Assessment of Financial Viability of Packages Offered for Key Select Surgical Procedures in a Quaternary Care Multispeciality Hospital

By

Shreyasi Dey

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MBA Hospital and Health Management

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The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer Airport
Jaipur-302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: www.iihmr.edu.in

Internship Training

At

Global Hospital, Lakdikapul, Hyderabad

An assessment of financial viability of packages offered for key select surgical procedures in a quaternary care multispeciality hospital

By

Dr. Shreyasi Dey

Under the guidance of

Ms. Geetika Goswami

MBA Hospital and Health Management

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The IIHMR University, Jaipur

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

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The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.
The Internship is in fulfillment of the course requirements.
I wish her all success in all her future endeavors.

Col. (Dr.) ASHOK KAUSHIK
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MS. GEETIKA GOSWAMI
Assistant Professor
The IIHMR University, Jaipur

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22nd February 2016- 12th May 2016

Global Hospital, Lakdikapul, Hyderabad

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavors

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PROJECT GUIDE
Dr. Ananth Pai
General Manager, Medical Services
Global Hospital, Lakdikapul, Hyderabad

Ms. Garima Gupta
Head, Human Resources
Global Hospital, Lakdikapul, Hyderabad

A unit of Ravindranath GE Medical Associates Pvt. Ltd.
Global Hospitals, 6-1-1070/ 1to4, Lakdi-ka-pool, Hyderabad - 500 004
Ph.: +91 40 2324 4444 (10 lines), Fax : +91 40 2324 4455
Aware Global Hospitals, 08-16-01, Sagar Road, Saroornagar (L.B. Nagar), Hyderabad - 500 035 Ph.: +91 40 2411 1111 Telefax : +91 40 2403 2366
info@globalhospitalsindia.com www.globalhospitalindia.com
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Shreyasi Dey

Signature

ABSTRACT

Title: **An assessment of financial viability of packages offered for key select surgical procedures in a quaternary care multispeciality hospital.**

Author: Dr. Shreyasi Dey

Background: Corporate hospitals have designed various packages for medical treatments requiring hospitals to cater to patient convenience as well as faster recovery of costs involved. A package is a set of services offered by a healthcare provider that clearly mentions the included services, costs and exclusions if any related to a specific medical. In the context of pre negotiated tariffs for surgical packages availed by cash or credit patients, there lies a gap between the actual cost incurred and recovery.Lacunae in expected and actual revenue generation when health insurance schemes are involved, a differential cost analysis of key procedures performed is imperative to study the financial viability of hospitalization packages offered to credit patients for sustenance of the hospital.

Objectives:

1. To estimate the differential costs of key surgical procedures of a quaternary care multi-specialty hospital.
2. To assess the financial viability of hospitalization packages offered to cash and credit patients.
3. To assess the effect of cost of cushioning of vacant beds on overall viability of the package.

Keywords: Cost, financial viability, surgery, packages, tariff, margins, cushioning.

Methodology:

Study area: Single site- 150 bedded quaternary care multispeciality hospital, Hyderabad.

Out of 150, 14 beds belong to dialysis, emergency and radial lounge. Thus, 136 beds comprise of inpatient beds, which include ICU, wards, sharing, single, deluxe and super deluxe rooms.

Study design: Retrospective study, with microcosting approach.

Sample selection- All bills for the period of past three months of each procedure was taken for cost analysis.

Purposive sampling for Laparoscopic cholecystectomy of 10 bills each (cash and credit patients) in the past three months was observed.

Exclusions: Patients with multiple surgeries or co morbidities.

Methods of data collection: Data was collected from the Hospital Information System, KraniumHealth and comparative analysis was done with the help of Microsoft Excel.

Key procedures:

1. Laparoscopic Cholecystectomy
2. Laparoscopic repair of Inguinal Hernia
3. Ureteroscopic Lithotripsy
4. Transurethral Resection of Prostrate
5. Extracorporeal shock wave lithotripsy
6. Total Knee Replacement
7. Laminectomy

Results

Viable surgical procedures:

1. Laparoscopic cholecystectomy(cash packages)
2. Laparoscopic cholecystectomy (credit)
3. Laparoscopic repair of inguinal hernia
4. Ureteroscopic lithotripsy
5. Transurethral resection of prostrate
6. Laminectomy

Non viable surgical procedures: As the costs of vacant beds needs to be absorbed by the occupied beds for the smooth functionin of the healthcare organization, these costs are also included to check for financial viability of surgical procedures offered as packages.

1. Extracorporeal shock wave lithotripsy

2. Total Knee Replacement-
    - Not viable for GIPSA rates in General ward
    - Not viable for general ward package for cash/self pay patients
    - Break-even for sharing rooms under GIPSA rates.

Conclusion:

Although, the analysis depicts financial viability of most of the procedures, the profits earned range from 37- 63%.Cost of vacant bed represents 41% of total cost after cushioning. Adding cost of unoccupied beds causes the profit margins to drop 22-42 percentage points. Manpower takes up the highest fraction,58-80%, in the components of entire costing of each procedure.

ACKNOWLEDGEMENT

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I am using this opportunity to express my deepest gratitude and special thanks to my guide **Dr. Ananth Mohan Pai, General Manager, Medical Services, Global Hospital,** who in spite of being extraordinarily busy with his duties, took time out to hear, guide and keep me on the correct path and allowing me to carry out my dissertation at their esteemed organization during the training.

I express my deepest thanks to **Dr Ashwini Amareshwar, Assistant General Manager,** for taking part in useful decision & giving necessary advice and arrange all facilities to make life easier. I choose this moment to acknowledge his contribution gratefully.

My sincere gratitude to my guide **Dr. Geetika Goswami**, **Assistant Professor, The IIHMR University,** for her constant encouragement.

I would also like to thank all who have directly or indirectly supported me towards the completion of the dissertation.

