

Dissertation Training

at

Aakash Healthcare Pvt. Ltd.

On

**STANDARDIZING THE SURGICAL KITS FOR MAJOR ORTHOPAEDIC
PROCEDURES FOR COMMONLY PERFORMED SURGERIES AT
AAKASH HEALTHCARE**

By

**Dr. Sakshi Jain
PG/16/049**

Under the guidance of

Dr. Manish Priyadarshi

Post Graduate Diploma in Hospital and Health Management
2016-18



**International Institute of Health Management Research
New Delhi**

ACKNOWLEDGEMENT

Words can never be enough to express my sincere thanks to **Dr. Aashish Chaudhry** for providing an opportunity to work at **Aakash Healthcare Limited**, Hospital Marketing & Sales Team and especially **Dr. Ranvir Singh Saluja** (AMS-Aakash Healthcare)

I convey my gratitude to **Mr. Kanishak Gautam** (Dy. Manager – Operations) who provided me with valuable insights to the subject.

I also thank **Dr. Supten Sarbadhikari** (Dean Academics & Student Affairs, IIHMR) without whom this project would have been a distant reality. I also express my thanks to my mentor **Dr. Manish Priyadarshi**, (Associate Professor) for extending his support. Most of all, I pay my sincere offering to the almighty without whose grace I would not be able to add a new dimension to my life.

Last but not the least; I am thankful to all the colleagues for their help and extended support.

Dr. Sakshi Jain

(PG/16/049)

CONTENTS

S.No.	Topic	Page No.
1	List of Abbreviations	5
2	Overview of the Organization	6
3	Clinical Specialties	7
4	Departmental Stacking Plan	8
5	Introduction	9
6	Review of Literature	10
7	Objective	13
8	Research Methodology	14
9	Study Findings(Surgical specialities and case load)	15
10	Orthopedic Surgeries Breakup	16
11	Most frequently performed surgeries	19
12	Surgical kit Preparation	20
13	Dicussion	29
14	Conclusion, Recommendation, and Limitation	30
15	Annexure	31
16	References	40

LIST OF TABLES

1	Surgical Specialties and case load	14
2	Orthopedic surgery breakup	15
3	Hot Sellers	18
4	Implant Removal large	19
5	Closed/open reduction and interlocking nailing of Tibia	21
6	Unilateral TKR	24

LIST OF ABBREVIATIONS

1. OT – Operation Theatre
2. ENT – Ear Nose Throat
3. TKR – Total Knee Replacement
4. THR – Total Hip Replacement
5. ORIF – Open Reduction Internal Fixation
6. CLIF – Closed Reduction Internal Fixation
7. TLIF – Transforaminal Lumbar Interbody Fusion
8. ACL – Anterior Cruciate Ligament
9. MCL – Middle Cruciate Ligament
10. PCL – Posterior Cruciate Ligament
11. PLC - Posterolateral Ligament Complex
12. PFN- Proximal Femoral Nailing
13. DHS – Dynamic Hip Screw
14. DCS – Dynamic Condylar Screw

OVERVIEW OF THE ORGANIZATION

Aakash Healthcare at Dwarka is the flagship hospital of the Aakash Group, which heralds the group's noble intention to enter the healthcare space. This hospital has been planned and designed as a 230 bedded tertiary care multi-specialty facility and has commissioned 100 beds in the first phase.

The Aakash Hospital is constructed across a sprawling 1.3-acre campus which is 230 bedded having 08 OTs, 70 Medical & Surgical Critical Care, 15 bedded dialysis unit and easily accessible from Delhi, Gurgaon and the Bahadurgarh.

VISION

To become the most desired healthcare brand by providing compassionate, caring and world class services with the help of talented team of doctors, professional and latest technology.

MISSION

To achieve highest patient satisfaction index by delivering patient centric, best healthcare services amongst the local and extended community.

CORE VALUES

I - Integrity

C - Compassion

A- Accountability

R- Respect

E- Excellence

SPECIALTIES

Key Specialties

Orthopedics & Joint Replacement

General & Minimal Access Surgery

Cardiology & Cardiac Surgery

Ophthalmology & Refractive Surgery

Mother & Child

Nephrology

Other Specialties

Anesthesiology& Pain Management	Medical Oncology
Blood Bank & Transfusion Medicine	Neurology
Critical Care	Neuro Surgery
Dentistry	Physiotherapy & Rehabilitation
Dermatology	Plastic & Cosmetic Surgery
Endocrinology	Preventive Health Check up
ENT	Pulmonology
Gastroenterology	Rheumatology
G I Surgery	Radiology
Hearing & Speech	Surgical Oncology
Internal Medicine	Trauma & Emergency (24X7)
Interventional Radiology	Urology
Lab Medicine	Vascular & Endo Vascular Surgery

INTRODUCTION

Surgery is a very ancient form of treatment which has been prevalent since ages. Early techniques were primitive, or even barbaric by today's standards, as anesthesia was not commonly used until the mid-to-late 1800s. Today, surgery takes a wide variety of forms and is often performed using minimally invasive techniques. This has shortened recovery times, improved outcomes and minimized complications for most patients. Surgery continues to evolve, with science making great strides on an almost daily basis. With globalization setting across the Healthcare, these procedures have become precise and standardized. Owing to the standardization the steps involved before, during and after the surgical intervention are more or less standardized and these standard operating protocols are followed in almost every operating suite of the planet. This leads to a standardized consumption of material not only for an independent surgery but for a particular type of case basis at large. Standardization can help maximize compatibility, interoperability, safety, repeatability and quality.

Our aim is to standardize the consumption of material in the surgeries so as to have minimum deviations and bring the fixed cost to a minimum. For this very purpose, we will analyze data of consumption for previous surgeries and define a standard kit for all such routine cases. In case it is an infected or high risk case, the components of kits may vary but such deviations are well accepted as they are vital requirements of surgery.

REVIEW OF LITERATURE

1. Cost savings of standardization of thoracic surgical instruments: The process of lean

Kyle H. Cichos BS, Paul L.Linsky MD, Benjamin Wei MD, Douglas J. Minnich MD, Robert J. Cerfolio MD, MBA

Foundation Objective is to demonstrate the impact that institutionalization of careful plate has on the quantity of instruments sanitized and on cost

Techniques - We checked on our most normally utilized careful plate with the 3 general thoracic specialists in our division and settled upon minimal number of careful instruments needed for mediastinoscopy, video-helped thoracoscopic medical procedure, automated thoracic medical procedure, and thoracotomy.

Results-We evacuated 59 of 79 instruments (75%) from the mediastinoscopy plate, 45 of 73 (62%) from the video-helped thoracoscopic medical procedure plate, 51 of 84 (61%) from the mechanical plate, and 50 of 113 (44%) from the thoracotomy plate. From January 2016 to December 2016, the assessed reserve funds by strategy were video-helped thoracoscopic medical procedure (n = 398) \$21,890, mechanical plate (n = 231) \$19,400, thoracotomy (n = 163) \$15,648, and mediastinoscopy (n = 162) \$12,474. Assessed add up to reserve funds were \$69,412. The heaviness of the plate was lessened 70%, and the non steamed disinfection rate (opened plate that should have been reprocessed) diminished from 2% to 0%. None of the specialists asked for any of the expelled instruments.

Conclusions - Standardization of thoracic careful plate is conceivable regardless of having numerous thoracic specialists. This procedure of lean (the evacuation of nonvalue steps or gear) diminishes the quantity of instruments cleaned and conveyed and lessens cost. It might likewise decrease the frequency of "wet loads" that require the resterilization of instruments.

2. The Impact of Standardized Order Sets on Quality and Financial Outcomes

David J. Ballard, MD, MSPH, PhD; Gerald Ogola, MS, MPH; Neil S. Fleming, PhD; Dave Heck, MD; Julie Gunderson, RN, BSN, MM ; Raaj Mehta; Roger Khetan, MD; Jeffrey D. Kerr, MD

Objective: The target of this undertaking was to valuate effect of an institutionalized request set on quality and money related execution.

Strategies: We led an observational investigation to look at arrange set use by healing center, release month, seriousness of sickness and danger of mortality for pneumonia patients between March 2006 and September 2007. We likewise evaluated affect on in-healing facility mortality and 30-day readmission rates utilizing four measures: (1) Cox relative dangers relapse, (2) Joint Commission Core Measures consistence utilizing calculated relapse, (3) length of stay, and (4) budgetary pointers utilizing vigorous relapse techniques for very skewed information.

