

# From the desk of Editors-in-Chief

Healthcare sector in India is undergoing a paradigm shift in terms of technology dominance, changing disease pattern, changing urban rural health scenario and growing wrath of lifestyle diseases. The changing geopolitical scenario and the upsurge of chronic ailments is redefining the delivery of healthcare in the world. There are also issues of medical errors and adverse events. It has been estimated that there are 5.2 million injuries each year due to medical errors and adverse events. The local health sector is metamorphosing, keeping in sync with the global needs and clientele demand. Thus, the health sector is more global than ever. New trends and developments in health sector have to be customised to the local health needs of the populace. There are no set models to be replicated in health sector which adds up to the challenge of being constantly innovative and vibrant.

It becomes imperative to keep abreast with the latest in the field of healthcare. The Indian healthcare sector is now poised for rapid growth more than ever before and this offers great entrepreneurial opportunities. Quality, accreditation, healthcare technology, disruptive innovation, entrepreneurship, medical insurance, public private partnership, e-health chaupals, emergency response system, etc. are the buzz words in the health sector. India has a huge pool of untapped talent and resources. Health infrastructure is striding ahead at greater pace than ever. India is a great healthcare tourism destination for the cost involved, and the quality of services available is world class for a globally ageing population coupled with increasing lifestyle-related ailments.

Innovation and health entrepreneurship customized to the local needs which are going to be the order of the day. It is extremely important that successful innovations are given the right forum so that they can be of great assistance to the health sector professionals. Entrepreneurship in healthcare is an extremely challenging venture and such efforts should be suitably supported by scientific research and knowledge. This research and knowledge will also help various venture capitalists and angel investors to foresee the trends for their investment in new projects. It is only through due recognition of successful initiatives in the areas of health, that healthcare for the masses will be affordable and accessible.

It is extremely satisfying to note that research in healthcare and hospital administration has gained momentum. It is mandatory that suitable areas of research are identified and pursued vigorously so as to get time bound results. It is unfortunate that, at times, research work does not translate into meaningful scientific papers. The research outcomes need to be disseminated to the environment for sharing and application. This synergy of research in hospital and healthcare administration translating into deliverable application for the community becomes imperative. It was felt need that a scientific body with analytical minds get-together and create a bank of knowledge for healthy interaction and early dissemination of the scientific work in the area of hospital and healthcare administration. Research Foundation for Hospital and Healthcare Administration (RFHHA) was conceived a couple of years ago to provide the much needed impetus in research in hospital and healthcare administration.

This journal encompasses wide range of contemporary issues, like patient safety, legal and ethical issues, clientele satisfaction, healthcare financing, costing studies, case reports, recent advances and other topics.

To address the felt need of creating a knowledge bank related to the latest updates and trends in healthcare sector, a contemporary Journal IJRFHHA was conceptualized. The journal aims to reach out to various stakeholders in healthcare industry and provide a facilitating platform for knowledge sharing and research advancements. The journal will also act as a beacon to encourage young researchers in the field of health and hospital administration.

We are sanguine that the journal will be able to establish itself as a publication of global standard in areas of hospital and healthcare provisioning.

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# Guest Editorial

## Creativity, Innovation and Entrepreneurship...A New Prescription for Healthcare

We are living through what is arguably the most challenging time for the healthcare industry. Globally, healthcare appears to be on a collision course with patient needs and economic reality. No one is happy with the current system and the combination of rising costs, poor access, inequitable care and diminishing quality and safety has created anxiety and frustration for all. Decades of interventions have failed to improve the situation; if anything, things have become worse. Current approaches tend to focus on a single issue or problem—the price of drugs, rising numbers without medical aids, provider incentives to overtreat but an overarching solution has remained elusive.



Clearly, the time has come for a radical reconsideration of our approach, one based on the trajectory of well-functioning industries. The healthcare status quo is poised to be revolutionized by two forces—technology and consumerism—and the purpose of my column is to help you to get a realistic grasp on, and understand and recognize the opportunities and disruptive influences of exponentially growing technologies and converging fields within health and healthcare. More specifically, how rapidly developing technologies, such as low cost genomic sequencing, artificial intelligence, 3D printing, telemedicine, robotics, 24/7 body wearable monitors, smart pills, stem cells, synthetic biology, gene therapy, mobile phone apps and crowd sourced healthdata, are bound to affect the future of health and healthcare. So, whether you are a policymaker, payer, provider or patient, you need to get ready for a world of healthcare abundance....but only if we change our prescription!

The fundamental problem with health systems in general is that health outcomes which are not commensurate with what we spend, with our human resource capacity and capability and with current technology advancements. In short, we get out much less than we put in and this performance potential gap is inconceivable in a well-functioning market. The solution for health is, therefore, in creating value or put very simply, getting more out than we put it! As simple and obvious as this seems to be, creating value has not been the central goal, more especially, of those tasked with managing healthcare. Current approaches to health management tend to focus on maintaining the status quo or usually making unnoticeable incremental efficiency improvements (if we are lucky!)....which in effect amounts to a loss of value given what this costs us and what is available to us.

So, how does one create value in healthcare? Simple. By using the same value, creating processes and activities that Albert Einstein, Walt Disney, Steve Jobs, Richard Branson, Larry Page and a host of others used to ensure that their organizations and industries performed close to their maximal potential. They were creative, innovative and entrepreneurial and they encouraged, enhanced and enabled their teams and organizations to do the same. These are not the particular endowment of a lucky few people or organizations but are the result of skills and abilities that can be learnt by anyone. They are sorely needed in healthcare, if we are to come close to fulfilling the potential of the system as a whole and achieve an era of healthcare abundance!

Creativity is our ability to generate new and useful ideas that can be put to work in our personal or business lives. It is a specific and practical technique (it is not intelligence!) that can be learnt and critical in allowing us to rethink the way we see things as well as help us to generate the ideas and creative solutions that we need to solve the challenges that we face daily either as health policymakers, managers, care providers or patients. Amazingly, none of us are taught this and we are never assessed for this when we are being evaluated for education or job opportunities. I think this is a critical caveat in our education and training system (not unique to India) but as important as this competence is, the real value creation is still in the mind of an individual and it needs to be translated into something tangible, useful and useable...in this case to improve health and healthcare delivery.

This ability to translate a novel idea into a product, service, process or business model which is actionable and has value to the user is known as innovation. This includes making available existing products, services and processes to those who previously had no access to these. The latter is particularly relevant for healthcare in developing country contexts as the key to improving access and equity, and reducing costs will depend on leveraging existing exponential and converging technologies (like cell phone technology and genomics,) which are set to fuel the medical revolution. But, incremental

process innovations based on those of industry leaders in other sectors (e.g. on Toyota's production systems or Wal-Mart's supply chain management) are also extremely important to achieve efficiencies and should occur in parallel. These could be clinical process innovations or innovations in all the secondary or supporting activities associated with the delivery of care. Once again the ability to innovate can be learnt but is stark in its absence from programs aimed at training health sector professionals and managers. However, although all of these innovations and the ability to innovate are inherently valuable, they are meaningless if not made available to the masses.

Entrepreneurship is the process of taking innovations to the market or applying them widely within organizations, irrespective of the constraints one faces. Entrepreneurs are not born...they are individuals who have mastered the practice (by learning!) of being innovative, proactive adept at managing risk and possess the ability to get things done despite the contexts they find themselves within. We desperately need this caliber of individuals to effect change within health organizations and within the system as a whole. Instead, we are saddled with administrators and managers....a far cry from what we need to transform the system.

So, I guess what I am saying is that we have reached the tipping point in healthcare and now, more than ever, we need all players, especially leaders to adopt and propound creativity, innovation and entrepreneurial thinking and behavior as a major catalyst to effect positive change in our health and in healthcare delivery. We need people who can create value at all levels...mind, matter and market! Clearly for healthcare to change, we can start by training those responsible for delivering healthcare and those overseeing the delivery of care to be creative, innovative and entrepreneurial.

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# Determination of the Cost of Training of Undergraduate Medical (MBBS) Student at All India Institute of Medical Sciences, New Delhi, India

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## INTRODUCTION

All India Institute of Medical Sciences (AIIMS), New Delhi, is a unique institution and one its kind in India. It was established in the year 1956 by an Act of Parliament of India as an autonomous institute of national importance. The act mandates that 'the Institute shall be a body corporate by the name aforesaid having perpetual succession and a common seal, with power to acquire, have and dispose-of property, both movable and immovable, and to contract, and shall by the said name sue and be sued'.

The objectives<sup>1</sup> of the institute are to develop patterns of teaching in undergraduate and postgraduate medical education in all the branches of medicine so as to demonstrate highest standards of medical education in India. Accordingly, the Institute focuses on the trinity of objectives of training, research and patient care, with training being the foremost of all. It is this trinity of mission that guides all the endeavors undertaken in the institute. The primary objectives of the institute are teaching and research. Since these cannot exist

without patient care, the patient care exists as means to these objectives. The institute runs a number of training courses in medical, paramedical and nursing fields and trains a vast pool of experts who become part of the healthcare personnel resource of the country.

