Activity Based Costing in Hospitals*

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Activity Based Costing (ABC) is a technique developed for strategic management. It analyses the cost of all activities involved in the production processes. This technique is very well suited to calculate cost in a service institution like hospital. It is also useful to determine the costs in each department or activity centre in the hospital and for each activity – test, procedure or intervention.

Improved financial management is a must if hospitals are to survive and flourish providing quality health care.

“…the Indian hospital industry is a sinking one. Government hospitals are in a pathetic state; private hospitals are closing down”.


Cost determination and analysis are not carried out satisfactorily in most hospital. Cost finding is complex. There are direct and indirect costs. Examination of how resources have been utilized to perform an activity is necessary for many purposes:

1. Rate setting (pricing the service)
2. Better management
   - cost consciousness; cost control; cost effectiveness
   - eliminating waste
   - benchmarking
3. User fee and cost recovery
4. Insurance; Medical aid plan
5. Fund allocation (esp., in government sector)
6. Regulation by government
7. Transparency

Rate setting

The main purpose of this presentation is to determine how pricing may be done equitably to meet the true costs.

“The present system of pricings seems to be ad-hoc. Fee levels are set without reference to cost…Service charges are set on the basis of an initial market survey of comparable services in

the private sector. A fee for a chemical pathology test, for example, is set after checking the
prices charged by closely located competitors.”

- The costs of financing of health care,

Cost Consciousness and cost control

Once we know the actual costs (direct and indirect), we can create cost awareness among all
hospital staff. This can lead to better cost monitoring and cost management. Various strategies
can be adopted like

- Decreasing cost of inputs relative to outputs;
- Better utilization of personnel; and
- Changing the technology

“The cost control systems are weak in almost all institutions. Most institutions
did not have information on the costs for different services, such as X-rays and
diagnostic investigations …. An analysis of the costs of various hospital
services will not only help to rationalize the fee structure but will also point out
avenues for cost reduction…. The economies so achieved can be passed on to
the patients.”

“High technology services…. are not charged at their full cost, which would be
prohibitive as relatively smaller number of patients require them. Such services
are therefore cross-subsidized by other users”.

- Peter Berman and M E Khan (1993): paying for India’s Health Care,
New Delhi, Sage Publications.

If we know the elements of cost for various services, we can manage them better, minimizing
waste and controlling costs.

Needlessly expensive inputs and technologies can be avoided by

- substitution by less expensive, but no less efficient, cadres of health personnel;
- questioning the need for the number and extent of diagnostic services requested;
- using less costly, but equally effective technology for investigations and treatment; and
- use of less costly, but no less efficacious, drug regimes.

Hospitals must always be conscious of cost-efficiency and cost-effectiveness.

More efficient: carrying out the service cheaper; less costly with less resources – staff,
materials, money, time.
**More effective:** concern for the results (outcomes) and achievement of the objectives.

**User fee and cost recovery**

There is clamour to introduce user fee everywhere, including government run health facilities. User fee has been in vogue in the voluntary and private hospitals. To do this rationally, we need to know the true costs of the services.

There are many arguments against user fee. The most important is “equity”. Health care services must be accessible and affordable. When charges are made, the very poor will be excluded. Health care services are too important to be left to market mechanisms.

Cost recovery raises many questions:

- What to charge for?
- Whom to charge and whom not charge?
- How to charge?
- How much to charge?

When exemptions are proposed, it is seen that many more people become exempted and exemption fails to reach all those it is intended to reach.

**Insurance**

There is increasing demand to cover health care services by insurance, which is being opened up to the private sector and even transnationals. For fixing the premium for the coverage being provided, it is necessary to know the cost.

Many hospitals have arrangements with industries and business firms to provide health care and health check-ups. These plans can be executed beneficially for both parties if the costs are known.

**Allocation of funds**

To have cost-effective allocation of funds, we need reliable information on alternative interventions.

“Cost-information alone can promote allocative efficiency, as the experience of a Brazilian non-profit maternal and child hospital demonstrates. By estimating costs for ‘cost centres’ and relating them to outputs, the hospital discovered that its paediatric intensive care unit would drain resources from other departments…The decision was made to limit the intensive care unit to newborns”

Regulation by government

Many states have introduced or are considering regulation of hospitals, including fixing ceilings for various services. Because the health profession and health care facilities have not fixed the criteria for charges are being levied (lack of information) of costs, politicians and bureaucrats fixing the charges. They (and their advisors) have no or little idea of the costs involved and are least competent to fix the charges.

