

Chapter 4

METHODOLOGY DEVELOPMENT

Key Messages

- Step down cost accounting involves the channelling of cost information: direct costs to the appropriate overhead, intermediate or cost centre; then from the overhead cost centres to the intermediate and final cost centres; and then from the intermediate cost centres to the final cost centres, until total costs are entirely distributed to the very units and wards that directly serve the patient.
- Many factors, such as utilization, sophistication of equipment, complexity of procedures, staff involvement, and even patient expectations affect total costs, but the primary interest in cost accounting lies in identifying the degree to which cost is affected by efficiency in service provision.
- Disease based costing incorporating step down cost accounting to gain costs for hospital stay and cost of investigations/procedures, patient specific treatment data on drugs and types of investigations/treatment procedures and time studies to assess staff costs of treatment processes, is an important strategy complementary to hospital based costing.

As the preliminary phase for developing a managerial accounting system at hospital level, cost accounting exercises were carried out in three different locations: Sri Jayawardenapura General Hospital (SJGH), Teaching Hospital Kurunegala (THK) and Base Hospital Kuliyaipitiya (BHK).

There were principally two purposes for implementing cost accounting by department at the selected hospitals:

- To understand the present situation regarding the collation of financial and clinical information in the different types of hospitals; and
- To obtain results from the cost accounting exercises, relating to hospital activities by department, based on the financial and clinical information in the financial year 2005.

Understanding the present situation regarding financial and clinical information in these institutions is important in order to:

- Assess how much information can be obtained in the present context; and
- Identify how much information can be obtained by improving/formalizing the data collection process.

The latter purpose, of obtaining results by department, through the cost accounting exercise, would allow for the evaluation of the adequacy of the calculation process, by facilitating the comparison of these cost accounting results with that derived through the financial information system.

Further in order to confirm the reliability of these results, obtained through the multi-purpose cost accounting exercise, simulation exercises can be adopted where the simulated values could then be compared with actual cost accounting results. Successful outcomes would then encourage the adoption of such costing systems in hospitals countrywide allowing for the development of a comprehensive national costing system.

This chapter first reports how the cost accounting method was developed through the case study in Sri Jayawardenapura General Hospital (see 4.1 and 4.2). The same method, with modifications to suit the different settings of the two pilot hospitals, was introduced to Base Hospital Kuliyaipitiya and Teaching Hospital Kurunegala on a pilot basis to test the applicability of the method. Chapter 5 describes the results of the two pilot implementations (sections 5.3.1 and 5.3.2).

Costing information is also important in assessing the burden of treating specific disease conditions. The last section (4.3) focuses on the costing of some selected conditions and treatment procedures at the same two hospitals in Kurunegala as well as at the Colombo North Teaching Hospital. Time studies were carried out at the Colombo North Teaching Hospital as part of this costing process. Here an attempt was made to value personnel costs through time studies (in

the context of determining disease management costs) under given treatment protocols. In disease based costing the ultimate objective is to develop standard protocols and epidemiological data bases which together with treatment specific/disease specific unit costing would allow for national level budgeting based on disease burden.

4.1 METHODOLOGY DEVELOPMENT THROUGH THE CASE STUDY AT SRI JAYAWARDENEPURA GENERAL HOSPITAL (SJGH)

4.1.1 RATIONALE FOR THE CASE STUDY

SJGH is the only hospital that is semi-independent in Sri Lanka. As the only fee levying hospital in the Sri Lankan public health system, it has been attempting to improve its hospital costing system by introducing the concept of Cost Centres. Therefore carrying out a case study in this hospital was considered important, as it would help the researchers identify the gaps existing in information flows in Sri Lankan hospitals. The findings would then be relevant in introducing costing systems to other Teaching and Provincial hospitals coming under the Line Ministry, since these are assumed to have a similar service provision structures.

Important characteristics of the SJGH, not existent in other public hospitals in Sri Lanka, are the existence of a Planning Unit in charge of cost accounting, and a Stock Control Unit (SCU) that administrates consumables such as drugs and medical care materials. These units also play an important role in collecting information. The role these units play is worth evaluating since the replication of these units in introducing costing systems in tertiary care institutions may be an important step in its successful implementation.

4.1.2 KEY FEATURES OF THE COST ACCOUNTING METHODOLOGY

A. DIFFERENTIATING DIRECT AND INDIRECT COSTS

Costs can be accrued by department, or Cost Centre, by first allocating to each Cost Centre all its direct costs. Direct costs are those costs that can be directly identified with or traced to a Cost Centre. For example, the salary cost of a laboratory technician is a direct cost of the laboratory. The drugs consumed in a ward are a direct cost of that ward. The two largest direct cost categories are medical supplies and staff.

After the allocation of all direct costs is completed, indirect costs need to be apportioned to the Cost Centres. Indirect costs are those that cannot be directly traced to or associated with a particular Cost Centre. For example, electricity cannot be directly attributed to any Cost Centre, as all Cost Centres benefit from electricity. Therefore such costs have to be apportioned to Cost Centres on bases that proximate the closest relationship between the cost and the service. It is important to bear in mind that indirect costs are a much smaller percentage of total costs than are the more straightforward direct costs.