Undergraduate training has, since the very beginning, received special attention in the Institute. The undergraduate program Bachelor of Medicine and Bachelor of Surgery (MBBS) has an intake of 50 students out of which five students come as sponsored candidates from foreign countries.

## Need for the Study

The conduct of the undergraduate course at AIIMS comes for a cost. Training, being first of the trinity, takes precedence and as a result the training infrastructure has been created with lot of care and eye for detail. Resources are utilized in maintaining these facilities, paying the faculty and staff and maintaining the boarding and lodging services for students. These resource-limited times demand costconsciousness in all endeavors and, therefore, cost awareness and subsequent cost containment has become a compelling reality. The instant study is relevant in this context. The precise costing has the potential to influence the decision making regarding the course conduct, content and the outcomes. It can transform our understanding of the costs of various training processes and contents. This study of costing of undergraduate program (MBBS course) at AIIMS will augment a range of activities of funding, budgeting and accounting for the conduct of the MBBS course.

## REVIEW OF LITERATURE

The subject of cost of instruction is sometimes overlooked in the broader context of discussions about affordability, cost, price, and the economics and finance of higher education.<sup>2</sup> There is, however, a distinct though relatively small knowledge base of literature and research about cost of instruction.

There are several characteristics of higher education institutions. These are as follows:

- The accounting systems of large higher education institutions may produce a plethora of periodic reports, like the budgets and related financial documents which

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are likely to be understood only by budgeting and accounting officers but not by senior academic officials.

- The outputs of faculty—the key employees—are interrelated and not clearly separable from each other. There are no obvious ways to distinguish between faculty research, teaching and professional service.
- The distinctions between inputs and outputs and producers and consumers may be equally blurred.
- The costs and revenues of higher education institutions may be integrally related and certain costs may not be incurred unless they were to be explicitly funded from outside sources. For example, universities carry out certain research projects only if independently funded.
- The capacity constraints of higher education institutions are not clearly discernable. Faculty, e.g. does not work a standard number of hours per week and hence can undertake additional assignments without any readily apparent reduction in the time devoted to other assignments. Similarly, new programs and activities can be added without any obvious sacrifice in the quantity or quality of existing ones. At the same time, capacity costs are proportionately high. Classrooms, laboratories and dormitories are subject to long planning, approval and construction processes and it often takes at least two or more years before new faculty positions can be approved and filled.

### Costing Studies of Undergraduate Medical Education

In case of training of doctors, the costs assume accentuated importance. The reasons for this are two fold. Firstly, there has been general concern about the rising costs of medical education, especially at the undergraduate level. Secondly, the costs have direct impact on the quality of medical education and, therefore, the quality of future doctors.

These concerns are not new. In 1929, WH Hattie<sup>3</sup> expressed that the cost of medical education has already become very great. More recently in the year 1986, MT Rabkin<sup>4</sup>, Professor of Medicine at Harvard Medical School commented about reducing the cost of medical education. He argued that for ‘cost effectiveness in medical education—we have only begun to make serious inquiry, and there is no obvious solution in the wings.’

Jean D Gray and John Ruedy, in a paper titled ‘Undergraduate and Postgraduate Medical Education in Canada’<sup>5</sup> presented at the Trilateral Physician Workforce Conference held in Washington in November, 1996, stated that until recently, costs of medical education have been very reasonable in Canada. However, since the early 1990s, tuition fees have risen, the costs of credentialing and examinations have increased, malpractice insurance and licensing fees have become higher and obtaining an appropriate residency training position has become more costly.

William J Bicknell, Andrew C Beggs and Phi Van Tham published a landmark article ‘Determining the Full Costs of Medical Education in Vietnam: Results, Policy Implications and a Generalizable Model’<sup>6</sup> in *Health Policy and Planning* (2001). They described the methodology for computing total costs of teaching undergraduate medical students at Thai Binh Medical School, Vietnam. The model for computation of costs was a full-cost model. The study also considers faculty and staff contact hours as the primary cost driver at Thai Binh Medical School. This was done using a top-down costing approach, i.e. the fund provisions were examined and the allocations were done based upon ‘6-year medical student equivalents’. This 6-year medical student equivalents was a novel concept and was developed to isolate the training of undergraduate medical students from all other trainings so that costs can be isolated and computed.

Several such studies have also been carried out across the globe. The notable ones among these are Vimolket T (2003)<sup>7</sup>, Morrison G (2005)<sup>8</sup>, Jones and Korn (1997)<sup>9</sup>. Three closely related reports from Australia (Andrew, 1976<sup>10</sup>; Andrew and Nehrmann, 1977<sup>11</sup>) and the US (Mulhausen et al 1989<sup>12</sup>) consider the cost impact of medical student teaching on the overall costs of teaching hospitals.

The overarching feature of the methodologies in these studies was an emphasis on determining, through analysis of the curriculum, the proportion of faculty hours dedicated to teaching medical students. One study expressly stated that ‘all data were based on faculty contact hours, the primary driver of cost’ (Rein et al 1997).<sup>13</sup>

In the Indian context, the earliest efforts to cost undergraduate medical education were made by Prabha Ramalingaswami<sup>14</sup> of Jawaharlal Nehru University, New Delhi, in the year 1984. This was published in the *Indian Journal of Medical Education* (May-Aug 1984). In this study, carried out in 14 medical colleges across India, only recurring costs of the medical colleges were taken into account while working out the costs per student. The study methodology comprised of record reviews, interviews with the faculty in one medical college to develop assumptions about the teaching. A questionnaire was also used. The institutional costs (capital and recurring) were analyzed separately.

The Tata Consultancy Services, New Delhi (TCS), carried out a study<sup>15</sup> in 1987 at AIIMS to determine the costs of services rendered by the institute to public and to highlight any department or service consuming resources heavily in the short or long run. The study worked out the unit costs of various services. It also proposed a costing model for implementation at the institute. The study also computed the costs of teaching undergraduate and postgraduate students.

The costs of one student was worked out as ₹ 1,06,570/- annually.

In 2000, Lt Col Punit Yadav carried out a study (unpublished dissertation) to compute the costs of training of undergraduate student at Graduate Wing of Armed Forces Medical College, Pune, India. A mix of traditional and activity-based costing methodology was used.<sup>16</sup> The study computed the costs of one undergraduate student as ₹ 10,12,437.24.

Common theme in the literature is the difficulty in determining how much of the work in the clinical faculty can reasonably be ascribed to the medical education function (Goodwin, Gleason and Kontos 1997<sup>17</sup>; Rein et al 1997 and also Prabha Ramalingaswami 1984). The problem is that much of the clinical work that is performed at a teaching hospital serves both a patient care function and an educational function. Rein et al express it eloquently: 'Although it is, indeed, a wonderful aspect of medical education that both can be accomplished at the same time, for purposes of accounting it is necessary to try to assign the fraction of the time attributable to each endeavor separately'. Clearly, the most reasonable way to make this type of determination is to engage the teaching staff in a conversation about their work. They are the best judges of what work they perform on a day-to-day basis. Also, if the staff is involved in developing the assumptions underlying the model, they will be much more likely to accept the results of such a costing study.

## METHODOLOGY

The study was carried out from July 2007 to June 2008 at the AIIMS, New Delhi. The study is based upon classifying costs, identifying cost centers and tracing the costs to the MBBS training. Cost allocation to the relevant cost center was done by apportioning the costs in the proportion of MBBS students.

In the first stage, the inputs collected were curriculum of the MBBS course, detailed information about the training activities concerning MBBS students, weekly schedule of training programs and such similar information. The information thus obtained was compiled, tabulated and analyzed. Further, the information about the norms for the faculty and the residents as relevant to the training of MBBS graduates were collected and tabulated. The later was done to obtain the minimum faculty and residents requirements for the conduct of MBBS course at AIIMS. The information about each department, center and facility was computed to obtain the direct, indirect and the total costs incurred toward the MBBS training for a student. In the second stage, the costs information was utilized to carryout the traditional costing by tracing the costs to the cost centers and finding out the cost drivers. Time driven activity-based costing was

done using the same information and then a comparison was drawn to estimate the realistic costs incurred toward the MBBS graduate in AIIMS. In the third stage, an attempt was made to formulate a costing model for computing the costs incurred in training of a MBBS student.

Costing has been done for the entire duration of the course, i.e. from the day, the MBBS course begins up till the completion of compulsory internship. The study included only the costs incurred by the institute on education and other related activities.

The manner in which costs for various resources was considered is given in Table 1.

## Data Collection, Tabulation and Computation

The cost information was collected from each department and facilities. Only the departments as per the norms of Academic Committee of AIIMS were included. Data was collected by inspection and review of records, perusal of policies and rules/regulations of AIIMS and various other government departments and ministries and inputs from key informants.

Key-informants from the non-teaching departments/sections were the heads of the respective department/section. From teaching departments, the faculty in-charge for teaching of undergraduate MBBS students was identified. In many cases, other faculty members whose inputs were felt necessary were also contacted. These faculty members were identified in consultation with the respective heads of the department and the faculty in-charge undergraduate teaching.