Results: An aggregate of 3,301 patients met the incorporation criteria. More than 19 months, arrange set utilize expanded by 55 percent. Request set utilize fundamentally enhanced in-healing center mortality [hazard proportion (95 percent certainty interim (CI): 0.66 (0.45; 0.97) or 0.67 (0.46; 0.98); and Core Measures consistence (relative hazard, 95 percent CI: 1.24 (1.04; 1.48) or 1.22 (1.02; 1.45)] after covariate or penchant score chance modification.

Conclusion: Evidence-based pneumonia arrange sets can lessen inpatient mortality and increment conveyance of essential care forms.

3. The cost of waste of consumable materials in a surgical center

Liliana Cristina de Castro, Valeria Castilho

Objectives:to distinguish the sorts, amounts and cost of the consumable materials sent, utilized, returned unopened and squandered in careful tasks; to group the frequencies of waste as avoidable or unavoidable misfortunes, and to ascertain the rate of misuse of the consumable materials in the peri-agent period in the Surgical Center of a São Paulo college healing facility.

Method:a expressive exploratory contextual investigation with a quantitative approach. The accommodation test compared to 105 kinds of consumable materials sent for the 275 tasks saw amongst February and May 2011.

Results:the things squandered most were careful sutures, careful cotton sutures, and bandage packs. The aggregate cost of the waste was R\$ 709.84. The mean level of waste in the example was 9.34%, of which 1.23% was avoidable and 8.14% unavoidable.

Conclusion:the contemplate prove that the successful administration of material assets decreases the expenses of the procedures, and lessens squander.

4. Selecting Surgical Instrumentation for Specific Procedures

Szczepan Baran, VMD, Matthew Flegal, Elizabeth Johnson, VMD and Marcel Perret-Gentil, DVM

The choice of instrumentation for particular rat surgeries in this portion of the arrangement, from essential techniques, for example, osmotic direct implantation to more intricate ones, for example, the gastric sidestep strategy. This data will take into account advance enhancement of careful instrument determination.

One vital part of surgery advancement is the use of fitting careful instruments. Picking the suitable instruments takes into consideration delicate and exact tissue taking care of, which diminishes tissue injury and a neighborhood provocative reaction. These carefully prompted changes can affect the elucidation of histological outcomes. Careful instruments are regularly extremely particular and have maybe a couple particular employments. These packs can be adequate for fundamental techniques, for example, subcutaneous pump implantation. In any case, more intricate systems, for example, catheterization and microsurgical techniques require extra, more method particular instrumentation.

Proper instrumentation choice can be testing notwithstanding for an accomplished specialist. Cost is of vital worry in the present economy. It is hard to distinguish proper careful units for particular methodology. It should likewise be perceived that built up careful packs can and will be adjusted by experienced specialists.

Synopsis -A specialist ought to be able to choose and utilize appropriate careful instruments for each surgery performed. The propriety of careful instrumentation will significantly affect the careful procedure and result. It is basic to recall that distinctive specialists regularly lean toward various instruments for similar strategies and this is to be urged to permit the best individual execution. Two banalities are still valid in medical procedure; "You get what you pay for" and "One size does not fit all.

AIM AND OBJECTIVES

General Objective

To standardise the surgical kits for major orthopaedic procedures for commonly performed surgeries at Aakash Healthcare.

Specific Objective:

1. To understand the surgical trends in terms of volume in orthopaedic Department.
2. Identifying the most frequently Performed surgeries in Orthopaedic Department.
3. To study the direct cost involved in performing the 3 procedures and define surgical kits for the same.

RESEARCH QUESTION

1. What are the surgical trends in orthopaedic department and list down the surgeries in terms of volume?
2. What are the most commonly done procedures in Orthopaedics Department?
3. What are the items that contribute to the direct cost involved in performing the 3 procedures and define surgical kits for the same?

RESEARCH METHODOLOGY

Study type- Descriptive analytical study

Study area- Aakash Healthcare, Super Specialty Hospital, New Delhi

Study Period- 5th Feb to 28th April, 2018

Study Population- Orthopedic procedures performed at Aakash Healthcare

Sample size- Total Surgeries Performed from Oct 2017- Feb 2017

Sampling Technique- Complete sample population is taken as sample size on account of limited availability of data owing to lesser number of cases performed.

Limitation - Purchase price and sale price of all products have been excluded from the study owing to the confidentiality of the organization as per their policy

STUDY FINDINGS/RESULTS

1. Surgical Trends in Orthopaedic Department

Number of OT in the hospital are 8, out of which 4 are glass OT in which mainly the orthopaedic surgeries are carried out if the case is not a infected case, 1 is gynae OT, 1 emergency OT and procedure room and 2 are general OT. Ortho surgeries are carried out in glass OT because the cleaning and sterilization maintenance is better in glass OT and chances of surgical site infection are less. Orthopaedic is the main specialty out of all surgical specialties of the hospital.

Surgical specialties of the hospital with the case load is given in table below (cases from October2017- February 2018)

Surgical Specialties and Case load- Table - 1

Specialty	Case load(Oct 2017- Feb 2018)
Orthopedics & Joint Replacement	192
Ophthalmology & Refractive Surgery	107
General & Minimal Access Surgery	108
Cardio Thoracic Vascular Surgery	8
Ear Nose Throat	22
Neurosurgery	11
Obstetrics and Gynecology	156
Pediatrics Surgery	6
Urology	42
Plastic & Cosmetic Surgery	16
Total surgeries performed	678

2. Orthopaedic Surgery Breakup

An in depth analysis of all orthopedic procedures conducted in the facility was undertaken, where every single case performed by the team was accounted for. This activity was undertaken to understand the case load in terms of variety of cases being performed. The outcomes of the same are given in the consecutive table. A total of 84 varieties of cases were performed 192 times, out of which top 10 were considered hot sellers. We narrowed down to the 3 cases from these top 10 for further study.

Orthopaedic Surgery Breakup - Table -2

S. No.	Procedure	Numbers
1	IMPLANT REMOVAL LARGE	10
2	BIPOLAR HEMIARTHROPLASTY	9
3	DEBRIDEMENT SMALL (ORTHO)	9
4	CLOSED /OPEN REDUCTION AND INTERLOCKING NAILING OF TIBIA	8
5	DEBRIDEMENT LARGE (ORTHO)	7
6	CLOSED /OPEN REDUCTION AND INTERLOCKED NAILING OF FEMUR	6
7	PFN FOR PROXIMAL FEMORAL FRACTURE	6
8	K WIRE FIXATION OF FINGER	5
9	ORIF # PROXIMAL HUMERUS LOCKING PLATE	5
10	UNILATERAL - TOTAL KNEE REPLACEMENT(TKR)	5
11	ACL (FIX PACKAGE)	4
12	BILATERAL - TOTAL KNEE REPLACEMENT(TKR)	4
13	ORIF BIMALLEOLAR FRACTURE ANKLE	4
14	ORIF MEDIAL/LATERAL MALLEOLUS	4
15	ORIF SUPRA CONDYLAR FEMUR PLATING	4
16	ARTHROSCOPIC MENISECTOMY PARTIAL/ SUBTOTAL Â ARTHROSCOPIC MENISECTOMY PARTIAL/ SUBTOTAL Â ARTHRO	3
17	BONE GRAFTING (MEDIUM)	3

18	ORIF # BOTH BONE FOREARM PLATE/ NAIL	3
19	ORIF # HUMERUS WITH LOCKING PLATE	3
20	ORIF WRIST	3
21	UNILATERAL - TOTAL HIP REPLACEMENT(THR)	3
22	ABOVE KNEE / ABOVE ELBOW POP SLAB /CAST	2
23	ARTHROSCOPIC BANKART REPAIR	2
24	ARTHRODESIS 1 LEVEL POSTERIOR –SPINE	2
25	BIOPSY BONE AND SOFT TISSUE	2
26	CARPEL TUNNEL RELEASE OPEN	2
27	CLOSED REDUCTION AND K WIRE FIXATION FOR WRIST	2
28	COMPLEX DISTAL RADIUS #	2
29	CURETTAGE+ BONE GRAFTING FOR ABC/GCT/LYTIC LESSION/OM	2
30	DEBRIDEMENT AND EXTERNAL FIXATION OF COMPOUND FRACTURE LONG BONE UPPER LIMB DEBRIDEMENT AND EXTERN	2
31	IMPLANT REMOVAL SMALL	2
32	ORIF # HUMERUS PLATING NAIL/PLATE	2
33	ORIF # SINGLE BONE OF FOREARM LOCKING PLATE	2
34	ORIF # TIBIA WITH LOCKING PLATE	2
35	ORIF SINGLE BONE FOREARM PLATE/ NAIL	2
36	ORIF TIBIA PLATING	2
37	ORIF TIBIAL PLATEAU	2
38	SIMPLE DISTAL RADIUS #	2
39	SKIN GRAFTING – LARGE	2
40	SKIN GRAFTING – SMALL	2
41	TIBIA FRACTURE PROXIMA/MIDDLE/DISTAL ORIF/ CRIF WITH NAILING / LOCKING	2
42	TKR - BL (FIXPACKAGE)	2
43	TLIF 1 LEVEL WITH DECOMPRESSION	2
44	ACL REPAIR	1
45	ACL/MCL/PCL RECONSTRUCTION	1
46	ACUTE TENDON REPAIR (SINGLE)	1
47	ARTHRODESIS ANTERIOR + POSTERIOR –SPINE	1
48	ARTHROSCOPIC DEBRIDEMENT	1
49	ARTHROSCOPIC REPAIR LARGE CUFF TEAR	1
50	BELOW KNEE/ ELBOW POP SLAB/CAST	1
51	BIOPSY OPEN	1
52	BIOPSY SPINE TRANSPEDICULAR	1
53	BONE GRAFTING BIG	1
54	CERVICAL DISC REPLACEMENT 1 LEVEL WITH DECOMPRESSION	1
55	CLOSE REDUCTION IN OT(UNDER GA)/EMERGENCY (SEDATION)	1