Sincerely,

Dr. Shreyasi Dey

MBA-HM (2014-2016)

TABLE OF CONTENTS

1. INTRODUCTION

Global Hospitals Group, India's most renowned healthcare services provider offering better care, cutting-edge research and advanced education to caregivers, is one of the country's fast growing chains of Multi Super Specialty Tertiary Care Hospitals offering healthcare services of international standards. A 2000-bed Multi Super Specialty Tertiary Care facility spread across Hyderabad, Chennai, Bangalore and Mumbai, Global Hospitals is a pioneer in Multi-Organ Transplants including kidneys, liver, heart and lung.

The Group offers most advanced clinical services across several disciplines such as Gastroenterology, Hepatobiliary & Liver, Cardiac Sciences, Neurosciences, Orthopaedics & Joint Replacements, Organ Specific Cancer Care, Urology & Nephrology, Plastic & Reconstructive Surgery, Minimal Access & Bariatric Surgery, Critical Care & Pulmonology, Trauma & Emergency Care, ENT, Transfusion Medicine and other support specialties accessible to all the segments of the society with utmost care and compassion.

With a vision to be a world-class healthcare provider turning distant possibilities into realities, Global Hospitals utilizes a strong combination of clinical expertise, advanced technology, world-class infrastructure and facilities to deliver high quality medical services of international standards. Having collaborations with several leading Indian and internationally reputed academic institutions, the Group offers a wide array of academic programmes for both medical and non-medical professionals. Recognized by the government bodies for research, the Group has made significant strides in advanced medical research programmes including Stem Cell and Regenerative Medicine Programmes.

Corporate hospitals have designed various packages for medical treatments requiring hospitals to cater to patient convenience as well as faster recovery of costs involved. A package is a set of services offered by a healthcare provider that clearly mentions the included services, costs and exclusions if any related to a specific medical treatment. These hospitalization packages are customized based on requirements of patients' need

and the respective hospitals financial considerations. Advantages of the package system include psychological preparedness of the consumer as he/she is aware about the charges; settlement of payments and improved monetary efficiency in the hospital's perspective.

Increasing trend of credit patients in the hospitals is seen with health insurance schemes coming into the picture. While, life saving procedures are covered by insurance companies by evaluating "medically necessary" interventions, the case is not so when elective surgeries are concerned. Also, treating intra operative findings puts the surgeon in a dilemma to include or exclude a non-package procedure as reimbursements by insurance companies is based on compensations agreed between the parties prior to surgeries and are inflexible patient needs.

Such kind of ambiguity, puts the healthcare provider in a difficult situation with respect to patient satisfaction, quality of care and payment of bills.

Differential Cost Analysis takes into account only those costs that are relevant to managerial decision making and may differ between alternatives. Irrelevant costs are those that cannot be altered and are unavoidable. An avoidable or relevant cost is a cost that can be eliminated, in whole or in part, by choosing one alternate over the other. When compared to total cost analysis, differential cost analysis is less time consuming and focussed.

Following differential costing, price of hospitalization packages is determined after adding the contribution based on hospital's pricing policy.

2. PROBLEM DEFINITION

In the context of pre negotiated tariffs for surgical packages availed by cash or credit patients, there lies a gap between the actual cost incurred and recovery.

3. RATIONALE

The healthcare services rendered involve huge costs and minimal profit margins. A differential cost analysis of key procedures performed is imperative to study the financial viability of hospitalization packages offered to cash and credit patients for sustenance of the hospital.

4. OBJECTIVES

4.1 To estimate the differential costs of key surgical procedures of a quaternary care multi-specialty hospital.

4.2 To assess the financial viability of hospitalization packages offered to cash and credit patients.

4.3 To assess the effect of cost of cushioning of vacant beds on overall viability of the package.

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5. LITERATURE REVIEW

'Packages' are in fashion today for most surgical procedures in various corporate hospitals and this has included laparoscopic procedures too. A package system enables the hospitals to get cost settlements done more easily. Also, it is more convenient for the patients who are aware upfront of the charges. The principal disadvantages seems to be for the surgeon, who may face displeasure of the patient, hospital or insurance agencies apart from forfeiting his personal charges if (a) he is a novice in laparoscopic surgery and takes extra time to complete a procedure, (b) unforeseen problems occur during surgery, or (c) new pathologies are discovered on exploration.

Whenever a patient is referred under the ′package′ system, the surgeon is in a difficult position. For example, if the duration of surgery increases due to unexpected operative findings such as acute cholecystitis with adhesions in the Calot′s triangle. A complex situation arises when the patient who is referred undergoes multiple surgeries. For example, when the authority refers a patient for laparoscopic cholecystectomy, his gallbladder alone must be removed and in no way is the surgeon allowed to discover/tamper with his inflamed appendix. In essence, this is seen as a deterrent to a thorough diagnostic laparoscopy as it may bring forth a ′nonpackage′ pathology, which may require intervention. Even if the surgeon decides to treat the other pathology discovered, his own surgical fees are likely to be deducted by the hospital if the referring authority/insurance company refuses to sanction any excess charges for the extra procedure.[1]

The growth of health insurance in India and worldwide cannot be underestimated. The head, Health Insurance, Bajaj Allianz has expressed the same in his article. “A look at 2015 reveals that the key focus areas for the industry will be awareness, product innovation, accessibility, value-added services and preventive care, when it comes to catering to a policyholder’s requirements, with data analytics and technology being the key enablers. Consumers will see a range of health awareness campaigns emphasising on importance of health insurance. The industry will have to position this tool correctly to create a need for health insurance in the market and this will be instrumental for improving the penetration of health insurance within

the country. In 2015, we are also likely to see innovation in the space of health insurance products."[2]

Constant check on healthcare costs is required to maintain healthy growth of any organization. "In assessing financial viability, it is also important to consider both short-term and longer-term viability. Short-term viability has to do with ability to meet short-term commitments as they fall due, while longer-term financial viability concerns the ability to meet future financial obligations as they fall due."[3]

