAY WITH TRAY COVER			
2	MOSQUITO FORCEPS CURVED			
3	MOSQUITO FORCEPS STRAIGHT			
4	MOSQUITO FORCEPS STRAIGHT PAEDIATRIC			
5	COOLIE CLAMP PAEDIATRIC			
6	COOLIE CLAMP ROUTINE			
7	CROSS CLAMP PAEDIATRIC			
8	STRAIGHT CLAMP PAEDIATRIC			
9	DEFIB PADDLE PAEDIATRIC			
10	CARDIOTOMY PAEDIATRIC			
11	CUCKER PAEDIATRIC			
12	FINE DEBACKY 6"			
13	FINE DEBACKY 8"			
14	SCISSOR CURVED 8"			
15	SCISSOR CURVED 10"			
16	CHEST SPREADER PAEDIATRIC			
17	MIXTARD 6"			
18	MIXTARD 10"			
19	TUBING CLAMP			
20	GOLDEN NEEDLE HOLDER PAEDIATRIC			
21	V . S. D RETRACTOR			
22	SMALL LANGANBACK			
23	SINGLE HOOK RETRACTOR			
24	DOUBLE HOOK RETRACTOR			
25	BLUNT HOOK			
26	KILNER RETRACTOR PAEDIATRIC			
27	V . S. D WITH LANGENBAG			
28	THORACIC RETRACTOR PAEDIATRIC			

I. C. D TRAY

SR. NO.	NAME OF INSTRUMENT		OT START	OT END
1	S. S TRAY WITH TRAY COVER			
2	BOWL			
3	TOWEL CLIP BLUNT			
4	SPONGE HOLDER			
5	KNIFE HANDLE NO.7			
6	HAEMOSTATIC FORCEPS 6"			
7	HAEMOSTATIC FORCEPS BIG 8"			
8	MOSQUITO FORCEPS CURVED			
9	MOSQUITO FORCEPS STRAIGHT			
10	TOOTH FORCEPS			
11	PLAIN FORCEPS			
12	NEEDLE HOLDER MEDIUM			
13	MAYO SCISSORS			
14	FINE SCISSORS			

RE – WIRING TRAY

SR. NO.	NAME OF INSTRUMENT		OT START	OT END
1	S. S TRAY WITH TRAY COVER			
2	BOWL			
3	SPONGE HOLDER			
4	KNIFE HANDLE NO.3			
5	KNIFE HANDLE NO.4			
6	MOSQUITO FORCEPS CURVED			
7	MOSQUITO FORCEPS STRAIGHT			
8	HAEMOSTATIC FORCEPS CURVED 6"			
9	HAEMOSTATIC FORCEPS STRAIGHT 6"			
10	ALLICE FORCEPS 6"			
11	ALLICE FORCEPS 8"			
12	BABCOCK 6"			
13	WIRE HOLDER			
14	WIRE CUTTER SMALL			

15	KOCHERS CURVED			
16	TOOTH FORCEPS			
17	PLAIN FORCEPS			
18	SCOOP			
19	NEEDLE HOLDER MEDIUM			
20	NEEDLE HOLDER SMALL			
21	MAYO SCISSOR			
22	FINE SCISSOR			

VALVE SET

SR. NO.	NAME OF INSTRUMENT		OT START	OT END
1	S. S TRAY WITH TRAY COVER			
2	MOSQUITO FORCEPS STRAIGHT			
3	MITRAL VALVE RETRACTOR			
4	AORTIC RETRACTOR			
5	C . P CANNULA RIGHT			
6	C. P CANNULA LEFT			
7	RONZER STRAIGHT			
8	RONZER CURVED			
9	VALVE CUTTING SCISSOR			
10	GOLDEN CUTTING SCISSOR			
11	FINE SCISSOR CURVED			
12	NEEDKE HOLDER 6"			
13	NEEDLE HOLDER 10"			
14	NEEDLE HOLDER 12"			
15	VALSALAM			
16	BLUNT HOOK			
17	GLASS			
18	LANGANBAG			

DRAPING PACKET TOTAL – 7

1	METER SINGLE SHEET (BLUE)			
2	1 - ½ METER			
3	1 – 1/3 METER DOUBLE SHEET			
4	1 - ½ METER (WITH RUBBER)			
5	3 METER SINGLE SHEET			
6	TRIANGULAR			
7	CAUTRY BAG			
8	PACKING 1 - ½ METER DOUBLE SHEET (BLUE)			
9	GOWN PACKET			
10	HAND TOWEL			
11	MEYO TROLLY COVER			
12	TROLLY COVER			
13	1 - ½ METER DOUBLE SHEET WITH RUBBER SHEET			
14	JUMBO TROLLY COVER			
15	1 - ½ METER DOUBLE SHEET (BLUE)			
16	3METER SINGLE SHEET			
17	RADIAL DRAPING			
18	RADIAL DRAPING			
19	1- ½ METER DOUBLE SHEET WITH RUBBER SHEET			
20	1 METER SINGLE SHEET			
21	TRIANGULAR			
22	FOR PACKING SHEET			
23	RADIAL-5			
24	GOWN – 10			
25	MEYO -3			
26	JUMBO -4			
27	1METER (DOUBLE) SHEET BLUE			
28	1METER KHAKHI SHEET (DOUBLE)			