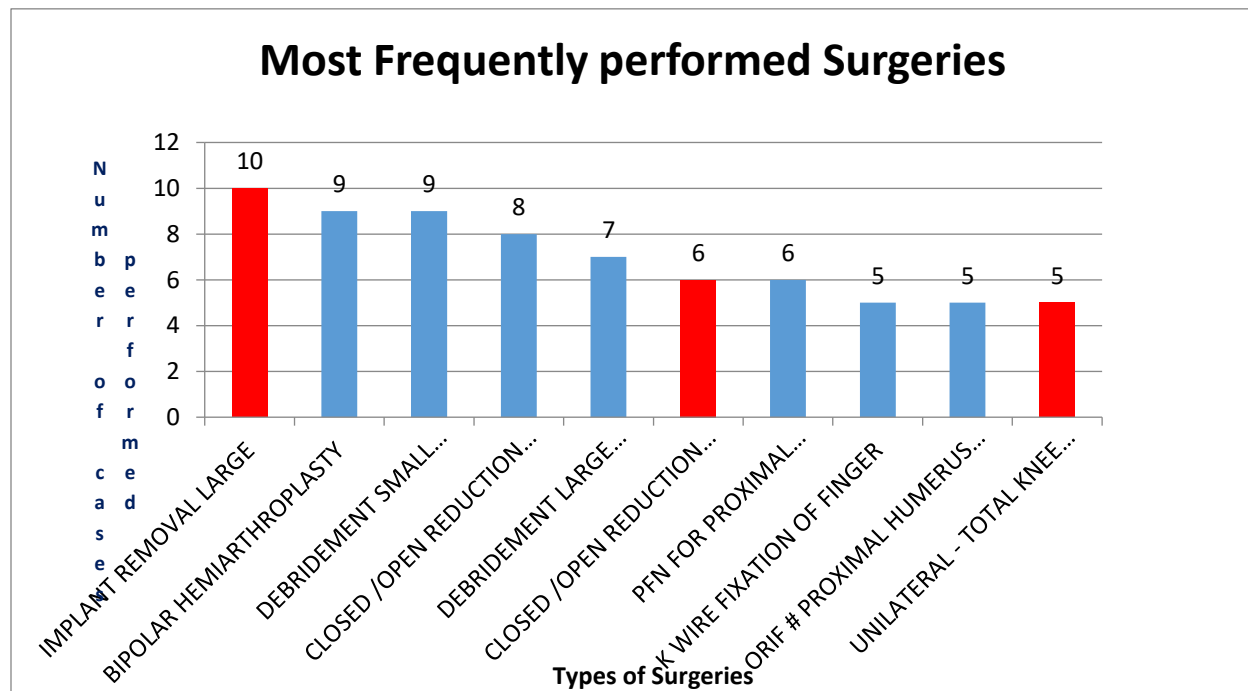
56	CLOSE REDUCTION OF DISLOCATIONS HIP AND LOWER EXTRIMITIES UNDER GENERAL ANESTHESIA IV SEDATION OR G	1
57	COMPLEX ORIF HAND	1
58	COMPLEX ORIF WRIST	1
59	COMPLEX SOFT TISSUE PROCEDURE	1
60	CORE DECOMPRESSION U/L HIP	1
61	DEBRIDEMENT AND EXTERNAL FIXATION OF COMPOUND FRACTURE LONG BONE LOWER LIMB	1
62	DEBRIDEMENT AND EXTERNAL FIXATION OF COMPOUND TIBIA	1
63	DECOMPRESSION SPINE POSTERIOR APPROACH/ LAMINECTOMY >3 LEVELS	1
64	DECOMPRESSION SPINE POSTERIOR APPROACH/ LAMINECTOMY 1LEVEL	1
65	DECOMPRESSION SPINE POSTERIOR APPROACH/ LAMINECTOMY 2 -3 LEVELS-SPINE	1
66	DHS/DCS (COMPLEX)	1
67	ELBOW COMPLEX ARTHROLYSIS	1
68	IMPLANT REMOVAL FROM SHOULDER	1
69	KYPHOSIS CORRECTION SPINE	1
70	ORIF # ANKLE TRIMALLEOLAR	1
71	ORIF # PATELLA	1
72	ORIF ACETABULUM (COMPLEX)	1
73	ORIF CLAVICLE	1
74	ORIF FRACTURE CALCANEUM	1
75	ORIF INTER/INTRA CONDYLAR REGION OF HUMERUS	1
76	ORIF LATERAL CONDYLE HUMERUS (PAEDIA)	1
77	ORIF LONG BONE	1
78	ORIF OLECRANON (TBW/ PLATING)	1
79	ORIF PHALANX/METACARPAL	1
80	ORIF TALUS	1
81	PLC (Posterolateral ligament complex) Repair	1
82	THUMB SPICA SLAB/CAST	1
83	TLIF II LEVEL WITH DECOMPRESSION	1
84	Grand Total	192

3. Most Frequently performed Surgeries

Most frequently performed surgeries of the Orthopaedic department are shown in the table below. These top 10 surgeries makes to be as 37% of the total surgeries performed in Orthopaedic department. Out of these top 10 surgeries 3 are selected for the detail study and surgical kit preparation.

Most frequently performed surgeries - Table-3

S.No	Specialty	Procedure	Numbers
1	Orthopaedics	IMPLANT REMOVAL LARGE	10
2	Orthopaedics	BIPOLAR HEMIARTHROPLASTY	9
3	Orthopaedics	DEBRIDEMENT SMALL (ORTHO)	9
4	Orthopaedics	CLOSED /OPEN REDUCTION AND INTERLOCKING NAILING OF TIBIA	8
5	Orthopaedics	DEBRIDEMENT LARGE (ORTHO)	7
6	Orthopaedics	CLOSED /OPEN REDUCTION AND INTERLOCKED NAILING OF FEMUR	6
7	Orthopaedics	PFN FOR PROXIMAL FEMORAL FRACTURE	6
8	Orthopaedics	K WIRE FIXATION OF FINGER	5
9	Orthopaedics	ORIF # PROXIMAL HUMERUS LOCKING PLATE	5
10	Orthopaedics	UNILATERAL - TOTAL KNEE REPLACEMENT(TKR)	5



4. Surgical kit preparation

Implant removal large, Closed/open reduction and interlocking nailing of Tibia and Unilateral TKR are the 3 selected out of 10 most frequently performed surgeries. Old data analysis is used to make the surgical kits. Data from October 2017 to February 2018 is extracted for the surgeries of orthopaedic department. Consumables and drugs used in surgery were counted for each surgeries and average of each consumables and drugs was calculated.