The total cost incurred by Jai Prakash Narayan Apex Trauma Trauma Centre, AIIMS in providing in-patient care to patients admitted in the ward came out to be Rs. 3,650.46/bed/day. The mean preoperative stay in the wards was 12 days which lead to a loss of around Rs. 2,975,125.00 to the Institutes' Accounts. The average expenditure in the waiting period was Rs. 43,117.00/patient approximately US$ 9,000. The mean postoperative stay was 2 days and incurred a cost of around Rs. 6,449.00/patient. The cumulative cost incurred on AIIMS in providing the in-patient care in 2010 was a whopping Rs. 3,588,402. The labor cost was calculated as per standard Cost and Accountancy Guidelines; wherein it (labor cost) was calculated by apportioning the salary of the entire staff spectrum involved in-patient care, to the extent of their time commitment, as evidenced by the study "Design of a Costing System, AIIMS, Tata Consultancy Services, 1987;" in the same study setting. [5]

Elements of cost

The various elements which make up the total cost of any product may be divided into three main headings:Material, Labor, Expenses.

Material

The materials which form the total cost included all consumables and disposables. A list of all the medicines, intravenous fluids, nutritional supplements and diet was prepared for each patient.

Labor

Labor cost was calculated from the salary and allowances drawn by the staff involved directly or indirectly in the care of patients. Consultants, residents, nurses, technicians and Group D employees are the main groups in this category.

Data regarding the salaries was taken from the accounts section (trauma center) and was apportioned as per the study done by the Tata Consultancy Services, 1987.

Expenses

These are the expenses which can be directly or indirectly allocated to specific cost centers or cost units. Examples of such expenses are: Electricity, water and air condition expenses.

Based on the results of the total cost to the hospital during the period of the study; the cost to hospital per bed per day was calculated as below:

Cost to hospital per bed per day = Total per day cost for the whole hospital/total number of beds in the hospital.

In compliance with the Cost and Accountancy guidelines and standard practice, all across the globe; total cost just can't be arrived at without calculating the indirect cost, of which the building, furniture, equipment are invariable and significant cost elements. Having not factored them in would have rendered the calculation of total cost/bed/day invalid and infructuous. Further, an astute manager/administrator will always like to know the opportunity cost and/or sunk cost, in order to rationalize them; for which Indirect cost estimation is equally important.

These indirect costs, which are borne by the hospital include.

Support and utility services

Laundry services

Central sterile supply department

Blood bank

Dietary services

Medical record section

Radiology and laboratory services

Hygiene and sanitation services.

Administrative support services

Building cost

Cost of furniture and equipment: A discounting value of 10% p.a. can be charged to this account assuming the life of such article as 10 years

Maintenance of building.

A list of equipments and furniture used in the ward was obtained from the sister in charge of the ward. The cost per item was obtained from the central stores department and the total cost per bed was calculated as;

Total cost per day = (cost of equipment/10)/365.

Total cost per day per bed = total cost per day/total number of beds in the ward.

Similarly building cost and maintenance cost were obtained from the Central Public Works Department CPWD and the cost was calculated taking into account the presumed life of the building. The acquisition cost was not taken into account. Total cost per bed was then calculated taking into account the above data.[6]

Modeling techniques vary greatly depending on available resources, the complexity of the organization, and the characteristics of the proposed changes. The following are some key tips to keep in mind: ■ Factor in all three components—cost, market data, and payment—

when making pricing decisions. Make sure that you are pricing your supplies within a reasonable range of your market. ■ Understand your contracts with your managed care payers and how the effect of price changes on those contracts will impact the bottom line. ■ Identify your direct costs per procedure in order to know your negotiating points with your managed care contractors. ■ Identify market data on a procedural basis, particularly for those procedures that generate 80 percent of revenues. ■ Know the relationship of your pricing to your cost to ensure that an item's markup is not out of line, making defense of the price a challenge. ■ Perform a market analysis, ideally on an annual basis. Don't let more than two years go by without looking at comparative data. Even though price modeling is generally done annually, costs for some high-cost medical devices and pharmaceuticals may change much more frequently. So make certain that prices take these frequent (and possibly big) changes into account. Ensure that internal controls can be documented and that compliance issues are covered. Also, consider technology solutions to the price-modeling scenario. Try to find suppliers that have experience with price modeling in a variety of provider situations and have access to comparative pricing benchmarks.[7]

6. METHODOLOGY

6.1 Study area: Single site- 150 bedded quaternary care multispeciality hospital, Hyderabad.Out of 150, 14 beds belong to dialysis, emergency and radial lounge. Thus, 136 beds comprise of inpatient beds, which include ICU, wards, sharing, single, deluxe and super deluxe rooms.

6.2 Study design: Retrospective study, with microcosting approach.

6.3 Sample selection- All bills for the period of past three months of each procedure was taken for cost analysis.

Purposive sampling for Laparoscopic cholecystectomy of 10 bills each (cash and credit patients) in the past three months was observed.

Exclusions: Patients with multiple surgeries or co morbidities.

Also preoperative and follow up costs have been excluded from the study.

6.4 Sample size: 78

Surgery	Sample size
Laparoscopic Cholecystectomy Cash	10
Laparoscopic Cholecystectomy Credit	10
Laparoscopic repair of Inguinal hernia	13
Extracorporeal Shock wave Lithotripsy	10
Transuretral resection of prostrate	10
Ureteroscopic lithotripsy	12
Total Knee Replacement	7
Laminectomy	6
	78

6.5 Methods of data collection:

Data was collected retrospectively of months January to March 2016 from the Hospital Information System, KraniumHealth. Comparative analysis was done with the help of Microsoft Excel.

The costs of overheads like water and electricity, also outsourced departments of security, food and beverages, housekeeping, and building cost were derived from bills of months included in the study period.

6.6 Key procedures:

i. Laparoscopic Cholecystectomy

ii. Laparoscopic repair of Inguinal Hernia

iii. Ureteroscopic Lithotripsy

iv. Transurethral Resection of Prostrate

v. Extracorporeal shock wave lithotripsy

vi. Total Knee Replacement

vii. Laminectomy

The most frequently done surgeries from the key departments were selected for cost analysis.