B. THE STEP-DOWN APPROACH

The step-down cost accounting system here involves three levels of classification: from the more general to the more specific in allocating costs to final Cost Centres.

A Cost Centre can be defined as “a production or service location, function, activity or item of equipment for which costs are accumulated”.

The analysis of hospital costs was designed to accumulate costs by department or Cost Centre. The Cost Centres demarcated in this analysis were of *three* types: **overheads** (to accumulate overhead costs including administrative costs that are then shared out among the patient-related Cost Centres); **intermediate** (those that provide support, e.g., diagnostic services, to the final Cost Centres) and **final** (example medical departments that provide “final” services directly to patients, e.g., wards, outpatient clinics).

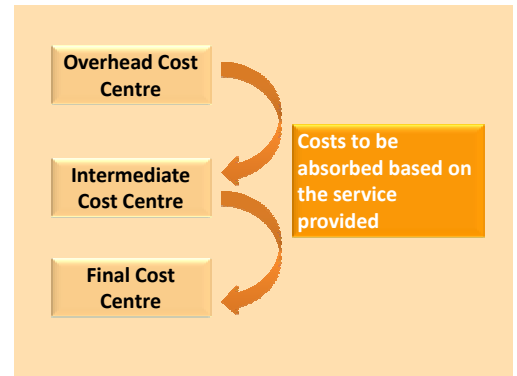


FIGURE 4- 1: DIAGRAMMATIC IMAGE OF STEP-DOWN COST ACCOUNTING

The ‘**step-down**’ approach is used, whereby costs are allocated to Cost Centres starting with each Cost Centre’s direct costs and then apportioning the indirect costs, making sure that each cost is ultimately allocated to the relevant final Cost Centre.

c. ACCRUING COSTS TO THE FINAL COST CENTRE

Cost accounting in a hospital can briefly be explained as a procedure to consolidate all costs generated within the hospital to the Final Cost Centres. The following measures are important in calculating this information as precisely as possible:

- Allocate as many expenses as possible to the Cost Centres directly.
- Formulate definite mechanisms for the apportionment of indirect expenses.
- Collate the necessary clinical information for the absorption of intermediate expenses in the co-medical category.

Following these procedures will support the development of accurate financial and clinical information systems and the integration of these two types of information to achieve a detailed management cost accounting system.

4.1.3 FINANCIAL OPERATIONS OF THE HOSPITAL

SJGH is a national hospital constructed with the support of the Japanese government in 1984. The total number of beds is 1,001, and the hospital accepts medical students for their practical training. Patients are admitted to the hospital on the same basis as to any other public hospitals except for the major difference that patients are charged a user fee in this hospital as it is deemed a semi-independent hospital.

This semi-autonomous state is reflected in its financial position: for example in 2004, 37% of its expenditure was covered by a grant from the government budget. The grant coverage increased to 47% in 2005 due to the necessity of meeting increased personnel costs resulting from changes to the government salary scales during this period.

The total expenditure of the hospital was 935 million LKR in 2004, rising to 1,090 million LKR in 2005, an increase of 17% (see figure 4.2). The breakdown is as follows: personnel expenses increased by 24%; material costs by 8%, and other expenses by 10%. Materials include drugs, surgical items, dressings, medical oxygen, laboratory chemicals and consumables, X-ray films and chemicals, general supplies, food and fuel. The material costs at SJGH are considered to be higher than that of other national hospitals. This is because the budget of other national hospitals is restricted, and so patients may be forced to buy drugs and materials at their own expense from a pharmacy outside the hospital when there are shortages in hospital stores. In contrast, while SJGH patients are charged for all such materials they add to expenditure as the hospital provides them. In addition a difference arises because SJGH calculates depreciation costs unlike other state hospitals.

This dependence on government funding goes against desired objective of setting up SJGH as a semi-autonomous healthcare institution. It is one of the major arguments for the management focusing on the pricing and costing systems of this hospital in detail, including deriving cost by Cost Centres.