(A) Implant Removal Large Surgical Kit - Table -4

Items for Surgery (A) Implant Removal Large	Consumables	Drugs
ABDOMINAL SPONGES WITH X-RAY 30X30X12PLY SOFTLAPS 1X1	12	-
ATROPIN SULPHATE 1ML INJECTION RATHI	-	1
BENZOSSED 10ML INJ(MIDAZOLAM)1X1 TRIOKAA	-	1
BUPITROY 0.5% INJ (BUPIVACAINE) 1X1 TROIKAA 1X20ML	-	1
BUPITROY HEAVY 0.5% INJ (BUPIVACAINE) 1x1 TROIKAA	-	1
C ARM COVER 1X1 SHI MEDIWEAR	2	-
CAUTRY PENCIL (VALLEYLAB E2516) COVIDIEN	1	-
COTTON BANDAGE 6 INCH HINDUSTAN BANDAGES	3	-
DISPOSABLE NEEDLE 18GX1.5 LIFELONG	2	-
DISPOSABLE NEEDLE BLISTER 24GX1" SAFEWAY LIFELONG	3	-
DYNAPLAST ADHESIVE 10CMX4-6MTR DATT	1	-
EASYCAINE-2% INJ(LIGNOCAINE)1X1	-	1
ECG ELECTRODES ADULT	9	-
EMESET 2MG INJ (ONDANSETRON) 1X 2ML CIPLA LTD	-	2
EXTENTION LINE 10CM 1X1 VIGGOWAY	1	-
FLEXI MASK (ADULT) 2 MTR 1X1 ROMSON	1	-
FORTWIN 2 ML INJ (PENTAZOCINE 30MG)1X2ML RANBAXY	-	2
GAMJEE PAD 15CMX20CM DATT	4	-

GAMJEE ROLL 10CMX3M DATT	1	-
GAUZE SWAB 7.5CMX7.5CMX12PLY DATT	42	-
GAUZE SWAB WITH X-RAY 10CMX10CMX12PLY DATT	2	-
GLOVES STERILE NO 6.5 SURGICARE	1	-
GLOVES STERILE NO 7 SURGICARE	7	-
GLOVES STERILE NO 7.5 SURGICARE	8	-
GLOVES STERILE NO 8 SURGICARE	1	-
GLOVES STERILE ORTHOPADIC 7.5 (P.F) SURGICARE	1	-
GYPSONA 15CM BSN	1	-
HANSAPLAST ROUND 250PC MEDITECH	1	-
I.V.SET GLODRIP ALPHA (GLOBAL MEDIKIT LIMITED)	2	-
MEDZOL 10ML INJECTION (MIDAZOLAM) THEMIS MEDICARE	-	1
N.S 1000ML (ALBERT DAVID) INJ FFS	1	-
NEEDLE DISPOVAN 26GX1.5"	2	-
NS 500ML (DENIS CHEM)1X1 (EURO HEAD)	1	-
PHENERGAN INJ (PROMETHAZINE 50MG)1X2ML ABBOTT	-	2
PRIME PAD PLUS CAST PADDING 15CM*3M	1	-
R.L 500ML (ALBERT DAVID) INJ FFS	4	-
SKIN STAPLER VIS1STAT 35W (TELEFLEX MEDICAL)	1	-
SODIUM CHLORIDE 0.9% 1X1000ML CLARIS	1	-
SPECICAN- 70ML SH-1074 1X1 ROMSONS	1	-
SPINAL NEEDLE 23G 1X1 BD	1	-
SPINAL NEEDLE 25G 1X1 BD	1	-
SPINAL NEEDLE 27G 1X1 BD	1	-
STERILE WATER FOR INJECTION 1X10ML NIRLIFE	-	1
SURGICAL BLADE NO.10- SURGEON'S	1	-
SURGICAL BLADE NO.15- SURGEON'S	1	-

SURGICAL BLADE NO.20- SURGEON'S	1	-
SURGICAL BLADE NO.23- SURGEON'S	1	-
SYRINGE DISPOSABLE 10 ML LS MOUNTED LIFELONG	4	-
SYRINGE DISPOSABLE 20 ML LS MOUNTED LIFELONG	1	-
SYRINGE DISPOSABLE 2ML LS MOUNTED LIFELONG	5	-
SYRINGE DISPOSABLE 5 ML LS MOUNTED LIFELONG	4	-
SYRINGE DISPOSABLE 50ML LS MOUNTED W/O NEEDLE LIFELONG	2	-
THEMICAINE-AD INJ(LIGNOCAINE AND ADRENALINE)1X1	-	1
TROLLEY COVER DISPOSABLE (120CMSX210CMX) SHI MEDIWEAR	3	-
VACCU SUCK SUCTION SET (STANDARD) 1X1 ROMSON	1	-
VICRYL 0 (NW2534) REVERSE CUTTING J&J	1	-
VICRYL 90 CM NW2382 (2-0)1X1 J&J	1	-
VICRYL 90 CM NW2421 (1)1X1 J&J	1	-

(B) Closed/open reduction and interlocking nailing of Tibia Surgical Kit – Table - 5

Items for surgery (B) Closed/open reduction and interlocking nailing of Tibia	Consumables	Drugs
ABDOMINAL SPONGES WITH X-RAY 30X30X12PLY SOFTLAPS 1X1	12	-
ACILOC INJECTION (RANITIDINE)	-	1
ARM SLING POUCH SMALL (C-01) TYNOR	1	-
ATROPIN SULPHATE 1ML INJECTION RATHI	-	1
BUPITROY 0.5% INJ (BUPIVACAINE) 1X1 TROIKAA 1X20ML	-	1
BUPITROY HEAVY 0.5% INJ (BUPIVACAINE) 1x1 TROIKAA	-	1
C ARM COVER 1X1 SHI MEDIWEAR	2	-
CAUTRY PENCIL (VALLEYLAB E2516) COVIDIEN	1	-
CLIPPER BLADE (REF.9680)1X1 3M	1	-
COTTON BANDAGE 4 INCH HINDUSTAN BANDAGES	1	-
COTTON BANDAGE 6 INCH HINDUSTAN BANDAGES	4	-

D.N.S 500ML (ALBERT DAVID) INJ FFS	1	-
DEXONA-8 MG INJ (DEXAMETHASON-8 MG) 1X2ML ZYDUS	-	1
DISPOSABLE NEEDLE 18GX1.5 LIFELONG	1	-
ECG ELECTRODES ADULT	5	-
EMESET 2MG INJ (ONDANSETRON) 1X 2ML CIPLA LTD	-	1
EXAMINATION GLOVES LARGE LATEX 1X20 (EXAM CARE)	1	-
EXAMINATION GLOVES MEDIUM LATEX 1X20 (EXAM CARE)	1	-
EXTENSION LINE 10CM VIGGOWAY-X VIGGO	1	-
EXTENSION LINE 150CM 1X1 VIGGOWAY	1	-
EXTENTION LINE 10CM 1X1 VIGGOWAY	1	-
FLEXI MASK (ADULT) 2 MTR 1X1 ROMSON	1	-
FOLEYS CATHETER LATEX 2-WAY-14F RUSCH	1	-
GAMJEE PAD 15CMX20CM DATT	3	-
GAMJEE ROLL 10CMX3M DATT	1	-
GAMJEE ROLL 15CMX3M DATT	1	-
GAUZE SWAB 10CMX10CMX12PLY DATT	10	-
GAUZE SWAB 7.5CMX7.5CMX12PLY DATT	15	-
GAUZE SWAB WITH X-RAY 10CMX10CMX12PLY DATT	4	-
GLOVES STERILE MICROPTIC 6.5 (P.F) SURGICARE	1	-
GLOVES STERILE NO 6.5 SURGICARE	2	-
GLOVES STERILE NO 7 SURGICARE	4	-
GLOVES STERILE NO 7.5 SURGICARE	5	-
GLOVES STERILE NO 8 SURGICARE	3	-
GLOVES STERILE ORTHOPADIC 7.5 (P.F) SURGICARE	1	-
GLOVES STERILE ORTHOPADIC 8.0 (P.F) SURGICARE	1	-
GLOVES STERILE ORTHOPADIC 8.5 (P.F) SURGICARE	1	-
HANSAPLAST ROUND 250PC MEDITECH	2	-