6.7 Methods:

Cost of material, manpower, equipment and overheads was calculated on the basis of information available in the bills.

Material- Material cost was calculated as the sum of unit cost price of drugs and consumables used during the entire stay of the patient. The average of all bills observed was considered.

Manpower-. Personnel involved were surgeons,anaesthetists, residents, nurses, operation theatre technicians and pharmacists. Cost per hour was arrived at by dividing total salaries by number of employees, multiplied by number of hours spent on the patient, followed dividing this value by the personnel to patient ratio.

Surgeon costs were derived by taking into account professional fee payable. The cost per day per patient was calculated and multiplied by the duration of patient's stay in the hospital.

Equipment- Cost of equipment per procedure was calculated. Price of major equipment used in each surgical procedure studied here was divided by 8 years(taken as life of equipment) to get the per year cost, and further divided by 300(working days of operation theatre), then by 10(working hours per day) and multiplied by average time taken to perform the surgery.

Overheads- Cost of overheads per bed per day was calculated. Bills of past three months of water, electricity, building cost (rent, property tax and fire policy) and outsourced departments i.e. housekeeping, food and beverage, security,was divided by square feet area occupied by inpatient area(wards,sharing rooms, single rooms,deluxe, deluxe sharing and super deluxe and operation theatre).

This calculated cost was compared to the tariffs offered by TPAs and checked for financial viability.

7. ANALYSIS

The average bed occupancy of the 150 bedded hospital was studied over 50 days.

The type of patients are classified as cash, corporate,TPA, Aarogyasree patients. The average bed occupancy was found to be 77, rounded off to 80 has been used for ease of calculations.

For 80 occupied beds, 56 beds are vacant or for every bed, 0.7 beds lie vacant. In the service industry, vacant beds contribute negatively to costs. Hence, cost of vacant beds has been added to the cost of each of the following surgeries in order to compare with the offered tariff to check for viability.

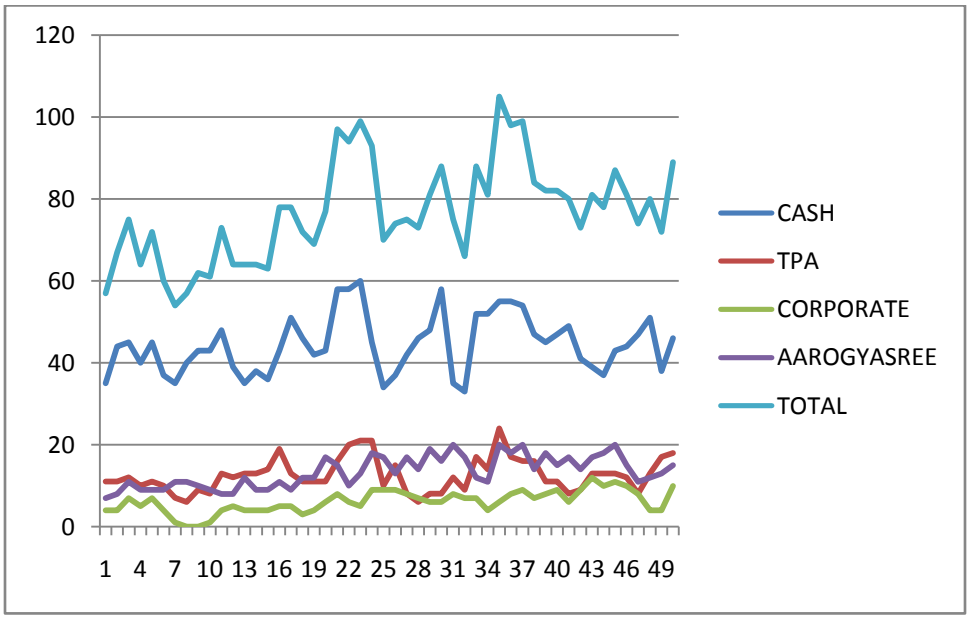


Figure 7.1- Bed occupancy

Cost of Laparoscopic Cholecystectomy(Cash Packages)

Costing of laparoscopic cholecystectomy was done using a micro costing approach. Unit costs of all the cost heads, i.e., materials, manpower, equipment and overheads was calculated.

Material costs, comprising of drugs and disposables was calculated by adding the unit cost price of each item, multiplied by consumed numbers. The average of all sum totals was then taken as material cost of one laparoscopic cholecystectomy.

Manpower consists of surgical and post operative care personnel.

Personnel involved were surgeons,anaesthetists, residents, nurses, operation theatre technicians , dieticians and pharmacists.

Surgeon costs were derived by taking into account professional fee payable. 20% of package value is the amount paid as fee to the surgeon. In the case of open bills, drugs and consumables are subtracted and 20% of the total bill is given as fees to the surgeon. For the purpose of costing, the average of all surgeon fees in the sample was taken into consideration.

Anaesthetist team comprising of 7 personnel were outsourced in the orgganization. The amount paid per month was divided by number of personnel, then divided by number of working days, divided by 24 to get per hour cost. This was multiplied by duration of the surgery to arrive at the unit cost of anaesthetist.

Similarly, cost per hour was arrived at by dividing total salaries by number of residents, nurses, pharmacists, technicians and dieticians, multiplied by number of hours spent on the patient, followed dividing this value by the personnel to patient ratio.

All the major equipments required for carrying out laparoscopic cholecystectomy was listed. The price of the equipment at installation was divided by life of the machine, taken here as eight years to obtain the per year cost of the equipment. Following this, per day cost was arrived at by dividing the per year cost by working days of operation theatre, that is, 300. The figure was then divided by number of working hours of operation theatre per day, that is, 10. This amount was then multiplied by number of hours it takes to carry out the surgery, which is around one and a half hours.

Depreciation was out of scope as most of the equipments were bought eight years before the conduct of this study.