Data was tabulated and compiled using OpenOffice Calc. All costs were annualized and then utilized for computation of the results. Cost computation was done using two methods. First, using traditional costing method, second by using time driven activity-based costing<sup>20</sup> method.

A few exclusions were identified *ab initio*. These are as follows:

- It has been assumed that all students progress to next semester without failures.
- Air conditioning: Eighty percent of all floor space has been counted as under air conditioning.
- Personal costs like costs toward food, books, stationery, etc. excluded.
- Costs on account of delay in completion of the course excluded.
- Only the significant costs have been included, others have been excluded, e.g. the value of fee charged from MBBS students has been excluded being relatively small amount.
- The costs toward Employee Health Scheme were excluded since there are (a) large variety of beneficiaries including serving, retired staff (b) no pattern can be

**Table 1:** Manner of consideration of resources

Resource	Manner of consideration for costing
Land	<ul style="list-style-type: none"> <li>The value of the land has been ignored.</li> <li>If included, would unduly influence the total costs of training making it a biased observation.</li> </ul>
Buildings	<ul style="list-style-type: none"> <li>The rental rate of Directorate of Estates, Ministry of Urban Development Government of India has been used for costing as this is the basis for cost recovery from the users.</li> </ul>
Equipment, furniture and fixtures	<ul style="list-style-type: none"> <li>The replacement values, i.e. the current values have been taken in to consideration for computing the costs.</li> <li>Where only historical costs were available, these were adjusted for the year 2007 using the Linked All India (Urban Non-Manual Employees) Consumer Price Index.<sup>18</sup> The index for 2007 is 503 on base as 100 for the year 1984 and 1985.</li> </ul>
Personnel	<ul style="list-style-type: none"> <li>The 'Costs to the company' data, i.e. total costs to the institute were computed including the salaries, allowances, perks and other facilities computed at mid-point of the pay scale for the year 2007.</li> <li>In case of personal staff like principal private secretaries, private secretaries, personal assistants and orderlies/peons, the costs have been built-in into the costs incurred on the categories of senior staff members who are entitled for using the services of these staff.</li> </ul>
Library	<ul style="list-style-type: none"> <li>The average expenditure per year was computed using available data on 'plan' and 'non-plan' allocations of past 3-years.</li> </ul>
Supplies/ consumables	<ul style="list-style-type: none"> <li>The supplies and consumables are procured by the respective departments and facilities using the funds from the non-plan head of the budget allocated to each department/facility.</li> <li>The average of the non-plan outlay of past three financial years has been taken toward all the consumables and supplies of respective department. These costs are then apportioned appropriately.</li> </ul>
Utilities	<ul style="list-style-type: none"> <li>Electricity—average actual expenditure on electricity.</li> <li>Water—a consumption of 200 liter per person<sup>19</sup> has been taken for water usage and costs have been calculated. Rates of Delhi Jal Board have been used.</li> <li>Air conditioning—installation costs have been included and distributed over the estimated life of the AC plant. The maintenance costs have been taken at 5% of installation costs annually.</li> </ul>
Expenses	<ul style="list-style-type: none"> <li>This includes stipend to interns and scholarships to meritorious MBBS students.</li> <li>The actual expenditure has been included.</li> </ul>

deciphered in the expenditure as it dependent largely upon the type of illnesses treated, (c) the costs are spread over several cost centers, like pharmacy, wards, hospital stores, etc. and (d) no separate accounting is done for serving and retired staff.

- Costs of general administration.

## Costing

The study has been carried out with the objective of finding out the costs incurred on training of undergraduate MBBS student at AIIMS by using two distinct approaches to costing namely—traditional costing and time driven activity-based costing. The summary of the costs worked out by these two methods is given below:

### Traditional Costing Steps

- Curriculum analysis
- Determine the 'MBBS student equivalent'.
- Costs computation, apportionment and assignment
- Computation of costs of one MBBS student at AIIMS.

The curriculum analysis of MBBS course and other courses in AIIMS was carried out to ascertain the quantum of resources consumed by the MBBS course. Since the resource use is mixed and no separate accounting is done for resources consumed by MBBS, the quantum consumed by MBBS students was ascertained by determining 'MBBS Student Equivalent'. To explain the concept, e.g. if one

student of MBBS course consumes 'one unit' of a given resource, how much of the resource would be required to train the students other than MBBS students?

In order to get this equivalent, discussion were held with the Dean (academics), Sub-dean (academic) and the other key-informants at the institute and the estimation is based upon their judgments. The postgraduate and postdoctoral students have been taken at par with each other since the resource consumption is comparable. The annual number of admission of MBBS students is 50 and postgraduate and postdoctoral students are 291. As far as other undergraduate courses (like nursing and paramedical) are concerned, these do not overlap significantly with MBBS course in terms of resource consumption and, therefore, have been excluded from consideration.

It has been determined that training of a postgraduate student consumes 2.5 times the resources as compared to MBBS student annually. Utilizing this equivalent, a weighted percentage of the MBBS students has been calculated. As Table 2 indicates, in terms of medical school resource consumption, MBBS students account for about 11.2% of all the students at AIIMS.

The summary of the costs worked out by the traditional costing method is given in Table 3.

The annual direct and indirect costs per student come to ₹ 17.47 lacs and ₹ 13.84 lacs respectively. The total per student annual and per course costs is ₹ 31.31 lacs and ₹ 172.20 lacs respectively.

## Determination of the Cost of Training of Undergraduate Medical (MBBS) Student at All India Institute of Medical Sciences

**Table 2:** MBBS student equivalent computation

S. no.	Course	No. of students	Duration of course	Equivalents	Total equivalents	% in equivalent terms
1.	MBBS	50	5.5 years	1	$1 \times 5.5 \times 50 = 275$	11.2%
2.	PG courses	291	3.0 years	2.5	$2.5 \times 3 \times 291 = 2183$	88.8%
				Total	2458	100 %

**Table 3:** Summary of costs by traditional costing

S. no.	Resource	Annual per batch costs (₹ lacs)		Cost assignment method
		Direct	Indirect	
1.	Personnel—faculty	357		Apportioned
2.	Personnel—NTS		589	Traced
3.	Hospital costs	345		Apportioned
4.	Material—buildings		10.09	Apportioned
5.	Material—furniture		4.44	Apportioned
6.	Material—utilities		59.17	Apportioned
7.	Material—equipment	131.95		Traced
8.	Material—library	4.80		Apportioned
9.	Material—transport		3.64	Traced
10.	Material—acad Office		0.55	Traced
11.	Material—CMET		1.32	Traced
12.	Money—non-plan allocation		24.19	Apportioned
13.	Money—stipend	34.29		Traced
14.	Money—scholarships	0.513		Traced
Annual costs for one batch of 50 students		873.55	692.40	
Annual per student costs		17.47	13.84	
Per student per year cost		31.31		
Total costs of MBBS course		172.20		

NTS—nonteaching staff

**Table 4:** Summary of costs as per TD-ABC for the entire duration (5.5 years) of MBBS course

S. no.	Resource	Costing method	Unit cost (₹)	Usage time (hours)	Total cost (₹)
1.	Personnel—faculty	TD-ABC	-	-	2047089
	Personnel—NTS \$	TD-ABC	-	-	5859856
2.	Material—hospital	TD-ABC	128416.21	3150 <sup>#</sup>	404511061.5
3.	Material—institute buildings	TD-ABC	3495.54	6253	21857611.62
4.	Material—hostel <sup>^^</sup>	Used as such	70200	-	386100.00
5.	Material—furniture	TD-ABC	1652.44	6253	10332707.32
6.	Material—utilities	TD-ABC	2567.48	6253	15416208.73
7.	Material—equipment	TD-ABC	-	-	11162904.17
8.	Material—library <sup>^^</sup>	Used as such	479000	-	2640000.00
9.	Material—transport <sup>^^</sup>	Used as such	364000	-	2002000.00
10.	Material—acad Office <sup>^^</sup>	Used as such	55000	-	302500.00
11.	Material—CMET <sup>^^</sup>	Used as such	132000	-	726000.00
12.	Money—non-plan fund <sup>^^</sup>	Used as such	2419000	-	13304500.00
13.	Money—stipend	Used as such	-	-	3429000.00
14.	Money—scholarships	Used as such	-	-	51250.00
Total costs for one batch					494028788.34

<sup>#</sup>: The hours of training in hospital worked out from the teaching program; \$: Nonteaching staff; ^^: Annual costs worked out and used as such in proportion to the MBBS Student Equivalent, since it is not feasible to determine consumed capacity of these resources

### Time Driven Activity-based Costing

The time driven activity-based costing (TD-ABC) methodology steps are as follows:

1. The unit costs of supplying capacity, i.e. the resources
2. The consumption of capacity (unit times) by the activities carried out in the training of MBBS students.

The costs using TD-ABC method are as in Table 4.