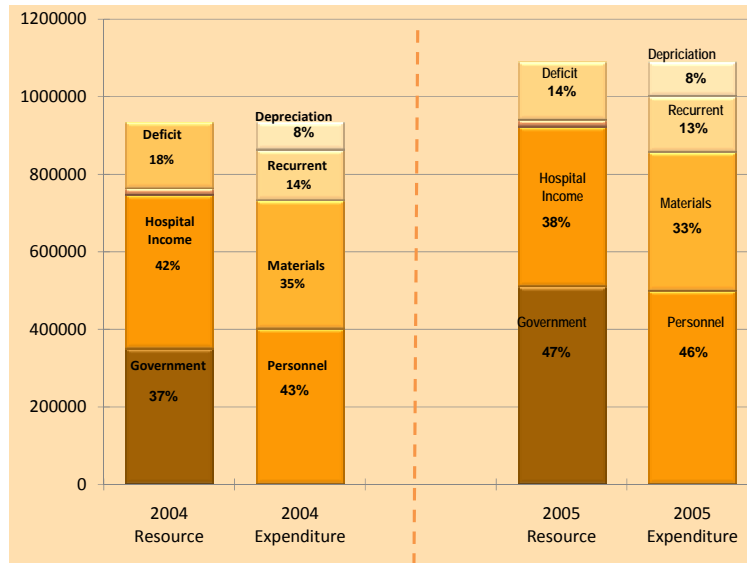


FIGURE 4- 2: DISTRIBUTION OF RESOURCES AND EXPENSES BY SOURCE¹

4.1.4 HOSPITAL FUNCTIONS AS RELATED TO COST ACCOUNTING

A. MEDICAL SERVICE FUNCTION (FINAL COST CENTRES)

The hospital's outpatient department consists of an OPD, Emergency Treatment Unit (ETU) and 19 clinics. Its inpatient department has 18 wards, including three paying-wards, General ICU and Cardio-thoracic ICU. In 2005, the total number of inpatients was 51,000, with an average length of stay of 4.6 days; the bed occupancy rate was 60.5%; and the total number of operation 15,000.

The hospital plays a major role in the treatment of heart disease. The Cardio-Thoracic Clinic and Cardiology Clinic examine an average of 152 patients per day. The Cardio-Thoracic Unit has one operating theatre, ICU (12 beds), and one specialised Ward that can admit a maximum of 20 inpatients. The bed occupancy rate for this unit constantly exceeds full capacity (average of 117.9%) with an average length of stay of 9.5 days. In 2005, 576 heart operations were conducted, and the demand increases annually. The number of open heart operations has increased by 56 cases since 2004 and closed heart operations by 58 cases as well.

B. CO-MEDICAL SERVICE FUNCTION (INTERMEDIATE COST CENTRES)

The SJGH model perceives only drug dispensing as a co-medical service function with x-rays and laboratory testing included under the overhead function.

¹SJGH Annual Accounts, 2004,2005

In 2005, the hospital's pharmacy consisted of an IDD (Indoor Dispensary) and ODD (Outdoor Dispensary). Since February 2006, however, the ODD has been entrusted to an external organisation, the Rajya Osusala, which is run by a national institution, the State Pharmaceutical Corporation (SPC).

In issuing drugs to wards the IDD uses two methods:

- Bed Head Ticket (BHT) system
- Store Requisition Note (SRN) system.

BHT is the patient's medical record, and drugs are ordered individually based on the patient's medical requirements. SRN is a form used at the time of ordering consumables for the ward in its entirety. The SRN is prepared in triplicate, with the original copy stored by the IDD and the other copies filed by the ward and the Stock Control Unit (SCU) (**Figure 4-3**).

In addition, relatively low priced internal medicine referred to as either Non-Accountable Drugs or Detail Accountable Drugs were issued only under the SRN system. They were issued to wards in units of 500 or 1000, and use was recorded per patient by the wards themselves. Approximately, a week's worth of such drugs was issued under the SRN system, so that the wards were ensured their stock each week.

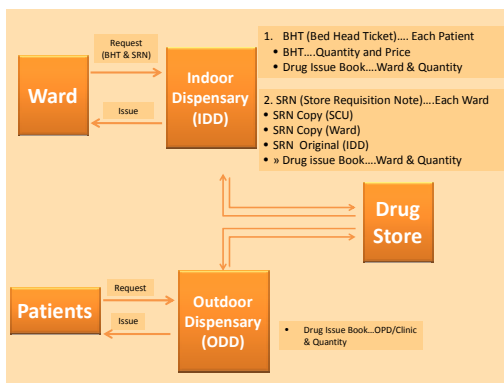


FIGURE 4- 3: DRUGS ISSUE FLOW

From 2006, the hospital discontinued drug issue through the SRN system, and changed to a new system where drugs are only issued under the BHT system. Therefore, drugs which were issued by the SRN are now issued under the BHT system, with a maximum issue of 3 days worth of drugs. As a result, the number of drug issues from IDD has increased. However, the amount of stock in each ward has reduced from 1 week's worth

to 3 days worth, and it has also reduced ward duties as it is no longer necessary to record each patient's drug usage in addition to filling out the SRN, but merely to make the BHT recording. The advantages of shifting to this system are cost reduction (due to a decrease in stocks in the ward and strengthened administration of drug usage by patients) and better information management, since recording is now restricted to the BHT.

Administrative and Support Service Function (Overheads Cost Centres) A wide range of units come under this category ranging from the Medical Record Office and Electro Mechanical engineering to the Accounts Department, the Mortuary and the telephone exchange. Some of the main cost centres coming under this category are discussed below.