VALVE SET – 2

SR. NO.	NAME OF INSTRUMENT		OT START	OT END
1	S. S TRAY WITH TRAY COVER			
2	MOSQUITO FORCEPS STRAIGHT			
3	MITRAL VALVE RETRACTOR			
4	AORTIC RETRACTOR			
5	C . P CANNULA RIGHT			
6	C. P CANNULA LEFT			
7	RONZER STRAIGHT			
8	RONZER CURVED			
9	VALVE CUTTING SCISSOR			
10	GOLDEN CUTTING SCISSOR			
11	FINE SCISSOR CURVED			
12	NEEDKE HOLDER 6"			
13	NEEDLE HOLDER 10"			
14	NEEDLE HOLDER 12"			
15	VALSALAM			
16	BLUNT HOOK			
17	GLASS			
18	LANGANBAG			

Coronary tray

SR. NO.	NAME OF INSTRUMENT	QTY	OT START	OT END
1	S.S TRAY WITH TRAY COVER			
2	RINGLET FORCEPS			
3	ZIRALD FORCEPS			
4	PARTIAL CLAMP			
5	COOLEY CLAMP			
6	CROSS CLAMP			
7	CORONARY PROBE			
8	CORONARY HOOK			
9	SUPERCUT SCISSORS			
10	CASTRO VIGGO 8"			
11	CASTRO VIGGO 10"			
12	NEEDLE HOLDER			
13	SUCTION CANNULA FINE			

Leg set

SR. NO.	NAME OF INSTRUMENT	QTY	OT START	OT END
1	S.S TRAY WITH TRAY COVER			
2	KNIFE HANDLE NO.3			
3	KNIFE HANDLE NO.4			
4	HAEMOSTATIC FORCEPS 6"			
5	MOSQUITO FORCEPS CURVED			
6	ALLIS FORCEPS 6"			
7	TOOTH FORCEPS 6"			
8	TOOTH FORCEPS PLAIN			
9	MAYO SCISSORS			
10	FINE SCISSORS			
11	BLACK FINE SCISSORS			
12	FINE DEBACKY FORCEPS			
13	MIXTARD FORCEPS			
14	NEEDLE HOLDER 6"			
15	NEEDLE HOLDER 8"			
16	NEEDLE HOLDER 10"			
17	MASTOID RETRACTOR WITH 3 BLADE			
18	MASTOID RETRACTOR WITH SINGLE BLADE			
19	BOWL			

Orthopedic drum

SR. NO.	INSTRUMENT	QTY	OT START	OT END
	BOX – 1			
1	PLATE BLENDER			
2	DRILL BIT NO.6.5			
3	DRILL BIT NO. 4.5			
4	SCREW DRIXER 2.5			
5	SMALL PLAYER			
6	BONE PUNCH			
7	DRILL BIT NO. 4.0			
8	"T" HANDLE SMALL			
9	WIRE PASSER			

10	DRILL GUIDE			
11	BONE HOOK			
12	WIRE TWISTER			
13	SMALL SPIKE			
14	DEPH GAUGE			
15	TAP NO. 4.5			
16	TAP NO.2			
17	TAP NO.3.5			
18	DRILL BIT NO.3.6			
19	DRILL BIT 1.2			
20	DRILL BIT 3.5			
21	DRILL BIT 4.5			
22	DRILL BIT 3.2			
23	DRILL BIT 2.7			
24	DRILL BIT 2.5			
	BOX – 2			
1	HANCE BONE			
2	HOLDING CLAMP			
3	PAROD BIT MEDIUM CLAMP			
4	SMALL PAROD BIT			
5	POINTED CLAMP			
	BOX -3			
1	PAROD BIT BIG CLAMP			
2	POINTED CLAMP			
	DRUM			
1	HAND SCREW			
2	HAND DRILL WITH KEY			
3	PLAYER			
4	SCREW DRIVER			
5	WIRE PASSER			
6	PLATE BLENDER			
7	HAMMER			
8	DEPTH GUAGE			
9	NIBBLER SMALL			
10	NIBBLER BIG			
11	REMOVER HANDLE			
12	CATSPAW			

13	BONE CUTTER			
14	GUIDE WIRE			
15	SELF RETAINING RETRACTOR			
16	SCALE			
17	SPANNER 4 / 6			
18	SPANNER 6 / 8			
19	SPANNER 6 / 9			
20	SPANNER 11 / 11			
21	SPANNER 10 /10			
22	PLAYER NEW			

cholecystotomy set

SR. NO.	INSTRUMENT	QTY	OT START	OT END
1	KIDNEY TRAY			
2	BOWL			
3	KNIFE HANDLE			
5	TOWEL CLIP			
6	NON TOOTH FORCEPS			
7	TOOTH FORCEPS			
8	TISSUE CUTTING SCISSOR			
9	TOUGH SCISSOR			
10	SPONGE HOLDER			
11	HAEMOSTATIC FORCEPS			
12	ALLICE FORCEPS			
13	BABCOCK			
14	NEEDLE HOLDER			
15	"L" SHAPE RETRACTOR			
16	LENGANBAG RETRACTOR			
17	SUCTION CANNULA			
18	STONE HOLDING FORCEPS			
19	SCOOP			
20	ADSON'S FORCEPS			