Total costs for one batch of 50 students for the entire course are ₹ 4940.28 lacs and per student costs are ₹ 98.80 lacs per course.

### Costing Model for Costing Medical Education

In an institute of the nature and stature like AIIMS, invariably the research and patient care would be intermingled with training. An institute at the tertiary level and higher, the training at undergraduate level may also get influenced by other activities that would invariably happen within the same environment. As a result, the undergraduate students also benefit from learning. In such institutions, it would be difficult to ascertain the costs incurred toward a particular course. Therefore, the



following approach to costing at undergraduate students' level is proposed.

- Firstly, all resources that are utilized for training for a course be isolated from the overall resources of the institute. Care has to be exercised that the research and service elements are suitable excluded. The unit costs of each of the resource then to be worked out.
- Secondly, the curriculum is to be closely examined for working out the time duration of training in each subject/department. The time spent in support and supervision activities (e.g. academic section, etc.) should be suitably worked out.
- The total costs of consumption of the resources can be worked out by multiplying the unit costs with the time duration of consumption of each resource.
- Certain resources which are not amenable to unit costing in terms of time (like money spent on scholarships, etc.) should be accounted on annual basis and assigned to costs objects as such.
- For resources where segregation is not feasible (such as library), determining student equivalent for the course being costed would provide estimated resource consumption. This proportion then be used for computations.

## CONCLUSION

The cost per student worked out by the two methods for one student for the entire duration of the course is shown in Table 5 below.

**Table 5:** Comparison of two costing methods

<i>Traditional costing (₹ lacs)</i>	<i>Time driven activity-based costing (₹ lacs)</i>
172.20 lacs	98.80 lacs

The costing methods take into account all the resources. The costs of these resources are fully attributed to the cost objects (MBBS course in the study) in traditional costing irrespective of the utilization of the resource toward the cost object. In effect, traditional costing reflects resource costs as these resources are provided and maintained irrespective of consumption.

Similarly, the time driven activity-based costing model also accounts for all the resources consumed toward training. In this method, however, the consumption of resources is considered and costed. When the resource consumption is examined in terms of hours, it generates information about unit costs and unit times. Therefore, the difference in the two methods of costing will show the idle capacity. As is evident from the two methodologies in this study, the two methods lead to different results. This is because of the way these

two methods handle the costs. The difference is really in the indirect costs which have been measured to be substantially low in activity-based costing method.

The academic courses in an institute are designed around a set of norms for staffing, space and other requisite infrastructure. These also define the minimum acceptable level below which a given course of instruction would not be held at all. The time driven activity-based costing focuses on consumed resources. While the traditional costing method focuses on the provisioned resources. Since all provisioned resources could never be used at all times; the costs computed by TD-ABC method will always be lower than the traditional costing method. It may also be a pointer to consider framing of more realistic norms.

The study computed costs incurred on MBBS students at AIIMS during the year 2007. The current costs are likely to be higher.

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# Quality Assurance Program in Radiodiagnosis in a Tertiary Care Hospital in India

Pankaj Arora

## ABSTRACT

**Context:** The specialty of radiodiagnosis has been revolutionized by the advent of technology. This has put additional onus on the practitioners to maintain strict quality control to improve efficiency, lower exposure as well as cost.

**Aims:** The aim of the study is to determine quality assurance program in radiodiagnosis in order to identify the gaps and possible avenues of improvement.

**Settings and design:** The cross-sectional study was conducted in a tertiary care hospital in India in the second half of calendar year 2008.

**Materials and methods:** The department did not have a defined and documented quality assurance program. Hence, the factors which are part of such a QAP were identified and the practices in the department against those factors were compared. The scoring was done based on the degree of compliance; complete, partial or no compliance.

**Results:** A total of 23 parameters/subparameters were evaluated to find out the extent of quality assurance program being implemented in the study setting. Out of maximum 230, a score of 135 was achieved by the department.

**Conclusion:** The department of radiodiagnosis in the tertiary care institute need to institute a QAP for improving the quality and efficiency for better utilization of resources.

**Keywords:** Radiodiagnosis, Quality, Quality assurance program.

**Key messages:** Quality Assurance Program must be instituted in different departments, Radio diagnosis in the instant case, for efficient utilization, quality output and effective cost control. All these will contribute to patient safety practices.

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## INTRODUCTION

Medical imaging has grown in leaps and bounds over the years and is looking to advance further. Newer imaging

modalities and upgradation of the existing ones have made the diagnosis more precise and treatment more definitive. It is hard to imagine a time when radioimaging was not available even though Roentgen first radiographed his wife's hand only a little over a century back.

The improvement in the technology has come at a price. The equipment are very costly and the radiological investigations form a substantial part of the overall expenditure on treatment.<sup>1,2</sup> The growth in advanced medical imaging is a major factor in the rising cost of medicare.<sup>3</sup>

It is ironical that unlike other industries, improvement in technology in health industry usually does not translate into decreased cost of service. The developed economies are struggling to meet the escalating cost of healthcare and the situation in developing countries is even grimmer. With scarce resources and growing demand, India faces the challenge of providing most modern expensive services to the patients as well as provisioning of basic health services for all the people. The two issues place conflicting demand on the limited resources devoted to this sector.

In case of radioimaging, it has to be kept in consideration that excess exposure to radiations does have detrimental effects on the patients. Therefore, it is very important the patients are not subject to unnecessary radiations. This can be achieved by rational approach to investigation as well as eliminating the need to re investigate because of poor quality.

The twin objectives of eliminating reinvestigation on account of poor quality and reducing the cost of radio-diagnosis can be achieved by instituting a quality assurance program in the discipline of radioimaging. Quality assurance as defined by ISO means part of quality management focussed on providing confidence that quality requirements will be fulfilled. It has been seen that a quality assurance program can result in tremendous reduction in cost due to elimination of wastage on images of nondiagnostic quality as well as decrease in unnecessary exposure.<sup>4</sup> The American College of Radiology (ACR) estimates that quality standards can save approximately \$5 billion in medicare costs over 10 years.<sup>5</sup> In fact according to health Canada these two, i.e. minimizing radiation exposure and cost effectiveness along with maintenance of the quality of diagnostic images are the three secondary objectives of a quality assurance program in Radiology. The primary objective is to ensure the consistent provision of prompt and accurate diagnosis of patients.<sup>6</sup>

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## MATERIALS AND METHODS

A cross-sectional study was conducted to evaluate the measures being taken to assure quality in the Radiology Department in a public sector tertiary care hospital located in a metropolis in India. The hospital has different wings with each wing having its own radiological installations except MRI which is a common facility. The radiology department located in the largest wing with more than 1,000 beds was studied during the second half of year 2008. In the year 2008 to 2009, the department conducted more than one hundred thousand X-ray investigations in the outpatient setting and another ninety thousand in Emergency and Inpatient Department. During this period more than Fifty thousand ultrasonograms and more than fifteen thousand CT scans were carried out. Besides these the department also performed special investigations like IVP, Barium studies and assisted in guided tests like biopsy, etc.

Despite the workload, the department did not have a documented quality assurance program (QAP). Hence, a checklist was formulated to assess different aspects of a QAP. The parameters were divided into structure, process and outcome measures and were derived from the literature and discussions with peers and experts. The parameters were further subdivided wherever required. The adherence to the parameters was evaluated as fully compliant, partial compliant or noncompliant and scored accordingly as 10, 5 or 0 respectively. The scoring pattern is similar to the one adopted by National Accreditation Board for Hospitals and Healthcare Providers for scoring during the accreditation of the healthcare organizations.

## OBSERVATIONS

A total of 23 parameters/subparameters were evaluated to find out the extent of QAP being implemented in the study setting. Since there was no documented QAP, the elements were enumerated and evaluated assuming that these would have been part of any such program.

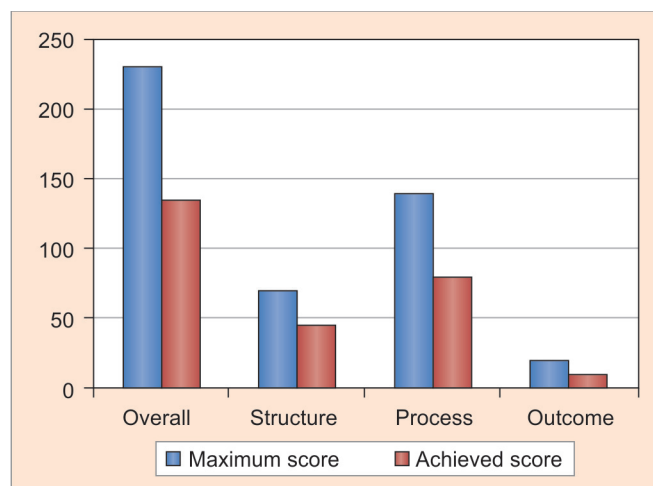


Fig. 1: Scores achieved by the department

The maximum possible score based on full compliance (i.e. score of 10) of each parameter/subparameter was 230. The structural elements could have a maximum score of 70 while process elements could have a maximum score of 140. The table below shows the maximum score and the score achieved by the Department of Radiology.