HANSAPLAST WASHPROOF JOHNSON & JOHNSON	1	-
I.V.SET GLODRIP ALPHA (GLOBAL MEDIKIT LIMITED)	1	-
KNEE IMMOBILIZER 22" XL (D-28) TYNOR	1	-
MASTERGRAFT GRANULES 10 CC MEDTRONIC	1	-
N.S 1000ML (ALBERT DAVID) INJ FFS	1	-
N.S 500ML (SKKL) INJ	2	-
N.S. 100ML (FLEXIDRIP) INJ CLARIS	1	-
NEEDLE DISPOVAN 26GX1.5"	1	-
NS 500ML (DENIS CHEM)1X1 (EURO HEAD)	1	-
PENCAN SPINAL NEEDLE 27G(4502051) B.BRAUN	1	-
PERINORM INJECTION 2ML (METOCLOPRAMIDE 10MG) 1X1 IPCA	-	1
PROXIMAL TIBIA PLATING TT SET SIGMA SU	1	-
RL 500 ML INJ (DENIS CHEM)1X1	2	-
ROMO VAC SET FG 12 1X1 ROMSON	1	-
SKIN STAPLER VISISTAT 35W (TELEFLEX MEDICAL)	1	-
SODIUM CHLORIDE 0.9% 1X1000ML CLARIS	1	-
SPINAL NEEDLE 22G 1X1 BD	1	-
SPINAL NEEDLE 26G 1X1 BD	1	-
SPINAL NEEDLE 27G 1X1 BD	1	-
STERILE WATER FOR INJECTION 1X10ML NIRLIFE	-	2
SUPRIDOL 50MG INJ (TRAMADOL) 1X1ML NEON	-	1
SURGICAL BLADE NO.10- SURGEON'S	1	-
SURGICAL BLADE NO.20- SURGEON'S	1	-
SURGICAL BLADE NO.23- SURGEON'S	1	-
SYRINGE DISPOSABLE 10 ML LS MOUNTED LIFELONG	2	-
SYRINGE DISPOSABLE 20 ML LS MOUNTED LIFELONG	1	-
SYRINGE DISPOSABLE 2ML LS MOUNTED LIFELONG	5	-

SYRINGE DISPOSABLE 5 ML LS MOUNTED LIFELONG	4	-
SYRINGE DISPOSABLE 50ML LS MOUNTED W/O NEEDLE LIFELONG	1	-
TEGADERM PAD 8526 3M	1	-
THEMICAINE 2% JELLY 30 G	-	1
THEMICORT-H 100 MG (HYDROCORTISONE SODIUM SUCCINATE INJ) 1X1 THEMIS	-	1
THREE WAY STOP COCK 1X1 VIGGO	1	-
TROLLEY COVER DISPOSABLE (120CMSX210CMX) SHI MEDIWEAR	3	-
URO BAG ROMO-10(DB1070-10)1X1 ROMSONS	1	-
VACCU SUCK SUCTION SET (STANDARD) 1X1 ROMSON	1	-
VASOCON 1ML INJ (ADERNALINE 1 MG) 1X1 NEON LABORATORIES	-	1
VICRYL 0 (NW2534) REVERSE CUTTING J&J	1	-
VICRYL 90 CM NW2421 (1)1X1 J&J	1	-

(C) Unilateral – Total Knee replacement Surgical Kit – Table - 6

Items for Surgery(C) Unilateral – Total Knee replacement	Consumables	Drugs
ABDOMINAL SPONGES WITH X-RAY 30X30X12PLY SOFTLAPS 1X1	3	-
ANAWIN 0.25% INJ(BUPIVACAINE 0.25%) 1X20ML NEON	-	1
ARTICULAR SURFACE HIGHFLEX XLPE (SMITH & NEPHEW)	1	-
ATROPIN SULPHATE 1ML INJECTION RATHI	-	1
BACTILEM 750MG INJ (CEFUROXIME) 1X1 EMCURE PHARMACEUTICALS	-	1
BACTILEM 750MG INJ(CEFUROXIME750)1X1EMCURE	-	1
BUPITROY 0.5% INJ (BUPIVACAINE) 1X1 TROIKAA 1X20ML	-	2
BUPITROY HEAVY 0.5% INJ (BUPIVACAINE) 1x1 TROIKAA	-	1
CAUTERY TIP CLEANER(BOT-35) BL	1	-
CAUTRY PENCIL (VALLEYLAB E2516) COVIDIEN	1	-
CAUTRY PLATE (VALLEYLAB E7507) COVIDIEN	1	-
CLING DRAPE SHI MED	1	-

COMBINED EPIDURAL SPINAL SET(18/27-100/491/718) PROTEX	1	-
COROLATE-0.2MG/ 1ML INJ (GLYCOPYROLATE)1X1	-	1
COTTON BANDAGE 6 INCH HINDUSTAN BANDAGES	2	-
CREPE BANDAGE 15CMX4MTR 3M	1	-
DEPOPRED 40MG/ML INJ (METHYL PREDNISOLONE) 1X2ML SUN	-	1
DEXTROSE 5% 500ML (ALBERT DAVID) INJ FFS	1	-
DISPOSABLE NEEDLE 18GX1.5 LIFELONG	1	-
EASYCAINE-2% INJ(LIGNOCAINE)1X1	-	1
EMESET 2MG INJ (ONDANSETRON) 1X 2ML CIPLA LTD	-	1
EPIDURAL MINIPACK SYSTEM 1- 18G(100/391/118) 1X1 PORTEX	1	-
EXAMINATION GLOVES LARGE LATEX 1X20 (EXAM CARE)	1	-
EXAMINATION GLOVES MEDIUM LATEX 1X20 (EXAM CARE)	1	-
EXTENTION LINE 10CM 1X1 VIGGOWAY	2	-
FEMORAL COMPONENT OXIDIZED ZIRCONIUM (SMITH & NEPHEW)	1	-
FLAMITAPE 7.5CM*5M (LEUCOPLAST)1X1 FLAMINGO	1	-
FLEXI MASK (ADULT) 2 MTR 1X1 ROMSON	1	-
FOLEYS CATHETER LATEX 2-WAY-14F RUSCH	1	-
FORTWIN 2 ML INJ (PENTAZOCINE 30MG)1X2ML RANBAXY	-	1
GAMJEE PAD 15CMX20CM DATT	3	-
GAMJEE ROLL 10CMX3M DATT	1	-
GAMJEE ROLL 15CMX3M DATT	1	-
GAUZE SWAB 7.5CMX7.5CMX12PLY DATT	30	-
GLOVES STERILE MICROPTIC 7.5 (P.F) SURGICARE	1	-
GLOVES STERILE NO 6.5 SURGICARE	1	-
GLOVES STERILE NO 7 SURGICARE	6	-
GLOVES STERILE NO 7.5 SURGICARE	9	-

GLOVES STERILE NO 8 SURGICARE	6	-
GLOVES STERILE ORTHOPADIC 8.0 (P.F) SURGICARE	1	-
GLOVES STERILE ORTHOPADIC 8.5 (P.F) SURGICARE	2	-
HANSAPLAST ROUND 250PC MEDITECH	2	-
HOOD COVER FOR HELMET (STRYKER)1X1 SHI MEDI	5	-
HUMINSULIN REGULAR 40IU INJ (HUMAN INSULIN) 1x1 LUPIN LABS	-	1
I.V.SET GLODRIP ALPHA (GLOBAL MEDIKIT LIMITED)	1	-
INSULIN SYRINGE U-40 DISPO VAN	1	-
INTRAFLON I.V. CANNULA 16G 1X1 ROMSON	1	-
IOBAN 6640 1X10 PCS 3M	1	-
KENACORT 40MG INJ (TRAIMCINOLONE) 1X1 ABBOTT	-	
LOX 2% ADR INJ (LIGONCAINE 21.3MG + ADR 0.005MG) 1X30ML	-	2
LUER LOCK SYRINGE 10ML 21X1.5" (PREMIUM PLUS)1X1 LIFELONG	1	-
MICROPORE TAPE 3 INCH DATT	1	-
N.S 1000ML (ALBERT DAVID) INJ FFS	2	-
N.S 500ML (SKKL) INJ	3	-
N.S. 100ML (FLEXIDRIP) INJ CLARIS	1	-
NEEDLE DISPOVAN 26GX1.5"	1	-
NS 3LTRS PLASTIC SKKL	-	1
OXIDIZED ZIRCONIUM FEMORAL COMPONENT SMITH & NEPHEW	1	-
PHENERGAN INJ (PROMETHAZINE 50MG)1X2ML ABBOTT	-	1
PRESSURE MONITORING LINE (200CM M-F) 1X1 POLYMED	1	-
R.L 500ML (ALBERT DAVID) INJ FFS	3	-
RL 500 ML INJ (DENIS CHEM)1X1	1	-
ROMO VAC SET FG 14 1X1 ROMSON	1	-
ROPIN 0.2% INJ (ROPIVACAINE) 1X50ML NEON LABORATORIES	-	1
SAW BLADE 116/95*19*1.27 MM(05.002.003) SYNTHES	1	-