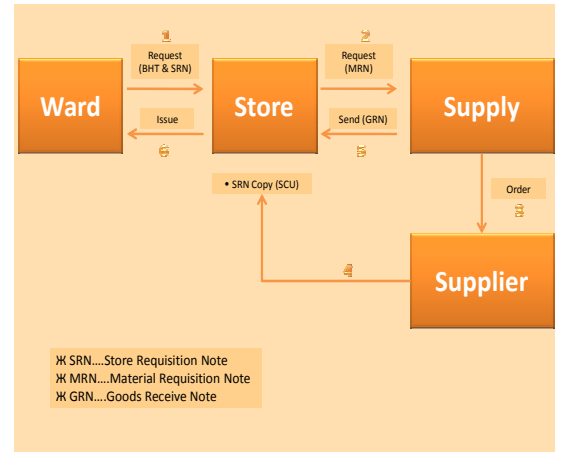


FIGURE 4- 4: DIET SUPPLY FLOW

The Supply Department places orders for the drugs and medical goods on behalf of other Departments and Units and the bills are paid for these items by the Accounting Department. Depending on the type of goods, they are stored in six locations: Main Store (for general items); Surgical Store; Dressing Store; Laboratory Store; X-ray Store and the Kitchen (Figure 4-5).

The Stock Control Unit (SCU) uses a computer in maintaining detailed information on the dressing and surgical items as issued per department, including the unit price and value.

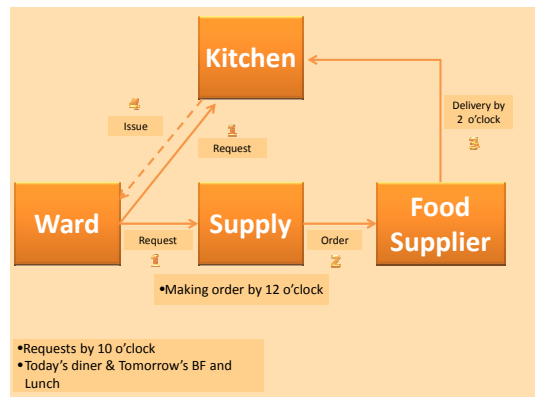


FIGURE 4- 5: DRESSING/SURGICAL ITEM & GENERAL ITEM ISSUE FLOW

The Accounts Department is positioned under the Hospital Director. In this department, there are 33 employees including an Accountant and an Assistant Accountant (AA). The main duties of the Department are payments for various goods purchased, collection of fees, budgeting, payroll calculation and the management of financial data. Book keeping is being done manually as well as using computers.

Only the Planning Unit, under the direct control of the Hospital Director, carries out cost accounting at SJGH. The Planning Unit has in the past carried out cost accounting exercises in the X-ray department and the Laboratory department, and for specific obstetric and ophthalmic operations. At present, the Planning Unit is carrying out a cost accounting exercise, repeated and revised every six months, relating to cardiac surgery (6 types of open and closed heart surgery).

4.1.5 PRESENT STATUS OF THE HOSPITAL MANAGEMENT INFORMATION SYSTEM

A. CLINICAL INFORMATION

Hospital clinical information is maintained by the Medical Records Department which comes under the Deputy Director of the hospital. A total of 23 employees (with the exception of Orderlies) including a Medical Record Officer (MRO) and an Assistant MRO (AMRO) belong to this department. This department is responsible for maintaining medical records for outpatients and inpatients, preparing various statistics (such as the number of patients, length of stay, patients' by ICD coding and discharge analysis (**Table 4- 1**), as well as collating clinical information from the X-ray Department, the Laboratory Department and the operation theatres, etc. Based on the information from other departments, this department also prepares a clinical statistical report, for the entire hospital, each month, to be used at the Hospital Board Meeting.

TABLE 4- 1: DISCHARGE ANALYSIS (YEAR 2005)

Services	Ward	Beds	Admission	Live discharge	Deaths	Av. length of stay	Av. daily sick	%bed occupancy
Paediatric	1	40	3432	3416	5	3.9	26.2	65.5
NICU	NICU	23	881	843	36	6.3	13.9	60.6
GYN & OBS	2	62	4583	4548		4.9	51.8	83.5
Paying 1	3	18	1293	1317	7	4.8	13.1	72.7
Paying 2	4	48	1978	1959	9	3.7	16.1	33.6
paying 2	5	48	2432	2374	1	3.7	19.5	40.6
Medical	6	62	5120	4955	127	4.6	52.7	85.0
	7A	26						
Nephrology	7B	30	1469	1431	31	6.1	20.6	68.7
	7C	4	78	74	1	4.1	0.7	18.4
Surgical	8	62	1958	1907	14	4.9	23.1	37.2
GYN & OBS	9	62	4270	4246	1	4.3	44.0	70.9
Orthopaedic	10	62	2103	2099	4	6.3	41.7	67.2
ENT	11	62	1743	1739		5.9	23.8	38.4
Medical	12	62	5168	5276	119	4.5	54.0	87.1
Surgical	14	62	2574	2555	8	6.3	42.0	67.8
Surgical	15	62	2427	2420	23	5.2	30.3	48.9
Eye	16A	32	1420	1420		4.7	15.3	48.0
	16B	30						
Medical	17	62	5039	4914	91	4.8	55.7	89.9
Cardio thoracic	18	20	853	819	4	9.5	23.6	117.9