The detailed scores under each heading, i.e. structure, process and outcome are depicted in Tables 1 to 3.

## DISCUSSION

Quality assurance in radiology is a management tool which aims to ensure that every procedure is necessary and appropriate and is done safely to the satisfaction of patients and referring physician.<sup>7</sup>

Quality assurance program for radiology should have the following elements:<sup>8</sup>

- Authority and responsibility for the implementation of QAP should be delineated.
- Quality control monitoring and maintenance program should be established.
- Frequent evaluation of the quality control tests and effectiveness of the program should be done.
- Standards for image quality based on subjective or objective criterion should be established.

Table 1: Compliance to structure parameters

S.no	Parameter	No compliance (0)	Partial compliance (5)	Full compliance (10)
1.	Physical structure (Conformance to AERB guidelines)			√
2.	Signages (Radiation Hazard, PCPNDT Act, Procedure is on, Metallic prosthesis, etc.)		√	
3.	Waiting area (Adequacy, Disabled friendly)		√	
4.	Privacy (Changing room, Authorized entry)		√	
5.	Equipment (Acceptance tests, QC tests)			√
6.	PPE (Lead aprons, Gonadal & thyroid shields, Glasses to workers & patients)		√	
7.	Resuscitation equipment, especially in areas of interventional radiology		√	



**Table 2:** Compliance to process parameters

S.no	Parameter	No compliance (0)	Partial compliance (5)	Full compliance (10)
1.	Patient safety:			
	(a) Patient identification		√	
	(b) Informed consent		√	
	(c) History			√
	(d) Universal precautions		√	
2.	Radiation exposure:			
	(a) Radiographic positioning manual	√		
	(b) Loading factors manual	√		
	(c) ESE	√		
3.	Health worker safety:			
	(a) Radiation dose monitoring			√
	(b) Needle stick injury			√
	(c) Pregnant employee			√
4.	Training		√	
5.	Reporting incl. urgent reporting, clinical correlation, reduction in reporting time.			√
6.	Miscellaneous:			
	(a) Biomedical waste disposal	√		
	(b) Safe storage of narcotic drugs			√

e. Training and retraining of the personnel to upgrade the skills should be undertaken.

f. Records should be maintained and a written quality assurance manual should be made available to all the personnel.

Although different countries may have instituted QAP in their setup, e.g. JCAHO standards are being followed in US but it is essential that the standards are modified according to the region so as to develop a country specific or institution specific QAP.<sup>9</sup> But, the position statement of ACR enunciates certain elements which have universal application in any setting. These are equipment quality control, infection control, patient and health worker safety and patient education.<sup>10</sup> These and other elements were included in the checklist which was devised to measure the compliance to a QAP.

## STRUCTURE

Under the broad heading of structure: (a) physical structure of the room, (b) waiting area, (c) privacy, (d) signage, (e) equipment, (f) personnel protective equipment, (g) resuscitation equipment were studied. Any radiological installation in India has to follow the AERB guidelines as minimum essential criterion for structural safety before it is allowed to function. The department studied was no

exception to this. Scientifically designed signage facilitates the movement of patients and warns patients in case of potential hazards. The signage should be placed to warn the visitors regarding the hazards of radiation, any statutory obligation (e.g. PCPNDT Act-1994) and to inform when the procedure is undertaken in at least two languages. While statutory requirements were being followed, deficiencies were noted on other aspects. Due to the constraints of the space, the waiting area was insufficient to meet the needs of the patients. The privacy being provided to the patient while preparation (e.g. change of dress) as well as during the procedure (e.g. prevention of entry of nonauthorized personnel) is important to respect the dignity of the patient as well as instilling confidence in the patient regarding the services being offered. The department was partially compliant, with the provision of changing rooms only for the female patients and needs to do more to prevent intrusions by other visitors during the procedure.

Equipment being used are key elements for the successful functioning of any radiology department and most of the attention regarding quality control is generally focussed on this. Appropriate specifications, proper procurement procedure, quality control (QC) tests before installation and before and after commissioning, and regular maintenance (preventive as well as breakdown) are essential to achieve

**Table 3:** Compliance to outcome parameters

S.no	Parameter	No compliance (0)	Partial compliance (5)	Full compliance (10)
1.	RRAP	√		
2.	Duplicate reports			√

maximum utilization and efficiency. As mentioned earlier, a department has to make its own guidelines based on its requirements, availability of trained manpower as well as sales support to derive policy regarding equipment. The department was fulfilling all the components in this regard. Additionally, AERB is recommending all the vendors to perform quality assurance tests which further strengthen the quality control measures.

Personnel protective equipment (PPE) including lead aprons, gonad and thyroid shields are essential to prevent un-necessary radiation exposure to the staff as well as visitors. Even though PPE were being provided to the users; their upkeep was improper leading to probable breach in the protection being offered by these. The nursing orderlies were seen folding lead aprons while carrying these even though stands were provided.

The radiological procedures carried out are generally safe other than the effects of the radiation. But the patients may themselves be suffering from conditions which can lead to sudden complications. The use of low-osmolar nonionic contrast agents is associated with fewer adverse reactions than the high-osmolar agents.<sup>11,12</sup> Yet the requirement for lifesaving measures cannot be ruled out completely. Certain intervention procedures also carried out, e.g. ultrasound guided biopsy or aspiration. These may also result in unexpected reactions. The department was storing lifesaving medications in few areas only.

## PROCESS

Quality and patient safety are the two pillars of any accreditation process. The magnitude of the damage caused due to harm rendered to patients has been amply brought out by the famous IOM report: To err is human. Thus, patient safety was taken as one of the important cornerstone of QAP. Under the ambit of patient safety four key parameters were analyzed. These are: (a) patient identification, (b) informed consent, (c) history, and (d) universal precautions. During the observation of the practices being followed it was found that patients were identified by one method, i.e. radiologist calling out the name of the patient, which was less than desirable. At least two methods should be used since it is highly likely that more than two patients would have similar names or similar sounding names. The patients were not completely informed before consent was being taken and more time needs to be devoted to explain the aspects of intervention being planned. The history was being taken properly and the radiologist was not merely relying on the history being provided by the referring physician. Universal precautions were not being followed rigorously.

## ALARA Principle

Provision of best possible diagnostic information at a minimal radiation dose, i.e. ALARA principle (As Low As Reasonably Achievable) is a basic aim of QAP in radiology.<sup>13</sup> The three factors related to radiation exposure of the patients; radiographic positioning, loading factors and entrance skin exposure (ESE) were studied. The department had not placed any manual for these three at the place of exposure and hence were labelled as noncompliant on these counts.

## Employee Safety

Along with the safety of the patients, health worker safety also needs to be ensured. The radiation dose monitoring was being done with TLD batches and there were established protocols for needle stick injury as well as regarding pregnant employees.

## Training

All the employees including radiographers were qualified and trained in their respective field but the department was lacking in efforts to provide continuous training in the form of CME or workshop to its radiographers.

## Reporting

The results of different investigations were conveyed in time as per the policy of the hospital and in cases of abnormal results or findings requiring immediate attention of the physician; they were being conveyed on the phone. Cases were also being discussed in common clinical correlation meetings for the benefit of patients as well as referring physicians and radiologists.

## Miscellaneous

While the narcotic drugs were safely stored, biomedical waste was not being disposed off properly. Since it is a statutory requirement, hence, to emphasize its importance, it was assessed as noncompliant.

## OUTCOME

Duplicate reports were being issued on demand but the department had not instituted any program akin to reject or repeat analysis program. The analysis of the radiographs being rejected as insufficient by the referring physician as well as by radiologist and the requests to repeat the X-rays for any reason must be analyzed to determine the cause. This can point out the problem with the machine or men. Suitable measures could be taken based on the results of the analysis. This will prevent the recurrence of errors in future.

The department should set the acceptable benchmarks and try to improve upon. However, with the increased use digital X-ray equipments where image quality can be modified, the importance of such a program may decrease.

## CONCLUSION

Quality in medical imaging is aptly defined as ‘a timely access to and delivery of integrated and appropriate radiological studies and interventions in safe and responsive facility and prompt delivery of accurately interpreted reports by capable personnel in an efficient, effective and sustainable manner’. The different components of the definition cover the aspects which should be catered for when devising a QAP for Radiology Department. The commitment of the top leadership at the level of the department as well as hospital is essential for survival of such a program. The formation of quality assurance manual is absolutely necessary to operationalize such a program. And such a documented QAP is required to provide effective, efficient, timely and safe services to the patients as well as community.

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# Role of Employee Satisfaction in Influencing Patient Satisfaction

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## ABSTRACT

The proposed study is an attempt to understand the link between Outpatient Department (OPD) patient satisfaction and job satisfaction among front office executives of the OPD. The study was conducted in a 300 bedded multispecialty hospital in Delhi. The study is very important as the OPD is considered to be the mirror of any hospital, which reflects the functioning of the hospital being the first point of contact between the patient and the hospital staff. A structured questionnaire was used in conducting the study. Total 158 patients were interviewed during 2 months period. Stratified random sampling technique used in selecting the samples. Both type of patients, first timers and old patient participated in the study. As second part of the study, all 22 front office executives from the above-mentioned three concerned departments were participated. The age group of the employees ranged from 20 to 50 years.