Overheads include water and electricity. The monthly bills of three months were taken and averaged. This average was then divided by the area occupied by all inpatient beds in the hospital. The unit of measurement was square feet. The per day cost was then calculated by dividing this value by 30, followed by dividing the new value by 136 to obtain the per day per bed cost of water and electricity.

In a similar fashion, cost of outsourced departments, security, housekeeping, food and beverage was calculated to obtain per day per bed cost.

The costs of post operative manpower and overheads was multiplied by the average length of stay of the patient.

Now, as cushioning of empty bed was calculated by deducting drugs and consumables from the subtotal and multiplied by 0.7. This factor was chosen based on the trends of bed occupancy. For every occupied bed, 0.7 bed lies vacant and the fixed cost of the empty bed needs to be compensated.

As the revenue earned comprises of costs and margins, margins get lowered because of this need of cost absorption. Hence, the amount calculated as cost of vacant bed is added to grand total of unit cost of one laparoscopic cholecystectomy.

	Cost heads	Amount (in rupees)	Component of total cost
A	Material (Drugs & disposables)	3213.7	14%
B	Manpower	17616.3	75%
C	Equipment	1182.9	5%
D	Overheads	1542.5	7%
	Subtotal (A+B+C+D)	**23555.4**	100%
E	Cost of vacant bed (Indirect Cost)	14239.2	
	GRAND TOTAL (subtotal + E)	**37794.5**	

PACKAGE DAYS	GW	SHARING	DLX SHARING	SINGLE	DELUXE	SUP. DLX
2 TO 3	47500	60000	67000	80000	90000	97500

Finding: Viable

The differential costs of laparosclopic cholecystectomy for material was 14%, for manpower 75%, equipment only 5% and overheads 7%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 23,555.

Grand total after cushioning comes to Rs 37,795.

Package offered for general ward is Rs 47,500 for laparoscopic cholecystectomy.

Even after adding cost of vacant bed, some amount of profit margin was found. Therefore, laparoscopic cholecystectomy under packages offered to self pay patients is financially viable for the hospital.

Cost Of Laparoscopic Cholecystectomy (Credit)

	Cost heads	Amount	Component of total cost
A	Material (Drugs & disposables)	3163.4	14%
B	Manpower	16483.8	74%
C	Equipment	1182.9	5%
D	Overheads	1542.5	7%
	Subtotal (A+B+C+D)	**22372.7**	100%
E	Cost of vacant bed (Indirect Cost)	13446.4	
	GRAND TOTAL (subtotal + E)	**35819.1**	

	Package days	GW	SHARING	Deluxe SHARING	SINGLE	DELUXE	Super Deluxe
GIPSA	3	55250	59500	59500	63750	N.A.	N.A.
TPA	3	44500	52500	60000	70500	78500	89500

Finding: Viable

The differential costs of laparosclopic cholecystectomy for material was 14%, for manpower 74%, equipment only 5% and overheads 7%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 22,372.

Grand total after cushioning comes to Rs 35,819.

Package offered for general ward in GIPSA Tariffs for government insurance schemes is Rs 55,250 for laparoscopic cholecystectomy.

Package offered for general ward in TPA Tariffs for Private insurance schemes is Rs 44,550 for laparoscopic cholecystectomy.

Even after adding cost of vacant bed, some amount of profit margin was found. Therefore, laparoscopic cholecystectomy under packages offered to credit patients is financially viable for the hospital.

Cost of Laparoscopic repair of Inguinal hernia

	Cost heads	Amount (In Rupees)	Component of total cost
A	Material (Drugs & disposables)	3952.9	18%
B	Manpower	15848.0	72%
C	Equipment	1088.4	5%
D	Overheads	1140.5	5%
	Subtotal (A+B+C+D)	**22029.8**	100%
E	Cost of vacant bed (Indirect Cost)	12653.8	
	GRAND TOTAL (subtotal + E)	**34683.8**	

GIPSA PACKAGE	GW	SHARING	DLX SHARING	SINGLE
3 DAYS	51000	59500	59500	63750

Finding: Viable

The differential costs of laparosclopic repair of Inguinal hernia for material was 18%, for manpower 72%, equipment only 5% and overheads 5%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 22.030.

Grand total after cushioning comes to Rs 34,684.

GIPSA Package offered for general ward is Rs 51,000 for laparoscopic repair of Inguinal hernia.

Even after adding cost of vacant bed, some amount of profit margin was found. Therefore, laparoscopic repair of Inguinal hernia under packages offered to patients is financially viable for the hospital.

Cost of Ureteroscopic Lithotripsy

	Cost heads	Amount (in Rupees)	Component of total cost
A	Material (drugs & disposables)	883.9	6%
B	Manpower	11261.7	80%
C	Equipment	863.4	6%
D	Overheads	1140.5	8%
	Subtotal (A+B+C+D)	**14149.5**	100%
E	Cost of vacant bed (Indirect Cost)	9285.9	
	Grand Total (Subtotal + E)	**23435.4**	

GIPSA	PACKAGE DAYS	GW	SHARING	SINGLE ROOM
	2	42500	46750	51000

Finding: Viable

The differential costs of Ureteroscopic Lithotripsy for material was 6%, for manpower 80%, equipment only 6% and overheads 8%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 14,150.

Grand total after cushioning comes to Rs 23,435.

GIPSA Package offered for general ward is Rs 42,500 for Ureteroscopic Lithotripsy.

Even after adding cost of vacant bed, some amount of profit margin was found. Therefore, Ureteroscopic Lithotripsy under packages offered to patients is financially viable for the hospital.

Cost of Transurethral Resection of Prostrate

	Cost heads	Amount (in Rupees)	Component of total cost
A	Material (drugs & disposables)	4083.2	18%
B	Manpower	14925.0	67%
C	Equipment	1391.5	6%
D	Overheads	1944.4	9%
	Subtotal (A+B+C+D)	**22344.2**	100%
E	Cost of vacant bed (Indirect cost)	12782.7	
	Grand Total (Subtotal +E)	**35126.9**	

GIPSA	PACKAGE DAYS	GW	SHARING	SINGLE ROOM
	4	51000	55250	59500

Finding: Viable

The differential costs of Transurethral Resection of Prostrate for material was 18%, for manpower 67%, equipment only 6% and overheads 9%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 22,344

Grand total after cushioning comes to Rs 35,127.