Cardiothoracic	18ICU	11	610	484	33	1.9	8.7	79.4
CIU		19	32	1111	1138	8	5.2	11.5
Dialysis	Dys	11	3548	3617	5	1.0	10.9	99.5
Intensive	ICU/CCU	7	650	435	164	2.4	5.3	75.2
Total		1001	54740	53986	691	4.6	604.6	60.5

B. FINANCIAL INFORMATION

The Accounts Department is responsible for financial information management. Medical fees collected from patients are totalled per Ward or Clinic every day. A monthly accounting report is prepared and submitted to the Hospital Board Meeting for discussion. The contents of the monthly accounting report generally are as follows:

1. Income and Expenditure Statement for the month;
2. Budget variance from the month;
3. Income and Expenditure Statement to-date;
4. Budget variance to date;
5. Cash Flow statements for the month and to-date;
6. Other Income; and
7. Centre-wise Revenue Report

From 1 to 4, the total and the breakdown are reported. In the contents, the actual balance, the budgeted value and the variance are shown in a list, in accordance with individual account titles in the form of a financial statement. In this way, it is easy to find out whether each account is within the budget or exceeds the budget.

Regarding 5, in relation to receipts of cash and payments, monthly sums and yearly sums are shown. In the case of 6, the income from the ATM within the hospital, the Convenience Store's rent and their respective electricity charges, etc. are provided. Under 7, each ward, OPD and Clinic are listed as a Revenue Centre, and each Centre's cash income is totalled, which can then be compared with its respective expenditure.

In addition to these monthly reports, quarterly and yearly reports are prepared. In the quarterly report, the contents of the monthly reports as well as the number of staff are reported.

The present system of financial data collection at SJGH on the different cost elements such as personnel emoluments, drugs, dressings, consumables, diet costs and depreciation is presented in **Figure 4- 2**.

TABLE 4- 2: FINANCIAL INFORMATION OF SRI JAYAWARDENEPURA HOSPITAL

Personnel Emolument	The Accounts Department uses software customized for the hospital in maintaining personnel cost records and administrating individual salaries. Personnel remunerations are not administrated manually. Personnel costs per Cost Centre and per type of staff are summarized every month in a report. An annual summary is also prepared.
	Drug Cost The SCU finds out the unit price per drug and revises this information as needed. IDD keeps records of the amounts of each drug issued to the wards along with the date and the ward name using a drug issue book. ODD keeps records of the amount of each drug issued in the OPD and Clinics along with the date and the classification of OPD/Clinic. However, for Non-Accountable Drugs, there are no records of the amount of each drug issued by classification of OPD/Clinic.
	Dressing, Surgical Cost For recording Dressing and Surgical costs, SCU uses a computer where exclusive software has been installed, and finds out the price and the amount issued per item and calculates cost per Cost Centre.
Medical Material Cost	Diet Cost For hospital diet ingredients, Supplies finds out the quantity per Cost Centre and per type of diet, and places an order for ingredients with the Supplier, based on the quantity of diets. Information is administrated using a computer, which calculates the ingredient cost and the quantity of diets. By multiplying by the unit price, the total value of an order placed is calculated. Figures are inputted every day, and every month the consistency between the amount billed by the Supplier and the amount according to the orders placed is confirmed.
	Consumable Cost SCU maintains lists of prices of consumable supplies on a computer. Main Store finds out the amount of issues per item based on the record books, and the SCU also files bills for goods per Cost Centre. However, neither department inputs the data to a computer system at present.
Depreciation	Depreciation costs of the hospital have been calculated since its establishment, and depreciation calculation principles are adopted, in accordance with buildings, medical equipment and appliances/fixtures, etc. Also, since 1998 a ledger entry for individual depreciable assets has been administered using a computer, per appliance/fixture and per Cost Centre.

4.1.6 COST ACCOUNTING PROCESS AT SJGH

A. FINANCIAL AND CLINICAL COSTS

Managerial accounting has a wider scope that encompasses both financial and clinical information. The cost accounting exercise undertaken under the EBM Study uses the actual values from the financial accounts of 2005. It adopts the same cost line items as the hospital's accounting system. One difference however, is regarding the provision of gratuity: this should be recorded as part of personnel costs but as it is not a part of current hospital activities, for the moment this cost item has been excluded.