**Keywords:** OPD, Front office, Patient satisfaction, Employee satisfaction, Third party administrator.

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## INTRODUCTION

It has been quite evident that organizations with a good working environment have better leverage to achieve customer satisfaction; at the same time it also proven that a specific key influencing factor of achieving customer satisfaction is employee satisfaction. There is a 'positive and high significant correlation between customer satisfaction and employee satisfaction'. Employee satisfaction is greatly related to service quality and to customer satisfaction. The proposed study is an attempt to understand the link between customer satisfaction and employee satisfaction between front office executives of the outpatient department (OPD) of a multispecialty hospital.

OPD services are one of the important functions of any hospital. It is the mirror of the hospital, which reflects the functioning of the hospital being the first point of contact between the patient and the hospital staff. Most of the corporate hospitals put lot of emphasize on delivering good care at the OPD services. Quality of services at various points in OPD is the prime concern of the management. One of the areas in OPD is front office or reception. According to the sections and services, the hospital may have multiple reception areas. The employees at reception are very busy in handling patient queries, registration appointments, counseling, cash collection, etc. Therefore, the employee satisfaction is one of the main variables in delivering quality services.

Healthcare employees' satisfaction have been found to have several impacts on the quality of care delivered which ultimately influences the level of patient satisfaction. Employee dissatisfaction negatively impacts the quality of care and ultimately has an adverse effect on patient loyalty and in turn hospital profitability. Quality improvement initiatives were shown to have a positive correlation with employee satisfaction. Healthcare employee moral also demonstrates a strong correlation with patient satisfaction scores, showing that the lack of commitment and engagement have far-reaching impacts on more than just employee turnover. Employee satisfaction also appears to have a strong relationship with the quality of care delivered and related costs. When employees are more satisfied it helps reduce stress, turnover, leaves of absence, and lower work-related disability and violence claims. Satisfied employees also were found to lead to shortened lengths of stay for patients and lower variable costs. The reductions in recruitment and retention costs and fewer employees missing work combined with lower patient variable costs and mistakes make improving employee satisfaction more appealing to administrators. By focusing on improving the quality of care, healthcare organizations can not only improve patient satisfaction, but also improve employee satisfaction and loyalty to the organization. This in turn will further impact the quality of care because of the interrelationship of this chain.

If changes can be implemented in one department with success, then the same changes can be attempted in other

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departments that may be experiencing the same issue of low customer satisfaction and low employee satisfaction. It is also possible that if department X, a large patient care department, is able to increase their customer satisfaction scores, the hospital mean satisfaction score will also rise. Completing this study will not only increase the awareness of how employee satisfaction impacts customer satisfaction, but it will also create a path to happier, more effective employees.

## LITERATURE REVIEW

There have been many studies done to understand the role of employee satisfaction on customer satisfaction. 'The Press Ganey Satisfaction Report (2003)', described that health-care system has done a good job that many patients take the technical aspects of their care for granted. But they are sensitive to how they are treated a persons, not merely as bodies. This means that hospitals need to foster a culture of responsiveness to patients. Staff should attend to the concerns of every patient, and understand that these concerns include emotional and spiritual, as well as physical issues.<sup>1</sup> This is the essence of customer service in the healthcare arena. This particular type of customer, a patient, expects the equipment to be current and treatments to be effective in all healthcare institutions. The variable among healthcare organizations is how the patient is treated. Customers are scrutinizing 'the how' of service provision, not just 'the what' of service. If a customer is satisfied with the way the product is delivered, a positive relationship will develop between the consumer and the provider. This is especially evident when consistency in the provision of services is attained. The customer will return for the cares that they perceive as high quality and the institution will have profitability.<sup>2</sup> One of the major issues healthcare providers deal with, when considering customer service are the ideals that defines it. Health Care's Management, Myopia states that the health-care industry has three concepts that paint its identity. These are: thinking of itself as a thing rather than a place, the patient experience is managed only within facility walls, and the business is defined by diagnoses and treatments of diseases rather than as health management. These ideals are important to note when asking for feedback from the customer's viewpoint. Patients often begin, evaluating the healthcare experience even before they enter through the doors. There are certain expectations initiated by the first phone call or from a previous encounter with an institution. The evaluation by the customer continues through the healthcare event and ends with the recovery period. It is vital to capture all aspects of the customer experience with any survey tool chosen by an organization.<sup>3</sup>

Overall, most customers of the healthcare industry, patients, will be satisfied or very satisfied with their experiences. 85% of patients in average hospitals rank care as good or very good. Hospital executives have the challenge of encouraging staff not to become content with these good ratings. Healthcare providers can become preoccupied with those customers who have a poor experience with the facility and give low ratings. The real challenge is to increase the overall satisfaction scores by having more patients experience a very good occurrence rather than simply a good one.<sup>4</sup>

When hospital staff does a good job according to their job description, but without warmth or sincerity, then patients will likely rate their satisfaction as 'fair' or 'average'. If the employees add some sensitivity and courtesy, the experience rating can increase to a 'good' or 'satisfied'. But add some touches that exceed the expectations of what the patient had for their care, the rating of satisfaction will reach the 'very good' or 'excellent' mark.<sup>5</sup>

It is important to realize that one bad experience can flavor the future encounters with the healthcare facility. It is also noteworthy to recognize that one individual employee can influence the outcome of an entire customer experience. It is unrealistic to believe that department managers can supervise all employees all the time to determine if they are treating customers in an acceptable manner. It is important to manage customer service activities through a facility's culture of providing exceptional customer service when delivering the procedures or treatments.<sup>6</sup> With a customer service culture, service encounters are managed by all staff. Employees are vested in customer service concepts from the hiring process through the annual evaluation of observed service practices. This concept makes all employees responsible and managers of 'very good' experiences.

Employees are curious on what other employees saw as both strengths of the organization as well as areas that need improvement. Other useful information includes how the particular department compares to other departments in the same organization as well as against national benchmarks.<sup>1</sup> Action plans also need to be aligned to the strategic need of the entire company.<sup>7</sup> The managers are again encouraged to involve their employees. Here is an opportunity for employees to become engaged in the process improvements that need to occur and understand their personal roll.<sup>1</sup> Employees can become disconnected from their jobs, because of never ending changes and challenges to perform better.<sup>8</sup> Involving the employees at the beginning of the planning process, keeps them focused on the positive aspects that change can bring to their job. Empowering employees allows them to think for themselves, encourages creativity, and produces more efficient workers.<sup>9</sup> Because the employees have been part of developing or improving

a process, they will have ownership and seek to see their suggestions succeed. Employees, who are not empowered, tend to be more apathetic toward their job and seem to just go through the motions without any interest in performing better. The involvement of employees in not only the feedback process, but also the strategic planning process can only bring about workable plans that can be implemented at the department level and possibly at the hospital wide level.<sup>1</sup>

Definition of empowered employees—‘It is seeing the gifts and the talents, the caring and the intelligence in another person and helping them live up to that’.<sup>10</sup> Managers of healthcare departments need to see the potential in their employees to provide accurate, timely care to patients with the flair of customer service. This will tie the employee to the customer who will be satisfied with the facility.

As discussed earlier in the section on customer satisfaction, there is an issue on how healthcare identifies itself. Many healthcare facilities focus efforts in relaying to customers how modern their equipment is or how safe their procedures are. When looking at the satisfaction of healthcare customers, they expect all institutions to have modern equipment and safe practices. The difference is how the front line care providers connect with the person and show understanding and empathy as they administer the cares.<sup>1</sup> Another useful information may be the attrition rate or churn rate or employee moves. While a zero percent attrition rate may be ideal, but it is not likely.<sup>11</sup> As Bernadette Kenny reports in ‘Forbes’ magazine, any rate below 15 percent annually is considered healthy and no cause for alarm. This means that a company of 200 workers can lose 30 individuals within a calendar year without it becoming a problem.<sup>12</sup> Human Resource Departments have struggled in the past on how to relate the ‘people expense’ to the bottom line. It is through customer service provided by the employees that will cause a patient to return and subsequently bring in revenue.<sup>13</sup>

Healthcare has struggled with this concept as, historically, customers of healthcare have ‘needed’ those services provided by healthcare institutions. Choices were not available and consumers had blind faith that all healthcare facilities would provide them what they needed. Now with competition for customers and more educated customers, the service side has become more important than just the accessibility of healthcare systems. Employee satisfaction is especially high in service organizations that not only deliver high value to customers but do it through frontline service workers who are carefully selected, well-trained, given latitude to solve customer problems, compensated at least in part on their performance, and even given responsibility for ensuring that their positions are staffed.<sup>2</sup>

The above studies show the results from the literature review of the relationship between employee satisfaction and patient satisfaction.