SAW BLADE 116/95*25*1.27(05.002.103) SYNTHES MEDICAL	1	-
SKIN STAPLER VISISTAT 35W (TELEFLEX MEDICAL)	1	-
SPINAL NEEDLE 22G 1X1 BD	2	-
SPINAL NEEDLE 27G 1X1 BD	1	-
STERILE WATER FOR INJECTION 1X10ML NIRLIFE	-	2
SURGICAL BLADE NO.10- SURGEON'S	1	-
SURGICAL BLADE NO.23- SURGEON'S	1	-
SYRINGE DISPOSABLE 10 ML LS MOUNTED LIFELONG	3	-
SYRINGE DISPOSABLE 20 ML LS MOUNTED LIFELONG	4	-
SYRINGE DISPOSABLE 2ML LS MOUNTED LIFELONG	3	-
SYRINGE DISPOSABLE 5 ML HMD	2	-
SYRINGE DISPOSABLE 5 ML LS MOUNTED LIFELONG	3	-
SYRINGE DISPOSABLE 50ML LS MOUNTED W/O NEEDLE LIFELONG	3	-
TEGADERM FILM I.V. 1623 (6CM*7CM)1X1 3M	1	-
TEGADERM PAD 8526 3M	1	-
TEXID 500MG INJ (TRANEXAMIC 500MG) 1X5ML RAPROSS	-	1
THEMICAINE 2% JELLY 30 G	-	1
THEMICAINE-AD INJ(LIGNOCAINE AND ADRENALINE)1X1	-	1
THEMICORT-H 100 MG (HYDROCORTISONE SODIUM SUCCINATE INJ) 1X1 THEMIS	-	1
TITANIUM ALLOY TIBIAL COMPONENT SMITH & NEPHEW	1	-
TOTAL KNEE REPLACEMENT DRAPE SET 1X1 SHI MEDIWEAR	1	-
TROLLEY COVER DISPOSABLE (120CMSX210CMX) SHI MEDIWEAR	2	-
URO BAG ROMO-10(DB1070-10)1X1 ROMSONS	1	-
VACCU SUCK SUCTION SET (STANDARD) 1X1 ROMSON	2	-
VENEPORT I.V. CANNULA 20G 1X1 ROMSON	1	-
VICRYL 0 (NW2534) REVERSE CUTTING J&J	1	-
VICRYL 90 CM NW2421 (1)1X1 J&J	2	-

DISCUSSION

Orthopedic department of the hospital is a single surgeon unit so inventory is limited and usage is controlled. Old data analysis is done to find the number of consumables and drugs used in the particular type of surgery. Data from October 2017 to February 2018 is taken for analysis. Number of surgeries done in each of the surgical department is calculated. Maximum number of surgeries was done in Orthopaedic department from which the types of surgeries performed are analyzed. A total of 192 surgeries were done which were 84 in types. Out of these 84 surgeries top 10 most frequently performed surgeries are extracted. Finally, 3 surgeries were chosen to do further detail study and surgical kit preparation. 3 surgeries are Implant removal large, Closed/open reduction and interlocking nailing of Tibia and Unilateral TKR. For these surgeries the drugs and consumables were calculated for each case of each surgery and then average number of drugs and consumables are calculated for each type of surgery (to see the calculation of the final contents of the kit refer to annexure) Contents and size of the surgical kit is decided after the discussion with the team of orthopedic surgeons of the hospital.

CONCLUSIONS

1. Varieties of items in terms of brands are lesser in standardized surgical unit
2. Direct cost can be optimized using standard surgical kits
3. Replacing generic by ethical gives a huge margin of cost benefit for both the hospital and the patient.

RECOMMENDATIONS

- Standardize the operating cost for all the invasive procedures performed at Aakash Healthcare.
- Identifying the hot sellers for all other specialties and defining the surgical kits

ANNEXURE

Items of the Implant Removal Large kit	Comsumables	Drug	Consu. Avg	Drug avg.
ABDOMINAL SPONGES WITH X-RAY 30X30X12PLY SOFTLAPS 1X1	35		11.666667	0
ATROPIN SULPHATE 1ML INJECTION RATHI		2	0	0.6666667
BENZOSED 10ML INJ(MIDAZOLAM)1X1 TRIKAA		2	0	0.6666667
BUPITROY 0.5% INJ (BUPIVACAINE) 1X1 TROIKAA 1X20ML		2	0	0.6666667
BUPITROY HEAVY 0.5% INJ (BUPIVACAINE) 1x1 TROIKAA		3	0	1
C ARM COVER 1X1 SHI MEDIWEAR	4		1.3333333	0
CAUTRY PENCIL (VALLEYLAB E2516) COVIDIEN	1		0.3333333	0
COTTON BANDAGE 6 INCH HINDUSTAN BANDAGES	8		2.6666667	0
DISPOSABLE NEEDLE 18GX1.5 LIFELONG	4		1.3333333	0
DISPOSABLE NEEDLE BLISTER 24GX1" SAFEWAY LIFELONG	7		2.3333333	0
DYNAPLAST ADHESIVE 10CMX4-6MTR DATT	2		0.6666667	0
EASYCAINE-2% INJ(LIGNOCAINE)1X1		2	0	0.6666667
ECG ELECTRODES ADULT	25		8.3333333	0
EMESET 2MG INJ (ONDANSETRON) 1X 2ML CIPLA LTD		4	0	1.3333333
EXTENTION LINE 10CM 1X1 VIGGOWAY	2		0.6666667	0
FLEXI MASK (ADULT) 2 MTR 1X1 ROMSON	1		0.3333333	0
FORTWIN 2 ML INJ (PENTAZOCINE 30MG)1X2ML RANBAXY		4	0	1.3333333
GAMJEE PAD 15CMX20CM DATT	10		3.3333333	0
GAMJEE ROLL 10CMX3M DATT	2		0.6666667	0
GAUZE SWAB 7.5CMX7.5CMX12PLY DATT	125		41.666667	0
GAUZE SWAB WITH X-RAY 10CMX10CMX12PLY DATT	5		1.6666667	0
GLOVES STERILE NO 6.5 SURGICARE	1		0.3333333	0
GLOVES STERILE NO 7 SURGICARE	20		6.6666667	0

GLOVES STERILE NO 7.5 SURGICARE	24		8	0
GLOVES STERILE NO 8 SURGICARE	1		0.3333333	0
GLOVES STERILE ORTHOPADIC 7.5 (P.F) SURGICARE	2		0.6666667	0
GYPSONA 15CM BSN	3		1	0
HANSAPLAST ROUND 250PC MEDITECH	2		0.6666667	0
I.V.SET GLODRIP ALPHA (GLOBAL MEDIKIT LIMITED)	4		1.3333333	0
MEDZOL 10ML INJECTION (MIDAZOLAM) THEMIS MEDICARE		1	0	0.3333333
N.S 1000ML (ALBERT DAVID) INJ FFS	2		0.6666667	0
NEEDLE DISPOVAN 26GX1.5"	5		1.6666667	0
NS 500ML (DENIS CHEM)1X1 (EURO HEAD)	1		0.3333333	0
PHENERGAN INJ (PROMETHAZINE 50MG)1X2ML ABBOTT		4	0	1.3333333
PRIME PAD PLUS CAST PADDING 15CM*3M	1		0.3333333	0
R.L 500ML (ALBERT DAVID) INJ FFS	12		4	0
SKIN STAPLER V1S1STAT 35W (TELEFLEX MEDICAL)	1		0.3333333	0
SODIUM CHLORIDE 0.9% 1X1000ML CLARIS	2		0.6666667	0
SPECICAN- 70ML SH-1074 1X1 ROMSONS	2		0.6666667	0
SPINAL NEEDLE 23G 1X1 BD	2		0.6666667	0
SPINAL NEEDLE 25G 1X1 BD	1		0.3333333	0
SPINAL NEEDLE 27G 1X1 BD	3		1	0
STERILE WATER FOR INJECTION 1X10ML NIRLIFE		2	0	0.6666667
SURGICAL BLADE NO.10- SURGEON'S	3		1	0
SURGICAL BLADE NO.15- SURGEON'S	2		0.6666667	0
SURGICAL BLADE NO.20- SURGEON'S	2		0.6666667	0
SURGICAL BLADE NO.23- SURGEON'S	3		1	0
SYRINGE DISPOSABLE 10 ML LS MOUNTED LIFELONG	11		3.6666667	0

SYRINGE DISPOSABLE 20 ML LS MOUNTED LIFELONG	2		0.6666667	0
SYRINGE DISPOSABLE 2ML LS MOUNTED LIFELONG	13		4.3333333	0
SYRINGE DISPOSABLE 5 ML LS MOUNTED LIFELONG	10		3.3333333	0
SYRINGE DISPOSABLE 50ML LS MOUNTED W/O NEEDLE LIFELONG	5		1.6666667	0
THEMICAINE-AD INJ(LIGNOCAINE AND ADRENALINE)1X1		1	0	0.3333333
TROLLEY COVER DISPOSABLE (120CMSX210CMX) SHI MEDIWEAR	8		2.6666667	0
VACCU SUCK SUCTION SET (STANDARD) 1X1 ROMSON	3		1	0
VICRYL 0 (NW2534) REVERSE CUTTING J&J	2		0.6666667	0
VICRYL 90 CM NW2382 (2-0)1X1 J&J	2		0.6666667	0
VICRYL 90 CM NW2421 (1)1X1 J&J	1		0.3333333	0