TABLE 4- 3: DATA COLLECTION FOR COST ACCOUNTING IN SJGH

Financial Information 2005			
Name	Type		From
Salary data	Cost centre-wise	Yearly total (Rs)	Accountant
Surgical data	Cost centre-wise	Yearly total (Rs)	Stock C
Dressing data	Cost centre-wise	Yearly total (Rs)	Stock C
Price of Drugs data	Average Price (Rs)		Stock C
Issue of Drugs data	Cost Centre-wise	Drug-wise (Quality)	Indoor D
Fixed Asset data	Cost Centre-wise	6 years total (Rs)	Accountant
Floor Area data	Cost Centre-wise		Director
Clinical Information 2006			
Section	Type		Period
Inpatient	No of patients (ward-wise)		12 months
Inpatient	Average length of stay (Ward-wise)		12 months
Outpatient	No of Patients (total)		12 months
Clinic-Patient	No of Patients (total)		12 months
X-ray	No of X-ray Patients (Cost Centre-wise)		12 months
CT	No of CT Patients (Cost Centre-wise)		12 months
Ultra Sound	No of US Patients (Cost centre-wise)		12 months
Path-Laboratory	No of Laboratory Patients (Cost Centre-wise/test-wise)		1 month
ECG	No of ECG Patients (Cost Centre-wise)		5 months
Endoscopy	No of Endoscopy Patients (Cost Centre-wise)		12 months
Physiotherapy	No of Physiotherapy Patients (Cost Centre-wise)		12 months
Kitchen	No of Diets (Cost Centre-wise)		12 months
Operating Theatre	No of Operations (Speciality-wise)		12 months
Blood Bank	No of Issue (Speciality-wise)		12 months
ICU	No of Patients (Ward-wise)		1 month
Paying Ward	No of Patients (Ward-wise)		1 month

B. COST CENTRES

Cost Centres refer to units that are considered separate entities in the determination of expenditure. The Cost Centres identified in the context of SJGH are given in **Table 4- 4**.

TABLE 4- 4: COST CENTRES IN SRI JAYAWARDENEPURA HOSPITAL

Cost Centre		Main Activity
Final Cost Centre		
1	Paediatric ward - 01	Age under 12 - General diseases
2	Gynaecological and Obstetrics Ward - 02	Pregnancy and Obstetric care
3	Medical Ward – 06	General Diseases
4	Nephrology Ward - 07	Kidney Diseases
5	Surgical Ward – 08	General Surgeries
6	Gynaecological and Obstetrics Ward - 09	Pregnancy and Obstetric care
7	Orthopaedic Ward -10	Orthopaedic Patients
8	E .N. T Ward – 11	E.N.T. Patients
9	Medical Ward -12	General Diseases

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10	Surgical Ward -14	General Surgeries
11	Surgical Ward -15	General Surgeries
12	Eye Ward -16	Eye Patients
13	Medical Ward -17	General Diseases
14	Cardio -thoracic Ward -18	Heart surgery Patients
15	Cardio -investigation unit Ward -19	Heart Investigation Patients
16	Neonatal Intensive Care Unit	Newly born with complications
17	Dialysis Unit	Renal failure Patients
18	Emergency Treatment Unit	Emergency Patient Treatment
19	Out Patient Department /Clinics	Treatment of ambulatory patients
20	Medical Check up	Medical Check
Intermediate Cost Centre (A)		
1	Paying Class 1 Ward - 03	Paying Patients
2	Paying Class 2 Ward - 04	Paying Patients
3	Paying Class 2 Ward - 05	Paying Patients
4	Intensive Care Unit	Intensive Care Patient
5	Operation Theatre	General Surgery
6	Cardio –thoracic Operating Theatre	Heart surgery
7	Labour room	Births
8	Cardio Investigation Unit	Cardio Investigation
Intermediate Cost Centre (B)		
1	Central Sterilized Supplies Department	Sterilize Equipment & Clothes
2	Pharmacy	Give Drugs - Indoor wards
3	X -ray unit	Take X -rays
4	Pathological Laboratory	Test Samples
5	Physiotherapy	Give physiotherapy
6	Blood bank	Collect, save and Issue Blood
7	Electro (ECG)/Electro Cardiography Encephalography (EEG)	Take ECG & EEG
8	Endoscopy	Test digestive system
9	Kitchen	Prepare Food for patients & staff
10	Laundry	Washing clothes
11	Sewing Room	Sew theatre clothes
Overhead Cost Centres		
1	Medical Record Office (M .R .O)	Keeping medical records
2	Electro Mechanical Engineering	Maintaining Medical Equipment
3	Maintenance	Hospital Maintenance
4	Mortuary	Unit for storing dead bodies
5	Telephone Exchange	Communication centre
6	Transport	Providing transport
7	Welfare	Staff welfare
8	Doctors Restaurants	Restaurants for Doctors
9	Chairman's Office	Office for Chairman
10	Director's Office	Office for Director
11	Deputy Director's Office	Office for Deputy Director

12	Secretary Office	Office for Secretary
13	Matron's Office	Matron's Office
14	Infective Control Unit	Infection control
15	Accounts Department	Financial recording/transactions
16	Establishments Department	Relates to the Institution
17	Supplies	Purchase of Materials
18	Internal Audit	Auditing Internal affairs
19	Library	Consulting reference material
20	General Stores	Storing materials
21	Government Audit	Government audit activities
22	Planning Unit	Prepare Corporate Plan
23	Stock Control Unit	Stock control
Exception		
1	Nurses Quarters	Residence for Nurses
2	Doctors Quarters	Residence for Doctors
3	Nursing Training School	Training for Nursing Students

c. ADOPTING STEP-DOWN COST ACCOUNTING

Cost accounting in a hospital can be briefly explained as a procedure to consolidate all costs generated within the hospital to the Final Cost Centres. This section sets out to explain how such an allocation was carried out based on information gathered through financial accounting at each Cost Centre. Figure 4.6 illustrates the steps to be taken in determining costs by cost centre.

c.1 FIRST STEP

This involves the allocation of costs that are clearly targeted to a particular cost centre to that centre: for example salaries of staff attached to one specific cost centre, drugs disbursed to a specific ward or equipment purchased for a particular unit.