GIPSA Package offered for general ward is Rs 51,000 for Transurethral Resection of Prostrate.

Even after adding cost of vacant bed, some amount of profit margin was found. Therefore, Transurethral Resection of Prostrate under packages offered to patients is financially viable for the hospital.

Cost of Extracorporeal shock wave lithotripsy

	Cost heads	Amount	Component of total cost
A	Material (drugs & disposables)	1033.0	11%
B	Manpower	6828.8	72%
C	Equipment	881.0	9%
D	Overheads	738.5	8%
	Subtotal (A+B+C+D)	**9481.3**	100%
E	Cost of vacant bed (Indirect cost)	5913.8	
	Grand Total (Subtotal +E)	**15395.1**	

GIPSA				
PACKAGE DAYS	GW	SHARING	DLX SHARING	SINGLE
DAYCARE	15300	17000	17000	18700

FINDING: NOT VIABLE (after including cost of vacant bed)

The differential costs of Extracorporeal shock wave lithotripsy for material was 11%, for manpower 72%, equipment only 9% and overheads 8%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 9,481

Grand total after cushioning comes to Rs 15,395.

GIPSA Package offered for general ward is Rs 15,300 for Extracorporeal shock wave lithotripsy.

After adding cost of vacant bed, negative profit margin was found. Therefore, Extracorporeal shock wave lithotripsy under packages offered to GIPSA patients is not financially viable for the hospital.

Also, tariffs of sharing and single rooms, would provide only break even for Extracorporeal shock wave lithotripsy.

Cost of Total Knee Replacement

	Cost heads	Amount	Component of total cost
	Material (drugs & disposables)		
A	Manpower	17289.8	32%
B	Equipment	30919.3	58%
C	Overheads	1958.2	4%
D	Subtotal (A+B+C+D)	3486.9	6%
	Cost of vacant bed (Indirect cost)	**53654.2**	100%
E	Grand Total (Subtotal +E)	25455.0	
	GRAND TOTAL(subtotal + E)	**79109.2**	

TARIFF	PACKAGE DAYS	GW	SHARING	SINGLE	DELUXE	SUPERDELUXE
GIPSA	7	76500	93500	106250	N.A.	N.A.
TPA	5	N.A.	92500	100000	115000	125000
CASH	7	85000	119000	131700	148700	170000

FINDINGS:

Not viable for GIPSA rates in General ward.

The differential costs of Total Knee Replacement for material was 32%, for manpower 58%, equipment only 4% and overheads 6%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 53,654

Grand total after cushioning comes to Rs 79,109.

GIPSA Package offered for general ward is Rs 76,500 for Total Knee Replacement .

Cash Package offered for general ward is Rs 85,000 for Total Knee Replacement

After adding cost of vacant bed, negative profit margin was found. Therefore, Total Knee Replacement under packages offered to GIPSA patients is not financially viable for the hospital.

Also, tariffs of TPA in sharing, and self pay patients, would provide only break even for Total Knee Replacement.

Cost of Laminectomy

	Cost heads	Amount	Component in total cost
A	Material (drugs & disposables)	6666.7	19%
B	Manpower	26651.3	75%
C	Equipment	383.6	1%
D	Overheads	2056.6	6%
	Subtotal (A+B+C+D)	**35758.2**	100%
E	Cost of vacant bed (Indirect cost)	20364	
	Grand Total (Subtotal +E)	**56122.2**	

	GIPSA			
Package Days	Gw	Sharing	Dlx Sharing	Single
7	72250	80750	80750	93500
Implants Extra				

Finding: Viable

The differential costs of Laminectomy for material was 19%, for manpower 75%, equipment only 1% and overheads 6%.

The subtotal, which includes material, manpower, equipment and overheads comes to Rs 35,758

Grand total after cushioning comes to Rs 56,122.

GIPSA Package offered for general ward is Rs 72,250 for Laminectomy.

Even after adding cost of vacant bed, some amount of profit margin was found. Therefore, Laminectomy under packages offered to patients is financially viable for the hospital.

Overall Findings

	Viability	COST		TARIFF			MARGIN (%)			MARGIN 2(%)		
		SUBTOTAL	GRAND TOTAL	CASH	GIPSA	TPA	CASH	GIPSA	TPA	CASH	GIPSA	TPA
Cholecystectomy Cash	YES	23555	40044	47500	N.A.	N.A.	50	N.A.	N.A.	20	N.A.	N.A
Cholecystectomy Credit	YES	22373	38034	N.A.	55250	44500	N.A.	60	50	N.A.	35	20
Inguinal Hernia	YES	22030	37451	N.A.	51000	N.A.	N.A.	63	N.A.	N.A.	37	N.A
ESWL	NO	9481	16118	N.A.	15300	N.A.	N.A.	38	N.A.	N.A.	-1	N.A.
TURP	YES	22344	37985	N.A.	51000	N.A.	N.A.	59	N.A.	N.A.	36	N.A.
URSL	YES	14150	23435	N.A.	42500	N.A.	N.A.	70	N.A.	N.A.	50	N.A.
TKR	NO	53654	79109	76500	85000	N.A.	37	30	42	7	-3	14
Laminectomy	YES	35758	60789	N.A.	77250	N.A.	N.A.	51	N.A.	N.A.	22	N.A.

The surgical procedures which are viable are Laparoscopic Cholecystectomy, Laparoscopic repair of inguinal hernia, Transurethral resection of prostrate, Ureteroscopic lithotripsy, and laminectomy.