Items of Closed/open reduction and interlocking nailing of Tibia	Comsumables	Drug	Consu.Avg	Drugavg.
ABDOMINAL SPONGES WITH X-RAY 30X30X12PLY SOFTLAPS 1X1	35		11.6666667	0
ACILOC INJECTION (RANITIDINE)		2	0	0.6666667
ARM SLING POUCH SMALL (C-01) TYNOR	1		0.3333333	0
ATROPIN SULPHATE 1ML INJECTION RATHI		1	0	0.3333333
BUPIROY 0.5% INJ (BUPIVACAINE) 1X1 TROIKAA 1X20ML		1	0	0.3333333
BUPIROY HEAVY 0.5% INJ (BUPIVACAINE) 1x1 TROIKAA		3	0	1
C ARM COVER 1X1 SHI MEDIWEAR	5		1.6666667	0
CAUTRY PENCIL (VALLEYLAB E2516) COVIDIEN	2		0.6666667	0
CLIPPER BLADE (REF.9680)1X1 3M	1		0.3333333	0
COTTON BANDAGE 4 INCH HINDUSTAN BANDAGES	1		0.3333333	0
COTTON BANDAGE 6 INCH HINDUSTAN BANDAGES	12		4	0
D.N.S 500ML (ALBERT DAVID) INJ FFS	2		0.6666667	0
DEXONA-8 MG INJ (DEXAMETHASON-8 MG) 1X2ML ZYDUS		1	0	0.3333333
DISPOSABLE NEEDLE 18GX1.5 LIFELONG	1		0.3333333	0

ECG ELECTRODES ADULT	15		5	0
EMESET 2MG INJ (ONDANSETRON) 1X 2ML CIPLA LTD		3	0	1
EXAMINATION GLOVES LARGE LATEX 1X20 (EXAM CARE)	2		0.6666667	0
EXAMINATION GLOVES MEDIUM LATEX 1X20 (EXAM CARE)	2		0.6666667	0
EXTENSION LINE 10CM VIGGOWAY-X VIGGO	1		0.3333333	0
EXTENSION LINE 150CM 1X1 VIGGOWAY	1		0.3333333	0
EXTENTION LINE 10CM 1X1 VIGGOWAY	1		0.3333333	0
FLEXI MASK (ADULT) 2 MTR 1X1 ROMSON	1		0.3333333	0
FOLEYS CATHETER LATEX 2-WAY-14F RUSCH	1		0.3333333	0
GAMJEE PAD 15CMX20CM DATT	7		2.3333333	0
GAMJEE ROLL 10CMX3M DATT	3		1	0
GAMJEE ROLL 15CMX3M DATT	2		0.6666667	0
GAUZE SWAB 10CMX10CMX12PLY DATT	30		10	0
GAUZE SWAB 7.5CMX7.5CMX12PLY DATT	45		15	0
GAUZE SWAB WITH X-RAY 10CMX10CMX12PLY DATT	10		3.3333333	0
GLOVES STERILE MICROPTIC 6.5 (P.F) SURGICARE	1		0.3333333	0
GLOVES STERILE NO 6.5 SURGICARE	6		2	0
GLOVES STERILE NO 7 SURGICARE	10		3.3333333	0
GLOVES STERILE NO 7.5 SURGICARE	13		4.3333333	0
GLOVES STERILE NO 8 SURGICARE	9		3	0
GLOVES STERILE ORTHOPADIC 7.5 (P.F) SURGICARE	1		0.3333333	0
GLOVES STERILE ORTHOPADIC 8.0 (P.F) SURGICARE	1		0.3333333	0
GLOVES STERILE ORTHOPADIC 8.5 (P.F) SURGICARE	2		0.6666667	0
HANSAPLAST ROUND 250PC MEDITECH	4		1.3333333	0
HANSAPLAST WASHPROOF JOHNSON & JOHNSON	2		0.6666667	0
I.V.SET GLODRIP ALPHA (GLOBAL MEDIKIT LIMITED)	1		0.3333333	0
KNEE IMMOBILIZER 22" XL (D-28) TYNOR	1		0.3333333	0

MASTERGRAFT GRANULES 10 CC MEDTRONIC	1		0.3333333	0
N.S 1000ML (ALBERT DAVID) INJ FFS	1		0.3333333	0
N.S 500ML (SKKL) INJ	4		1.3333333	0
N.S. 100ML (FLEXIDRIP) INJ CLARIS	1		0.3333333	0
NEEDLE DISPOVAN 26GX1.5"	3		1	0
NS 500ML (DENIS CHEM)1X1 (EURO HEAD)	2		0.6666667	0
PENCAN SPINAL NEEDLE 27G(4502051) B.BRAUN	1		0.3333333	0
PERINORM INJECTION 2ML (METOCLOPRAMIDE 10MG) 1X1 IPCA		1	0	0.3333333
PROXIMAL TIBIA PLATING TT SET SIGMA SU	3		1	0
RL 500 ML INJ (DENIS CHEM)1X1	6		2	0
ROMO VAC SET FG 12 1X1 ROMSON	1		0.3333333	0
SKIN STAPLER V1S1STAT 35W (TELEFLEX MEDICAL)	3		1	0
SODIUM CHLORIDE 0.9% 1X1000ML CLARIS	3		1	0
SPINAL NEEDLE 22G 1X1 BD	1		0.3333333	0
SPINAL NEEDLE 26G 1X1 BD	2		0.6666667	0
SPINAL NEEDLE 27G 1X1 BD	1		0.3333333	0
STERILE WATER FOR INJECTION 1X10ML NIRLIFE		4	0	1.3333333
SUPRIDOL 50MG INJ (TRAMADOL) 1X1ML NEON		1	0	0.3333333
SURGICAL BLADE NO.10- SURGEON'S	3		1	0
SURGICAL BLADE NO.20- SURGEON'S	1		0.3333333	0
SURGICAL BLADE NO.23- SURGEON'S	3		1	0
SYRINGE DISPOSABLE 10 ML LS MOUNTED LIFELONG	7		2.3333333	0
SYRINGE DISPOSABLE 20 ML LS MOUNTED LIFELONG	1		0.3333333	0
SYRINGE DISPOSABLE 2ML LS MOUNTED LIFELONG	13		4.3333333	0
SYRINGE DISPOSABLE 5 ML LS MOUNTED LIFELONG	11		3.6666667	0
SYRINGE DISPOSABLE 50ML LS MOUNTED W/O NEEDLE LIFELONG	3		1	0
TEGADERM PAD 8526 3M	1		0.3333333	0

THEMICAINE 2% JELLY 30 G		1	0	0.3333333
THEMICORT-H 100 MG (HYDROCORTISONE SODIUM SUCCINATE INJ) 1X1 THEMIS		1	0	0.3333333
THREE WAY STOP COCK 1X1 VIGGO	1		0.3333333	0
TROLLEY COVER DISPOSABLE (120CMSX210CMX) SHI MEDIWEAR	7		2.3333333	0
URO BAG ROMO-10(DB1070-10)1X1 ROMSONS	1		0.3333333	0
VACCU SUCK SUCTION SET (STANDARD) 1X1 ROMSON	3		1	0
VASOCON 1ML INJ (ADERNALINE 1 MG) 1X1 NEON LABORATORIES		1	0	0.3333333
VICRYL 0 (NW2534) REVERSE CUTTING J&J	3		1	0
VICRYL 90 CM NW2421 (1)1X1 J&J	3		1	0

Items of the Unilateral TKR	Consumables	Drug	Consu. Avg	Drug avg.
ABDOMINAL SPONGES WITH X-RAY 30X30X12PLY SOFTLAPS 1X1	5		2.5	0
ANAWIN 0.25% INJ(BUPIVACAINE 0.25%) 1X20ML NEON		1	0	0.5
ARTICULAR SURFACE HIGHFLEX XLPE (SMITH & NEPHEW)	2		1	0
ATROPIN SULPHATE 1ML INJECTION RATHI		1	0	0.5
BACTILEM 750MG INJ (CEFUROXIME) 1X1 EMCURE PHARMACEUTICALS		1	0	0.5
BACTILEM 750MG INJ(CEFUROXIME750)1X1EMCURE		1	0	0.5
BUPIROY 0.5% INJ (BUPIVACAINE) 1X1 TROIKAA 1X20ML		4	0	2
BUPIROY HEAVY 0.5% INJ (BUPIVACAINE) 1x1 TROIKAA		2	0	1
CAUTERY TIP CLEANER(BOT-35) BL	2		1	0
CAUTRY PENCIL (VALLEYLAB E2516) COVIDIEN	2		1	0
CAUTRY PLATE (VALLEYLAB E7507) COVIDIEN	1		0.5	0
CLING DRAPE SHI MED	2		1	0
COMBINED EPIDURAL SPINAL SET(18/27-100/491/718) PROTEX	1		0.5	0
COROLATE-0.2MG/ 1ML INJ (GLYCOPYROLATE)1X1		1	0	0.5