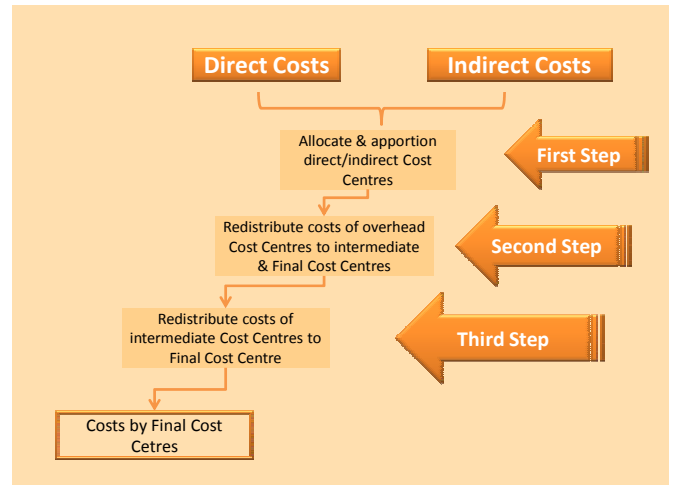


FIGURE 4- 6: THREE STEPS OF STEP-DOWN ACCOUNTING TO FINAL COSTS

- Apportioning of Indirect Costs

Indirect costs cannot be automatically apportioned to Cost Centres. Many different methods of apportioning indirect costs exist. Under this EBM study, indirect costs such as water and electricity were apportioned to the hospital Cost Centres on the basis of the engineer's estimates (50%) and the floor area of the individual Cost Centres (50%). Depreciation costs,

including building assets are apportioned based on the floor area of the individual Cost Centres, and other depreciable assets such as medical equipment are apportioned to the relevant Cost Centres based on the total acquisition values of the individual Cost Centres. The varied means adopted in apportioning indirect costs are given in **Table 4- 5**.

TABLE 4- 5: MEANS OF APPORTIONING INDIRECT COSTS

Expenses	Allocation and Apportionment bases	Note
Personnel Cost		
Personnel Cost	Cost Centre-wise Salary	Actual allocation
Travelling & Subsistence	Cost Centre-wise Salary rate	
Maternal Consumption		
Drugs	Cost Centre-wise Issue	Actual allocation
Surgical material	Cost Centre-wise Issue	Actual allocation
Dressings	Cost Centre-wise Issue	Actual allocation
Medical Oxygen	OT(30%), ICU(45%), NICU/Lab/CTOT(25%)	Information from EME
Lab chemicals & Consumables	Cost Centre-wise No of Laboratory Patients	
X-ray films & chemicals	Cost Centre-wise No of X-ray Patients	
General supplies	Cost Centre-wise No of Staff	
Food provision	Ward-wise No of Diets	
Linen and uniforms	Cost Centre-wise No of Staff	
Fuel	Cost Centre-wise No of Staff	
REPAIRS & MAINTENANCE	Cost Centre-wise No of Staff	
Utility Services		
Electricity	OT(35%), ICU/LR/X-ray(15%), Other(50%) Floor area	Information from Maintenance Engineer
Water	Kitchen(25%), Laundry(25%), Other(50%) Floor area	Information from Maintenance Engineer
Telephone	Cost Centre-wise No of Staff	
Other Items		
Condemned expired items	Drugs + Surgical + Dressings Issue rate	
Economic service charges	Establishment	
DEPRECIATION		
Building	Cost Centre-wise Floor area	
Equipment	Cost Centre-wise Fixed assets	
FINANCE COST	Establishment	

c.2 SECOND STEP

- Absorption of Overhead Cost Centre’s Costs

The Overhead Cost Centre’s costs are absorbed to the Final and Intermediate Cost Centres based on a single absorption basis per cost item regardless of possible differences in the breakdown of Overhead costs by type of Cost Centre. However different absorption bases are used for the different elements within the overheads cost structure.

With regard to the absorption bases, ‘number of patients’ is used for allocating costs of the Medical Record Office, Mortuary, Matron’s Office and ICN, as such elements of cost are considered to be closely related to patient numbers. Fixed assets are used as the basis for allocating the expenditure of the Electro Mechanical Engineering Unit, assuming that its’ main activity is the maintenance of equipment. Floor area is used for the Maintenance cost centre, given that its’ main activity is the maintenance of buildings and facilities. And the number of employees is used as the basis for redistributing cost of other Cost Centres (**Table 4- 6**).