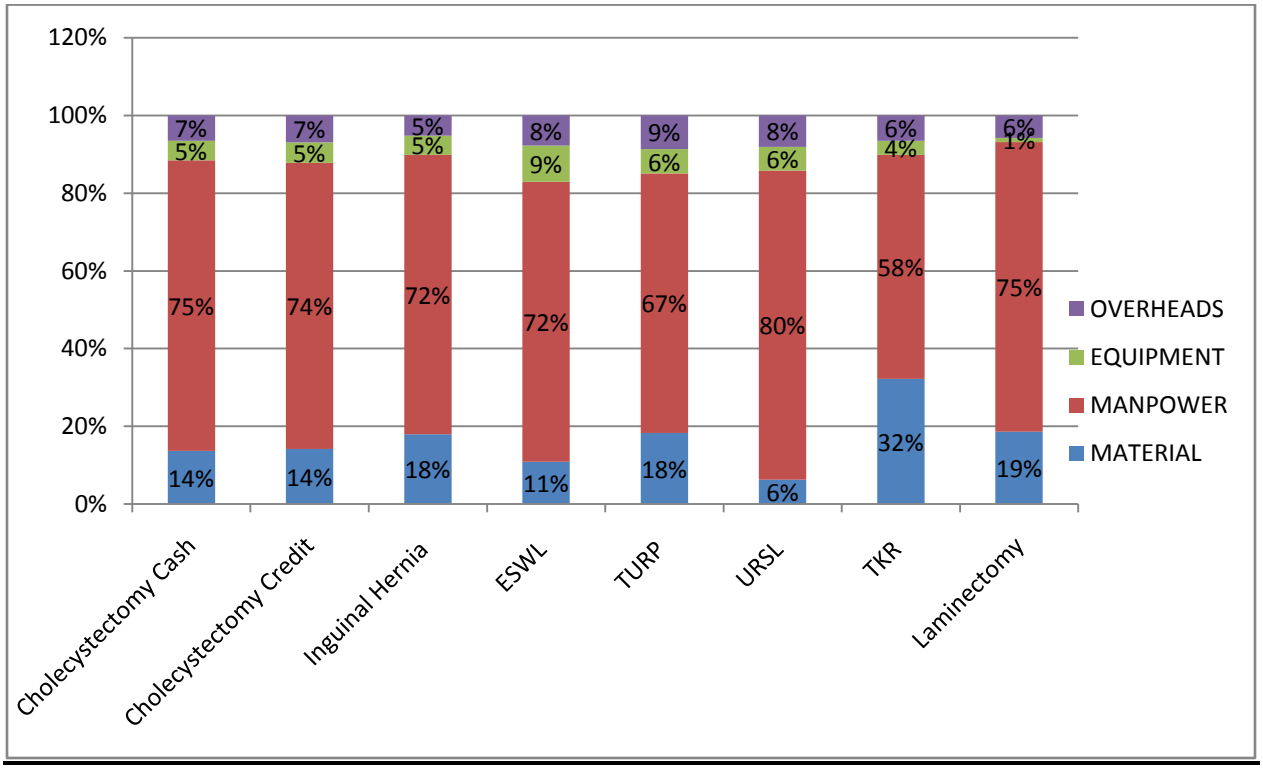
Extracorporeal shock wave lithotripsy and Total knee replacement, although show viability independently are not able to absorb the cost of vacant beds, and therefore considered non viable financially.

Profit margins range from 30 to 63 percent, without adding cost off vacant bed.

However, margins drop heavily after adding costs of vacant beds, sometimes to negative values.

This indicates, inadequate cost absorption in the perspective of the hospital.

COST HEADS AT A GLANCE (EXCLUDES CUSHIONING)



The components of cost heads can be seen clearly in the above graph.

Inferences:

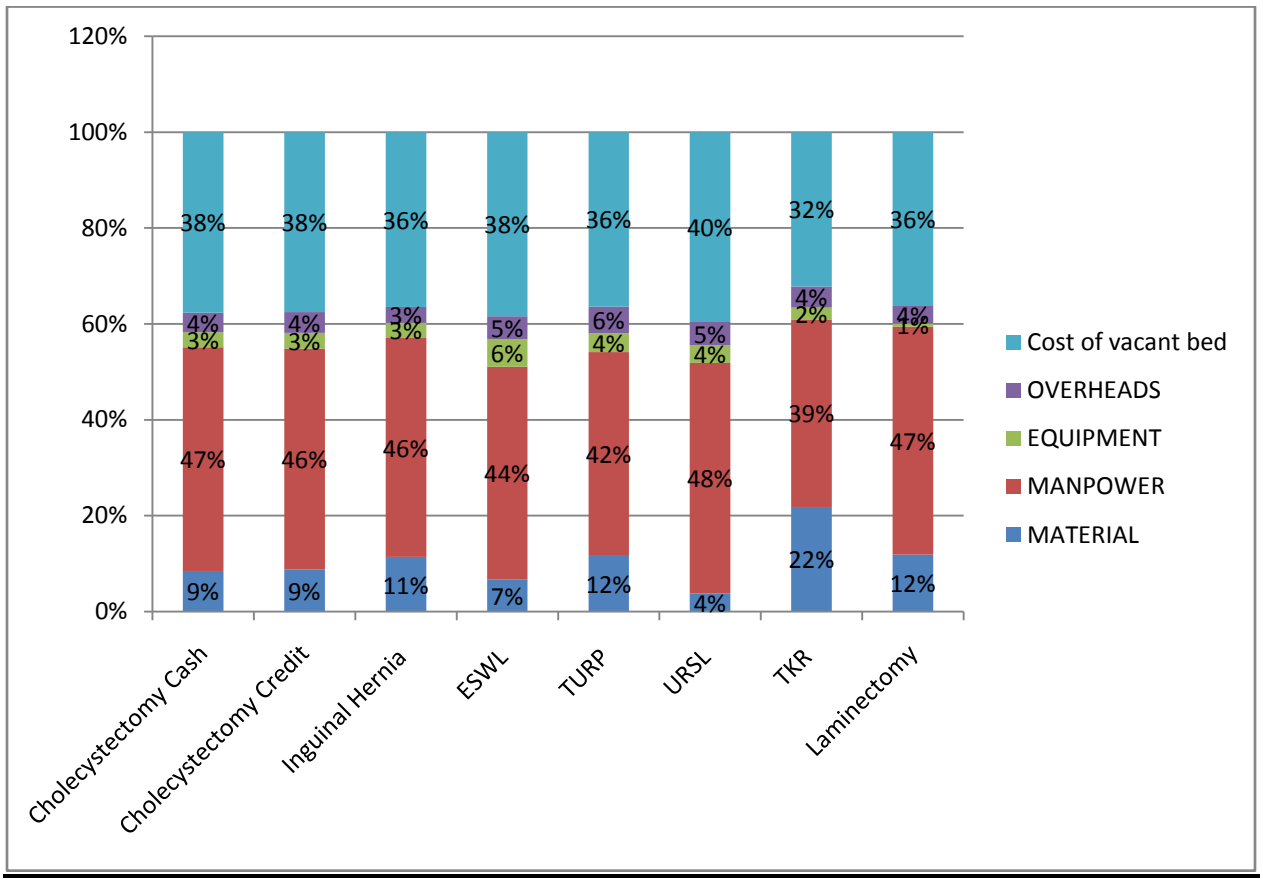
Material costs range from 6 to 32 percent.