COTTON BANDAGE 6 INCH HINDUSTAN BANDAGES	4		2	0
CREPE BANDAGE 15CMX4MTR 3M	2		1	0
DEPOPRED 40MG/ML INJ (METHYL PREDNISOLONE) 1X2ML SUN		1	0	0.5
DEXTROSE 5% 500ML (ALBERT DAVID) INJ FFS	2		1	0
DISPOSABLE NEEDLE 18GX1.5 LIFELONG	3		1.5	0
EASYCAINE-2% INJ(LIGNOCAINE)1X1		2	0	1
EMESET 2MG INJ (ONDANSETRON) 1X 2ML CIPLA LTD		2	0	1
EPIDURAL MINIPACK SYSTEM 1- 18G(100/391/118) 1X1 PORTEX	2		1	0
EXAMINATION GLOVES LARGE LATEX 1X20 (EXAM CARE)	1		0.5	0
EXAMINATION GLOVES MEDIUM LATEX 1X20 (EXAM CARE)	1		0.5	0
EXTENTION LINE 10CM 1X1 VIGGOWAY	4		2	0
FEMORAL COMPONENT OXIDIZED ZIRCONIUM (SMITH & NEPHEW)	1		0.5	0
FLAMITAPE 7.5CM*5M (LEUCOPLAST)1X1 FLAMINGO	2		1	0
FLEXI MASK (ADULT) 2 MTR 1X1 ROMSON	1		0.5	0
FOLEYS CATHETER LATEX 2-WAY-14F RUSCH	1		0.5	0
FORTWIN 2 ML INJ (PENTAZOCINE 30MG)1X2ML RANBAXY		1	0	0.5
GAMJEE PAD 15CMX20CM DATT	5		2.5	0
GAMJEE ROLL 10CMX3M DATT	1		0.5	0
GAMJEE ROLL 15CMX3M DATT	1		0.5	0
GAUZE SWAB 7.5CMX7.5CMX12PLY DATT	40		20	0
GLOVES STERILE MICROPTIC 7.5 (P.F) SURGICARE	1		0.5	0
GLOVES STERILE NO 6.5 SURGICARE	2		1	0
GLOVES STERILE NO 7 SURGICARE	8		4	0
GLOVES STERILE NO 7.5 SURGICARE	12		6	0
GLOVES STERILE NO 8 SURGICARE	9		4.5	0
GLOVES STERILE ORTHOPADIC 8.0 (P.F) SURGICARE	1		0.5	0
GLOVES STERILE ORTHOPADIC 8.5 (P.F) SURGICARE	2		1	0

HANSAPLAST ROUND 250PC MEDITECH	2		1	0
HOOD COVER FOR HELMET (STRYKER)1X1 SHI MEDI	7		3.5	0
HUMINSULIN REGULAR 40IU INJ (HUMAN INSULIN) 1x1 LUPIN LABS		1	0	0.5
I.V.SET GLODRIP ALPHA (GLOBAL MEDIKIT LIMITED)	2		1	0
INSULIN SYRINGE U-40 DISPO VAN	2		1	0
INTRAFLON I.V. CANNULA 16G 1X1 ROMSON	2		1	0
IOBAN 6640 1X10 PCS 3M	2		1	0
KENACORT 40MG INJ (TRIAMCINOLONE) 1X1 ABBOTT		2	0	1
LOX 2% ADR INJ (LIGONCAINE 21.3MG + ADR 0.005MG) 1X30ML		2	0	1
LUER LOCK SYRINGE 10ML 21X1.5" (PREMIUM PLUS)1X1 LIFELONG	2		1	0
MICROPORE TAPE 3 INCH DATT	2		1	0
N.S 1000ML (ALBERT DAVID) INJ FFS	3		1.5	0
N.S 500ML (SKKL) INJ	4		2	0
N.S. 100ML (FLEXIDRIP) INJ CLARIS	1		0.5	0
NEEDLE DISPOVAN 26GX1.5"	1		0.5	0
NS 3LTRS PLASTIC SKKL		1	0	0.5
OXIDIZED ZIRCONIUM FEMORAL COMPONENT SMITH & NEPHEW	1		0.5	0
PHENERGAN INJ (PROMETHAZINE 50MG)1X2ML ABBOTT		1	0	0.5
PRESSURE MONITORING LINE (200CM M-F) 1X1 POLYMED	2		1	0
R.L 500ML (ALBERT DAVID) INJ FFS	4		2	0
RL 500 ML INJ (DENIS CHEM)1X1	1		0.5	0
ROMO VAC SET FG 14 1X1 ROMSON	2		1	0
ROPIN 0.2% INJ (ROPIVACAINE) 1X50ML NEON LABORATORIES		1	0	0.5
SAW BLADE 116/95*19*1.27 MM(05.002.003) SYNTHES	1		0.5	0
SAW BLADE 116/95*25*1.27(05.002.103) SYNTHES MEDICAL	1		0.5	0
SKIN STAPLER V1S1STAT 35W (TELEFLEX MEDICAL)	2		1	0

SPINAL NEEDLE 22G 1X1 BD	3		1.5	0
SPINAL NEEDLE 27G 1X1 BD	1		0.5	0
STERILE WATER FOR INJECTION 1X10ML NIRLIFE		3	0	1.5
SURGICAL BLADE NO.10- SURGEON'S	2		1	0
SURGICAL BLADE NO.23- SURGEON'S	2		1	0
SYRINGE DISPOSABLE 10 ML LS MOUNTED LIFELONG	5		2.5	0
SYRINGE DISPOSABLE 20 ML LS MOUNTED LIFELONG	7		3.5	0
SYRINGE DISPOSABLE 2ML LS MOUNTED LIFELONG	6		3	0
SYRINGE DISPOSABLE 5 ML HMD	3		1.5	0
SYRINGE DISPOSABLE 5 ML LS MOUNTED LIFELONG	6		3	0
SYRINGE DISPOSABLE 50ML LS MOUNTED W/O NEEDLE LIFELONG	6		3	0
TEGADERM FILM I.V. 1623 (6CM*7CM)1X1 3M	1		0.5	0
TEGADERM PAD 8526 3M	2		1	0
TEXID 500MG INJ (TRANEXAMIC 500MG) 1X5ML RAPROSS		2	0	1
THEMICAINE 2% JELLY 30 G		1	0	0.5
THEMICAINE-AD INJ(LIGNOCAINE AND ADRENALINE)1X1		1	0	0.5
THEMICORT-H 100 MG (HYDROCORTISONE SODIUM SUCCINATE INJ) 1X1 THEMIS		1	0	0.5
TITANIUM ALLOY TIBIAL COMPONENT SMITH & NEPHEW	2		1	0
TOTAL KNEE REPLACEMENT DRAPE SET 1X1 SHI MEDIWEAR	2		1	0
TROLLEY COVER DISPOSABLE (120CMSX210CMX) SHI MEDIWEAR	4		2	0
URO BAG ROMO-10(DB1070-10)1X1 ROMSONS	1		0.5	0
VACCU SUCK SUCTION SET (STANDARD) 1X1 ROMSON	4		2	0
VENEPORT I.V. CANNULA 20G 1X1 ROMSON	1		0.5	0
VICRYL 0 (NW2534) REVERSE CUTTING J&J	2		1	0
VICRYL 90 CM NW2421 (1)1X1 J&J	4		2	0

REFERENCES

1. David JB, M. M., Gerald O, Neil SF, Dave H, Julie G, R.B Mehta, et al. (n.d.). The Impact of Standardized Order Sets on Quality and Financial Outcomes.
2. Kyle HC, Paul LL, Benjamin W, Douglas JM, Robert JC (2017). *Cost Savings of Standardization of Thoracic Surgical Instruments: The Process of Lean*. The Annals of thoracic surgery.
3. Liliana Cristina de Castro, Valeria Castilho (n.d.). The cost of waste of consumable materials in a surgical center.