Factors influencing hospital costs

- **Case mix**: The more severe or complex cases increase the cost per patient.
- **Choice of technology**
- **Volume of services**: Higher volumes mean that the fixed costs are spread out over a large number of units of output, leading to lower average costs.
- **Activity and Occupancy levels**: Number of patients treated; be occupancy; length of stay.
- **Medical practice style**: Differences in response to particular medical conditions affect cost-choice of drugs, etc.
- **Quality of care provided**
- **Efficiency**: Inputs versus output (and outcome); wastage; higher productivity. With an efficient management system, human and material resources are deployed economically.
- **Training programmes**: research; health and patient education.
- **Competition**: Competition between hospitals leads to more facilities and conveniences but does not usually lead to lower costs.

Cost centres

A cost centre is a functional unit which provides “services” and incurs “costs”. Many activities are incorporated in each cost centre (which is also a revenue centre).

There are various ways of classifying cost centres:

1) **Direct Patient Care cost centres**
   - Outpatients
   - Emergency services
   - Inpatient wards
     - male medical; male surgical
     - female medical, female surgical
     - paediatric (medical; surgical)
     - maternity; gynaecology
     - post-operative
     - intensive care’ coronary care
     - special (private; semi-private; speciality)
   - Special clinics (diabetic, allergy, cardiology, well-baby, antenatal, postnatal, etc.)
   - Operation theatre (?)
2) Ancillary services

- Clinical laboratory
- Radiology; ultrasonography; CT scanning
- Pharmacy

These centres are often called “cash cows”, because they usually generate larger revenues, compared to the cost. They often offset deficits elsewhere. Hospitals charge “what the market allows”. Sometimes, the number of investigations done are not medically “necessary” but may be medically “justifiable”.

3) Overhead cost centres

The cost centres do not produce patient services directly but give inputs into patient services. Among them are

- Administration
  - general
  - plant and machinery; building; housekeeping; premises
  - personnel and materials management
- Accounting
- Dietary
- Laundry
- Mortuary
- Transport
- Security

The overheads are allocated to the other cost centres on a proportionate basis. Even the ancillary service centres costs are allocated to the patient care centres, which are then called the final cost centres.

Training

Many hospitals have training programmes

- Nursing
- Laboratory technicians
- Radiographers
- Dieticians
- Others

The costs of these programmes are calculated and then apportioned.

Costs can be
**Direct costs**: costs of inputs which can be traced clearly to a particular cost centre, e.g., laboratory reagents; X-ray films; staff who spend their whole time working in a single cost centre.

**Shared costs**: costs of items that are shared among more than one cost centre, e.g., electricity; housekeeping materials; staff who contribute to the output of a number of cost centres.

Allocation of shared costs can be done, though not exactly. Do not expect 100% accuracy.

**Administration**: All cost centres require the support of administrative. Work out the share based on proportion of staff time, direct costs or other criteria. Use the same criteria for all cost centres.

**Staff**: When staff are involved in different activities, the amount of time spent on each activity can be considered. Draw a schedule of their activities during a typical week. (what really happened and not what was expected).

**Supplies**: Volume of different items used for each activity (including wastage, if any).

**Housekeeping**: share can be worked out based on amount of space (including corridors and waiting area) used.

**Costing steps**

- Identify the resources (direct and shared) used to produce the service being costed
- Estimate the quantity of each input used
- Assign monetary values to each input (including shared inputs and overheads)
- Calculate the total cost of the input.
- Allocate the costs to activities in which they are used.

**Capital (development) cost:**

Establishment productive capacity. These costs are necessarily incurred irrespective of scale of activity. The capital costs should be apportioned between the life yeas of the asset and between the cost centres. Apportioning between the life years is usually done by the straight line depreciation method (spread evenly over the useful life span of the item” total cost – expected years of life).

- Buildings : 20-25 years (depending on type of building)
- Equipment : 5-10 years (depending on the nature of equipment)
- Furniture : 10-15 years (wooden; steel)
- Vehicles : 5 years.