Laprotomy set

SR. NO.	INSTRUMENT	QTY
1	BOWL	
2	SPONGE HOLDER	
3	KIDNEY TRAY	
4	SUCTION CANNULA SIMPLE	
5	SUCTION CANNULA MULTIPLE	
6	LANGAN BACK RETRACTOR	
7	MIXTARD 10" / 7"	
8	TOOTH FORCEPS 10"	
9	TOOTHLESS FORCEPS 10"	
10	COCHERS CLAMP CURVED	
11	COCHERS CLAMP STRAIGHT	
12	ALLICE FORCEPS 8"	
13	ALLICE FORCEPS 6"	
14	BABCOCK 8"	
15	BABCOCK 6"	
16	ARTERY FORCEPS 10" CURVED	
17	ARTERY FORCEPS 10" STRAIGHT	
18	ARTERY FORCEPS 8" CURVED	
19	ARTERYFORCEPS 6" CURVED	
20	ARTERY FORCEPS 6" ST	
21	MOSQUITO FORCEPS CURVED 5"	
22	MOSQUITO FORCEPS STRAIGHT 5"	
23	INTESTINAL CLAMP 8" ST	
24	INTESTINAL CLAMP 8" CURVED	
25	TOWEL CLIPS	
26	FINE SCISSORS 7"	
27	FINE SCISSORS 10"	
28	SUTURE CUTTING SCISSOR 7"	
29	ADSON'S FORCEPS TOOTH 5"	
30	ADSON'S FORCEPS PLAIN 5"	
31	ADSON'S FORCEPS TOOTH 7"	
32	ADSON'S FORCEPS PLAIN 7"	
33	B. P HANDLE 3	
34	B. P HANDLE 4	
35	B. P HANDLE 7	
36	HERNIA RING	

Retractor tray

	RETRACTOR TRAY	
SR. NO.	INSTRUMENT	QTY
1	BLADDER RETRACTOR	
2	"C" RETRACTOR	
3	LANGEN BACK RETRACTOR	
4	DEVERSE RETRACTOR	
5	SELF RETAINING	
6	SARGEN RETRACTOR	
7	COPPER PATTY RETRACTOR	
8	MOUSE RETRACTOR	
9	DOWINSE RETRACTOR	
10	GERMI RETRACTOR	

Gynaec tray

SR. NO.	INSTRUMENT	QTY	OT START	OT END
1	BOWL			
2	KNIFE HANDLE			
3	SPONGE HOLDER			
4	FUNNIES CLAMP			
5	COCKERS CLAMP			
6	BIOPSY FORCEPS PUNCH			
7	UTERINE SOUND			
8	SIMS SPECULAM			
9	VAGINAL RETRACTOR			
10	VALSELUM			
11	HAEMOSTATIC FORCEPS			

Paediatric set:

SR.NO.	INSTRUMENT	QTY	OT START	OT END
1	KIDNEY TRAY			
2	BOWL			
3	KNIFE HANDLE			
4	TOWEL CLIP			
5	TOOTH FORCEPS			
6	TISSUE CUTTING SCISSOR			
7	TOUGH SCISSOR			
8	SPONGE HOLDER			
9	HAEMOSTATIC FORCEPS			
10	ALLICE FORCEPS			
11	BABCOCK			
12	NEEDLE HOLDER			
13	L' SHAPE RETRACTOR			
14	CATSPO RETRACTOR			
15	DIVERSE RETRACTOR			
16	SELF RETAINING RETRACTOR			
17	MASTOID RETRACTOR			
18	SUCTION CANNULA			
19	ADSON'S FORCEPS			

References:

1) **The Association of Anesthetists of Great Britain and Ireland. Website: www.aagbi.org.**
2) sonal.shukla@expressindia.com
3) Are Your Hospital Operating Rooms "Efficient"? Anesthesiology 2006; .
4) ^ Abouleish A, et al. Labor Costs Incurred by Anesthesiology Groups Because of Operating Rooms Not Being Allocated and Cases Not Being Scheduled Maximize Operating Room Efficiency. Anesth Analg 2003; 96: 1109-13.
5) "http://en.wikipedia.org/wiki/Operating_room_management"
6) *Surgical Services Reform: Executive Briefing for Clinical Leaders,* Washington, D.C.: Clinical Advisory Board, 2001, pp 20-21.
7) McKesson Corporation, San Francisco, Calif., 2002.
8) *The Operating Room Directors Study,* Princeton, N.J.: The Gallup Organization, 2001