## METHODOLOGY

### Objective

The objective of the study is to identify the level and factors responsible for patient satisfaction with respect to their experience at front office. The study also examines the relationship between front office employee’s job satisfaction and patient satisfaction.

### Research Design

Descriptive and analytical research designs were used to conduct the study. Employees were interviewed according to a structured questionnaire, where both patient and employee satisfaction questions were included. Another questionnaire was used to identify the patient satisfaction level. Many activities like patient traffic control, front office staff absenteeism, patients quarrel were also observed during the study period.

### Tool Used

A structured questionnaire was used in conducting the study. The questionnaire for employees consisted of employee details and a total of 19 questions out of which 14 were close ended and rest 5 were open ended. On the other hand, questionnaire for patients consisted of patient details and a total of 12 questions out of which 11 were close ended and one was open ended.

### Sample Size

Total 158 patients were interviewed during 2 months period. Stratified random sampling technique used in selecting the samples. Both type of patients, first timers and old patient participated in the study. Three types of patients participated in the study, i.e. cash patients, international patients and TPA/corporate patients.

As second part of the study, all 22 employees from the concerned departments were participated. The age group of the employees ranged from 20 to 50 years. The supervisors of the departments were also interviewed. The staff interviewed consisted of 22 employees having largest population of executives (40.9%) and assistants (36.4%) mostly from the registration department (36.4%). 59.1% of staff interviewed were males. Out of the total employees participated in the study, mostly were from the age group of 20 to 25 years (40.9%).

### Sample Background

Out of total patients participated in the study, majority belonged to the age group of 20 to 40 years (63.9%). The

sample population showed greater percentage of males (63.3%) than females (36.7%). 61.4% of the population was from Delhi itself. Most of the interviewed patients were graduates (51.9%). Out of 19 specialities in the hospital, maximum patients interviewed were of medicine (24.7%).

### Data Analysis

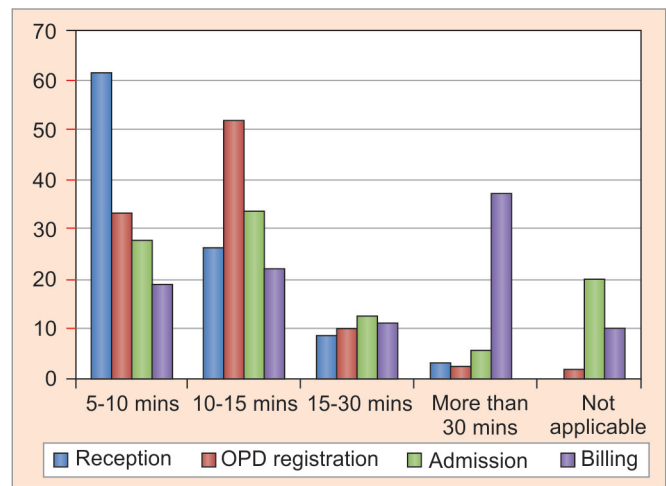
As specified above, the data were collected from three different types of front offices, i.e. TPA help desk, Main registration and international patient's desk. Data collected with the help of questionnaires was analyzed using SPSS software package and results were interpreted.

### FINDINGS

It was observed that apart from medical and nursing care other support facilities provided by the hospital like front office, also play a major role in customer satisfaction. Many activities are being processed through front office like discharge, registration, billing, report collection, enquiry and counseling. Patient can be highly dissatisfied by these services even though they are satisfied with actual medical care. Large percentages of respondents (65.8%) were satisfied with the behavior of staff. According to them majority of the front office staff were courteous and polite. The remaining respondents who rated the staff as average or below average (needs improvement) think that there is a scope of improvement in professional efficiency of staff. 56.3% of the study population agree that the cleanliness is good. Rest rate it average or it needs improvement. Also, the seating arrangement (58.9%), signage and directions (72.8%), drinking water and washroom facilities (51.9%) were also found to be good as per stated responses. Although, majority of the respondents agreed that other facilities like food, newspaper, mobile charging points are good but required in more numbers in order to cater high volume during peak hours.

Appointment system for taking doctor's appointment was recently introduced. Therefore, majority of the respondents were not familiar with the system (53.2%). But, the patients who used the appointment system were mostly satisfied with it. But nearly 5.0% were not satisfied with the system because the patient who had the appointment for a particular time period could not see the doctor due to high backlog cases. The time spent by the patient on various activities were also analyzed and explained in the Graph 1.

To understand the role of various influencing factors on patient satisfaction at all, the selected front offices, correlation coefficient is calculated between various dependent and independent variables. The result of correlation is explained in the Table 1.



Graph 1: Time spent on different activities at the reception

From the Pearson correlation reported in Table 1 mentioned-above, Courteousness and Politeness is one of the main influencing factor and found to be highly correlated with different factors like TPA and corporate patients satisfaction level ( $r = 0.544$ ,  $p < 0.01$ ), satisfaction with front office staff ( $r = 0.495$ ,  $p < 0.01$ ) and overall satisfaction with the hospital ( $r = 0.602$ ,  $p < 0.01$ ). Another independent variable, i.e cashless approval time is found to be highly correlated (negatively) with TPA and Corporate patients satisfaction level ( $r = -0.785$ ,  $p < 0.01$ ) and overall satisfaction level ( $r = 0.522$ ,  $p < 0.01$ ). Approval time is also negatively correlated with overall satisfaction level ( $r = -0.583$ ,  $p < 0.01$ ). Seating arrangement ( $r = 0.332$ ,  $p < 0.01$ ) and availability of water and washroom facility ( $r = 0.388$ ,  $p < 0.01$ ) is also correlated with satisfaction with front office staff.

### Employee Satisfaction and Its Influence on Patient Satisfaction

The independent analysis of employee satisfaction revealed great deal of dissatisfaction among employees. Responses of employees on various satisfaction parameters are explained in Table 2. This shows that there was problem with almost every factor which was considered for measuring employee satisfaction. The employees are not at all happy with benefits program and expressed that organization is exploiting them. A large percentage of employees say that there is no clarity in the service rules defined by the organization. It was a general observation that the job description and job profile of the employees were not providing a clear picture of employee's duties and responsibilities. This further lead to overlapping of the functions of employees and they become multipurpose workers. Another problem was with the new employees who have joined the organization in last one year. There was no proper induction or training given while they joined the

**Table 1:** Correlation among various patient satisfaction variables

	<i>Courteous and politeness</i>	<i>TPA and corporate patients</i>	<i>Approval time</i>	<i>Satisfaction with front office staff</i>	<i>Water and washroom facility</i>	<i>Seating arrangements</i>	<i>Overall satisfaction</i>
Courteous and politeness	1						
TPA and corporate patients	0.544	1					
Approval time	0.091	-0.785**	1				
Satisfaction with front office staff	0.495**	-0.025	-0.051	1			
Water and washroom facility	0.296*	0.030	-0.016	0.388**	1		
Seating arrangements	0.263*	0.113	0.068	0.332**	0.386**	1	
Overall satisfaction	0.602	0.522**	-0.583**	0.143	-0.013	-0.138	1
	0.000	0.000	0.000	0.074	0.871	0.084	

**Table 2:** Employee's responses for various factors responsible for employee satisfaction

<i>Components</i>	<i>Strongly agree</i>	<i>Agree</i>	<i>Disagree</i>	<i>Strongly disagree</i>	<i>Not applicable</i>	<i>Total</i>
Family friendly place	13.63	40.9	31.81	13.63	0	100
Clarity of service rules	0	27.27	63.63	9.09	0	100
Value of teamwork	18.18	22.72	31.81	22.72	4.54	100
Adequate orientation for new employees	0	36.36	54.54	9.09	0	100
Opportunity for improvization of skills	4.54	18.18	31.81	18.18	27.27	100
Usefulness of performance evaluation	4.54	31.81	9.09	9.09	45.45	100
Usefulness of total benefits programe	0	13.63	50	31.81	4.54	100
Friendliness and helpfulness by supervisor	27.27	36.36	22.72	13.63	0	100
Support for employee suggestions	22.72	36.36	22.72	18.18	0	100
Communication of info from management	4.54	18.18	22.72	9.09	45.45	100
Commitments to quality service	0	31.81	59.09	9.09	0	100
Value of individual employee	4.54	22.72	40.9	27.27	4.54	100
Fair treatment to employees	9.09	27.27	36.36	27.27	0	100

organization. They were also not informed or provided with clear job profile and responsibilities.

It is also surfaced that the informal training is the duty of the immediate supervisor and is given when a supervisor is asked for it. The front office employees of the hospital themselves believe that the organization is not committed to providing quality care to its customers. This was due to the fact that the employees themselves feel that they are being overloaded with the work and patients remain in the queue for hours in case of rush hours. All these above factors are responsible for these employees to feel that they are not properly looked after by the organization.

Various selected factors responsible for employee satisfaction and patient satisfaction were considered for correlation to understand the significance level. The result of the correlation is explained in the Table 3.