**Building**

Measure the area of each room, including corridors and waiting areas and apportion cost.
Equipment

Make an inventory of all equipment, according to the main activities for which the equipment is used or shared. Equipment are of various kinds:

**Imaging**: X-ray, ultrasound; CT scanner, etc
**Surgical**: Operation tables, lights; anaesthesia apparatus, diathermy, etc.
**Intensive Care**: monitors, defibrillators, ventilators, etc.
**Laboratory**: auto-analysers, centrifuges; microscopes; cell counters, etc.

Equipment cost includes initial purchase cost, post-warranty costs, upgradation, support contracts, repairs and maintenance. The cost of ‘supplies’ would be additional. In the case of sophisticated equipment, the cost of training personnel has to be included, unless it is borne by the manufacturer/supplier.

Furniture

Make an inventory of the furniture present in each room in the facility.

If land has been obtained on lease the cost of the lease also has to be considered.

There can be investment in “human capital”, where training is given to the staff. But this is not often taken as “capital” but included in recurring (operating) costs.

Recurring (operating) costs

1. **Personnel**: Make list of all personnel and calculate the cost for each staff member.
   
   **Full cost**: take home pay + fringe benefits (gross emoluments) + employer’s contribution
   Salaries and allowances

   Calculate staff allocation on a ‘typical shift’. How much time do they spend on each activity? Calculate unit cost per minute / hour.

2. **Drugs and Medical supplies**

   Full financial cost of drugs and supplies consumed by each cost centre. Include drugs and supplies lost or wasted.

3. **Vehicle operating and maintenance**

   Fuel, lubricants, insurance, registration, tyres, batteries, spare parts and personnel.
4 Building recurrent costs

Lighting, water, insurance, materials for cleaning, painting, maintenance and repairs, plumbing

5 Equipment recurring costs

Refrigeration, sterilization, maintenance, upgradation.

6 In-service training and staff development

Actual expenditure: average of 3 years.

7 Administration, accounting, house – keeping, etc.

One of three methods can be used for allocation;

i. Patients contacts in the cost centre
ii. Space occupied by the cost centre
iii. Number of staff (full-time equivalent) working in the cost centre.

Some examples of ABC

The method of activity based cost management is to link up all activities that need to be performed to provide a service. The cost of each input (direct and indirect) is calculated and then totaled up to give the total cost.

Pharmacy
(costing a drug dispensed)

When drugs are dispensed in hospitals, pricing can be done by adding a certain margin to the cost. A useful formula would be

Purchase cost x 140% (a suggestion only): price at which the medicine is made available to the patient.

Notes Hospitals are offered “discounts” and “incentives”. The actual cost will be less than the cost shown in the bill, eg., 3 bottles of IV fluids are given free when 10 bottles are purchased. The benefits must be shared between the patient and the hospital.

The ultimate price should not exceed the maximum retail price. The extra 40% should cover all overheads and losses due to ‘spoiling’ of drugs, breakages and expiry date.

Operation:
(for a single operation)
In a study on cost-effectiveness of extraperitoneal laparoscopic inguinal hernia, conducted in University Hospital, Utrecht, The Netherlands, Mike S.L. Liem et al listed the following costs of main resources:

- Pre-operative screening (including ECG and X-ray chest)
- Anaesthesia: type of anaesthesia and anaesthetics used.
- Operating room
- Operation time
- Personnel during operation (medical, nursing, others)
- Sterilization and maintenance
- Drugs and supplies
- Hospital days
- Post-operative medical care
  - follow-up visits
  - pain medication
- Outpatient visits

To the above must be added proportionate cost of overheads.

**Clinical laboratory**
(costing a single test)

Staff time
- technician; helper
- supervisor/specialist – Pathologist, Microbiologist, Biochemist.

Laboratory time

Training (in-service or external)
Equipment, eg., autonanalyser – apportion
Reagents (include calibration, wastage, etc)
Other chemicals, washing, etc.
Glassware, pipettes, etc (apportion)
Sample collection
Overheads: housekeeping; utilities
Forms/requisitionsregisters/computer time
Administration – apportion
Reporting.

**Inpatient ward**
(for a single patient)

Admitting service

Staff time: Consultations: procedures
  Doctor, nurse, aide, other staff
Supervision

Supplies: Drugs, oxygen, ventilator, etc.
Dressing; health accessories

Monitoring

Investigations
Overhead: housekeeping, utilities: apportion.
Administration – apportion.
Reports: Medical; nursing.

By costing each activity, we can determine the real cost of each activity, test, procedure or service of any kind, which can be used for rate setting and other decision making. We will need that information; the public will demand it.

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