Manpower takes up most of the cost, ranges from 58 to 80 percent.

Equipment cost takes up 1 to 9 percent.

Overheads take up 5 to 9 percent.

COST HEADS AT A GLANCE (INCLUDES CUSHIONING)



The components of cost heads after adding cost of vacant beds can be seen clearly in the above graph.

Inferences:

Material costs now range from 4 to 22 percent.

Manpower takes up most of the cost, ranges from 39 to 48 percent.

Equipment cost takes up 1 to 6 percent.

Overheads take up 3 to 6 percent.

Cost of vacant bed ranges from 32 to 40 percent.

DROP IN PROFIT MARGINS AFTER CUSHIONING

	GIPSA	TPA	CASH
Cholecystectomy Cash	N.A	N.A	**30**
Cholecystectomy Credit	**30**	**25**	N.A
Inguinal Hernia	**25**	N.A	**28**
ESWL	**39**	N.A	N.A
TURP	**23**	N.A	N.A
URSL	**20**	N.A	N.A
TKR	**42**	28	**30**
Laminectomy	**29**	**N.A**	N.A

The above figure gives a picture of drop in profit margins after cushioning. As cost absorption is imperative to manage low bed occupancy, the importance of cushioning cannot be understated.

Cushioning or cost absorption of empty beds causes profit margins to drop from 20 to 42 percentage points.

This emphasizes the fact, that profits earned from certain procedures is only compensating for the loss of revenue from an empty bed. In the service industry, a lost service cannot be sold on another day and thus cannot be recovered past the day.

8. DISCUSSION:

The surgeries analyzed are the key procedures of the hospital under consideration. Packages offerred are for cash and credit patients.

The fixed hospital tariff for cash/self pay patients is charged. Credit patients are provided with GIPSA (General Insurance Public Sector association) rates for 4 government insurance schemes and rates fixed under Memorandum of Understanding (MoUs) with various Third Party administrators (TPAs) tied up with the hospital.

Among the packages of services provided, laparoscopic cholecystectomy, laparoscopic repair of inguinal hernia, ureteroscopic lithotripsy, transurethral resection of prostrate and laminectomy were found to be financially viable. Extracorporeal shock wave lithotripsy and total knee replacement were not found to be financially viable after adding the cost of vacant beds for the purpose of cushioning lost revenue or break even.

Major cost portion was found to be taken up by manpower that range from 58-80%. This amount is similar to fractions of manpower cost calculated in costing studies owing to higher salary structure in tertiary and quaternary care hospitals.

Calculated from a representative sample, surgery-specific costs can be a basis for developing a fee structure. The cost information from this study can help hospital administrators understand the efficiency of their system and set charges (especially at private hospitals, which charge specific amounts for different medical services). The study also helps policymakers in setting or revising provider payment rates. [4]

Operational costs depend largely on bed occupancy or number of procedures perormed as it affects the average cost per procedure. For example, even though the operational costs of the surgical units of the charitable hospital and the private teaching hospital were not significantly different, there were huge differences in the average cost per procedure (rupees 41 607 at the charitable hospital vs rupees 5958 at the private teaching hospital). One of the reasons was the number of surgeries performed by these two hospitals during our study period. While there were only 319 procedures performed at the charitable hospital, the number was 2055 at the private

teaching hospital. Therefore, the charitable hospital administrator should examine the reasons for the low caseloads at the operating theatre.[4]

9. CONCLUSION:

The present study provides the cost of performing 7 key surgeries in the concerned quaternary care hospital from provider perspective, using a micro costing approach. This cost estimate can be used for comparison between different tariffs and managerial decision making to continue or discontinue agreements with insurance companies or third party administrators.

Although, the analysis depicts financial viability of most of the procedures, the profits earned range from 37- 63%.Cost of vacant bed represents 41% of total cost after cushioning.Adding cost of unoccupied beds causes the profit margins to drop 22-42 percentage points.Manpower takes up the highest fraction,58-80%, in the components of entire costing of each procedure.

10. RECOMMENDATIONS

10.1. Revision of tariffs and Memorandum of Understandings with insurance companies is required.

10.2. The cost of vacant beds cannot be ignored as they affect the overall cost of each procedure, hence marketing efforts for conversion of outpatients to inpatients is the need of the hour.

10.3. A modification in payments payables to the surgeons may be required for cost containment.

11. LIMITATIONS

11.1 The sample collected for the study was limited to a period of three months only.

11.2 Pre operative and follow up costs were not included.

11.3 Cases with multiple surgeries and co morbidities have been excluded from the study.

12. REFERENCES

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