TABLE 4- 6: ABSORPTION BASES AT OVERHEAD COST CENTRE

Overhead Cost Centre	Absorption base (Cost Centre-wise)
Medical Record Office	No of Patients
E.M.E.	Fixed assets
Maintenance	Floor area
Mortuary	No of Patients
Telephone exchange	No of Staff
Transport	No of Staff
Nurses quarters	No of Staff
Dr’s quarters	No of Staff
Welfare	No of Staff
Dr’s Restaurant	No of Staff
Chairman's office	No of Staff
Director' Office	No of Staff
Deputy Director' Office	No of Staff
Secretary's Office	No of Staff
Matron Office	No of Patients
ICN	No of Patients
Accounts Branch	No of Staff
Establishment Branch	No of Staff
Supplies Branch	No of Staff
Internal Audit Branch	No of Staff
Library	No of Staff
General Stores	No of Staff
Government Audit Branch	No of Staff
Planning Department	No of Staff
Stock Control Management	No of Staff
Note:	
No of Patients	
ETU/OPD/Clinic/Medical checkup - Total No of Patients	
OT/CTOT - Total No of Operations	
Ward-No of Admission X Average length of stay	

C.3 THIRD STEP

- Intermediate Cost Centres

In classifying Intermediate Cost Centres, departments with patients receiving services from several departments are classified as Intermediate Cost Centres (A) and departments that only aid in the activities of the Final Cost Centres, Intermediate Cost Centres (B).

In SJGH 5 departments: three Paying Wards, ICU and OT are classified as Intermediate Cost Centres (A), and 11 departments mainly based on co-medical services such as IDD, X-ray and Laboratory are classified as Intermediate Cost Centres (B) (**Table 4- 7**).

- Absorption of Intermediate Cost Centre B's Costs

Among the departments classified as Intermediate Cost Centres (B), activities related to Laboratory and X-ray are determined in relation to Intermediate Cost Centres (A) and final Cost Centres so the costs are absorbed in accordance with the amount of activity relating to each.

For other departments (with the exception of CSSD, Laundry and Sewing) the number of cases per Cost Centre during 2005 is calculated based on each department's records. Based on the numbers of cases, costs are absorbed to the Final Cost Centres and Intermediate Cost Centres (A).

Services offered by the Laboratory and X-ray units, are widely varied, not only by process but also by materials used. Therefore, if at all possible, it is preferable to calculate the cost of personnel emoluments, material costs and other expenses for each activity separately. In the EBM Study for the moment, only the activities conducted by the Laboratory and the X-ray units are roughly estimated in this manner, allowing for the total costs to be absorbed based on the cost of each activity multiplied by the number of patients from each final Cost Centre.

TABLE 4- 7: ABSORPTION BASE AT INTERMEDIATE COST CENTRE

Intermediate CC(B)	Absorption base (Costcentre-wise)
Pharmacy	No of Issues
X-Ray	No of X-ray Patients × Activity
Path lab	No of Laboratory Patients × Activity
Physiotherapy	No of Physiotherapy Patients
Blood bank	No of Issues
E.C.G./E.E.G	No of ECG/EEG Patients
Endoscopy	No of Endoscopy Patients
Kitchen	No of Diets
C.S.S.D.	OT(41%), Surgical Ward(29%), NICU(12%), CTOT/ICU/LR(18%)

	Information from staff (Recovery & Issue rate)
Laundry	No of Staff
Sewing room	No of Staff

With regard to the method of figuring out the cost of specific activities, at the X-ray unit and Laboratory this was done by adding “The number of staff involved × time” estimated per film for the X-ray unit, and per sample for the Laboratory, so that the personnel cost is the total of the individual services.

TABLE 4- 8: METHOD OF ESTIMATING ACTIVITY

Activity (X-Ray)					
Per Film	Radiographer	Doctor	Nurse	Orderly	Total
X-ray	1person × 5min.	1person × 5min.	-	2person × 5min.	20
CT	1person × 30min.	1person × 30min.	1person × 30min.	1person × 30min.	120
Ultra Sound	-	1person × 15min.	-	1person × 15min.	30
Information from X-ray dep.					
Activity (Path-Lab)					
Per Sample	Lab. Technician	Doctor/Specialist		Orderly	Total
Bio Chemistry	1person × 5.5min.	0.5person × 5.5min.		1person × 5.5min.	13.75
Micro Biology	1person × 5min.	1.5person × 5min.		1person × 5min.	17.5
Haematology	1person × 5.5min.	1person × 5.5min.		1person × 5.5min.	16.5
Histology	1person × 4.5days	2person × 4.5days		1person × 4.5days	84
□ Histology Total = {4person × (7hours/day × 60min × 4.5days)} / (20samples/day × 4.5days)					

- Absorption of Intermediate Cost Centre A’s Costs

With regard to 4 departments (three Paying Wards, and ICU), the number of patients is considered per ward or department, and costs are absorbed to the Final Cost Centre based on this figures. In the case of the Operation Theatre, the activities are roughly estimated by calculating the average time for each operation by specialty. Other department’s costs are then absorbed to the related wards.

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TABLE 4- 9: ABSORPTION BASES OF THE COST CENTRE A'S COSTS

Intermediate CC(A)	Absorption base (Cost centre-wise)
Wards 3,4,5/ICU	No of Patients
Operating Theatre	No of Operations × Average time (Estimation by specialty)
CTOT	Ward18
Labour room	Ward 2 & Ward 9
CIU	Ward19