The correlation coefficient was calculated between factors of patient satisfaction and employee satisfaction. The result of correlation between overall patient satisfaction and satisfaction among TPA coordinators ( $r = 0.522$ ,  $p < 0.01$ ) is very high, which shows that TPA coordinators are highly

satisfied and providing good service to its customers. But, the correlation coefficient between overall patient satisfaction and value of individual employee in the organization ( $r = -0.437$ ,  $p < 0.01$ ) and fair treatment by employer ( $r = -0.465$ ,  $p < 0.01$ ) shows a high but negative value, that shows both these parameters are negatively correlated. In another response where employee's years of experience in current hospital was correlated with two important factors, i.e. family friendly atmosphere ( $r = -0.388$ ,  $p < 0.01$ ) and clear guidelines for promotion ( $r = -0.602$ ,  $p < 0.01$ ) also express negative relationship between these factors.

## CONCLUSION

Previous studies have shown that patient satisfaction plays a key role in the health and future success of any healthcare service organization. When patients are satisfied, they keep coming back to the same organization for the services and also refer their friends to do the same. The organization should not forget to pay attention to employees needs — an action that is often overlooked in our competitive business



**Table 3:** Correlation of employee satisfaction and patient satisfaction factors

	<i>Satisfaction of TPA coordinators</i>	<i>Satisfaction of foreign patients</i>	<i>Front office staff satisfaction</i>	<i>Value of individual employee</i>	<i>Fair treatment</i>	<i>Overall patient satisfaction</i>
Satisfaction of TPA coordinators	1					
Satisfaction of foreign patients	-0.228** 0.004					
Front office staff satisfaction	-0.025 0.756	0.116 0.146	1			
Value of individual employee	0.221** 0.005	-0.138 0.085	-0.148 0.064	1		
Fair treatment	0.246** 0.002	-0.140 0.079	-0.130 0.104	0.850** 0.000	1	
Overall patient satisfaction	-0.522** 0.000	0.268** 0.001	0.143 0.074	-0.437** 0.000	-0.465** 0.000	1

environment. Organizations that attend to employee satisfaction can improve internal moral, prevent turnover, and enhance customer satisfaction.

In the study a number of major findings emerged from the outpatient satisfaction study. Patients were found to be satisfied with both the physical and behavioral dimensions of service and the overall patient satisfaction is high. The correlations between various factors were positively significant. At the same time employees were having some issues with the organization. This was further revealed in the correlation among various related factors. From the study it is clear that employees have some genuine issues with the organization but that is not reflecting while they deal with the patients and patients are satisfied with the front office staff to a great extent. From the literature it is also observed that in patient satisfaction study, which is the reluctance of patients to express their true feelings about the care they received, and also the 'generosity' factor as an intervening factor. Nonetheless, the outcome of the study cannot be ignored altogether despite the apprehensions.

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# Laws Applicable to Medical Practice and Hospitals in India

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## ABSTRACT

Healthcare in India features a universal healthcare care system run by the constituent states and territories. Law is an obligation on the part of society imposed by the competent authority, and noncompliance may lead to punishment in the form of monetary fine or imprisonment or both. The earliest known code of laws called the code of Hammurabi governed the various aspects of health practices including the fees payable to physician for satisfactory services. The first ever code of medical ethics called the Hippocratic oath was laid down 2500 years ago, in the 5th century BC, by Hippocrates—the Greek physician. The modern version of Hippocratic Oath (called the declaration of Geneva), devised by the WHO after the second world war and is accepted by international medical fraternity. The process of establishment of healthcare system during the colonial rule also necessitated creation of legislative framework for practitioners of medicine. As the number of doctors qualified in Indian medical colleges increased, creation of laws for them became necessary. The medical council of India, a national level statutory body for the doctors of modern medicine, was constituted after the enactment of Indian Medical Council Act 1933. The first legal recognition and registration for the Indian systems of medicine came when the Bombay Medical Practitioner' Act was passed in 1938.

Laws governing the commissioning of hospital are the laws to ensure that the hospital facilities are created after due process of registration, the facilities created are safe for the public using them, have at least the minimum essential infrastructure for the type and volume of workload anticipated and are subject to periodic inspections to ensure compliance. There are other laws pertaining to governing to the qualification/practice and conduct of professionals, sale, storage of drugs and safe medication, management of patients, environmental safety, employment and management of manpower, medicolegal aspects and laws pertaining to safety of patients, public and staff within the hospital premises. There are laws governing professional training and research, business aspects, licences/certifications required for hospitals, etc. A hospital administrator should be aware about all these laws, regulations, policies, procedures, reports and returns and keep abreast with the latest amendments to be on the safe side of law and provide quality care to the patients.

**Keywords:** Healthcare, Law, Act, Code, Health practices, Medical ethics, Hippocratic, Declaration of Geneva, Medical council of India, Statutory body, Indian systems of medicine, Commissioning

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## INTRODUCTION

Human culture is built upon the formulation of values that form the basis of an ethical society, honesty, integrity, respect, pursuit of excellence, civic duty, accountability and loyalty. Since the dawn of civilization, by trial or error, it has become established that a society and more so its medical profession, a public oriented and noble profession, can survive and thrive only by observance and practice of certain rules of conduct guided by ethical, moral, legal and social values of land.

Healthcare in Indian features a universal healthcare care system run by the constituent states and territories. The constitution charges every state with 'raising the level of nutrition and the standard of living of its people and improvement of public health as among its primary duties. Law is an obligation on the part of society imposed by the competent authority, and noncompliance may lead to punishment in the form of monetary fine or imprisonment or both.

In a survey conducted at Mumbai, eight out of 10 doctors feel that the laws that govern the practice of healthcare in India are outdated and even higher majority feels that there are too many laws and licences that are required to keep their practice going. A survey among 297 doctors across specializations says that there are about 50 different laws that govern the practice of healthcare in India. The study conducted by Medscape India, a nonprofit trust of doctors, revealed that 78% of doctors feel that many of the laws that govern medical practice are outdated. Licences have to be procured by doctors running a hospital every year.<sup>1</sup>

## MEDICAL LAWS IN INDIA

The earliest civilization known to us is the Indus urban culture of 3000 to 2000 BC. The renowned medical historian Henry Sigerist<sup>2</sup> believed that public health facilities of Mohenjo Daro were superior to those of any other community of the ancient orient. Since the ancient times, certain duties and responsibilities have been cast on persons who adopt this

sacred profession. This is exemplified by Charak's Oath (1000 BC) and Hippocratic Oath (460 BC). The written evidence of the state's involvement and regulatory function is available from the Kautilya's Arthashastra. Kautilya considered famine as a bigger calamity than pestilence and epidemics, as the remedies can be found for the diseases. He believed that the king should order the physician to use medicine to counter epidemics.<sup>3</sup>

The earliest known code of laws of health practices were the laws formulated around 2000 BC by Hammurabi, the great king of Babylon. These laws, also called the code of Hammurabi governed the various aspects of health practices, including the fees payable to physician for satisfactory services. The laws were drastic and penalties for harmful therapy stringent. Doctors whose proposed therapy proved wrong ran the risk of being killed. This was the first codification of medical practice.

The first ever code of medical ethics called the Hippocratic oath was laid down 2500 years ago, in the 5th century BC, by Hippocrates—the Greek physician. He is remembered till today as the 'Father of western medicine'. Hippocratic oath has been guiding and regulating the conduct of doctors for centuries. The modern version of Hippocratic Oath (called the declaration of Geneva), devised by the WHO after the second world war and accepted by international medical fraternity as the international code of medical ethics, draws heavily upon the ancient oath.

During the Ashoka period (270 BC), the state showed interest in the public works and provision of medical care and as a law. He founded hospitals all over his empire with medical attendance at state expense.<sup>4</sup> Ethics is described in the Charaka—Samhita, in details and Ayurvedic physicians of ancient India has a well-defined medical ethics".<sup>5</sup>

The colonial power brought with them their own physicians and barber surgeons. In the mid 19<sup>th</sup> century, as the medicine got recognized in England, it slowly started having its impact in India too. After 1857, the main factors that shaped colonial health policy in India were their concern for troops and European civil population.<sup>6</sup>

The process of establishment of healthcare system also necessitated creation of legislative framework for practitioners of medicine. In the earlier period of rule, the physicians and surgeons brought by the East India company and after 1857 by the British Government, needed some discipline and regulations. Lt Colonel DG. Crawfords 'A history of Indian medical services, 1600-1913' narrates several instances of in-discipline, insubordination, malpractice, etc. by such doctors and the punishments (including deportation) meted out to them. It also narrates the regulation devised by the East India Company for the hospitals established by them.

After the enactment of the law, establishing General Medical Council in 1857 in England, the British doctors employed in India were registered with the GMC and came under its disciplinary regulation. As the number of doctors qualified in Indian medical colleges increased, creation of laws for them became necessary.

As a part of criminal procedures and for other purposes, the colonial government had, in 1871, enacted Coroner's act applicable to Bombay and Calcutta. It defined the role of medical professionals in the work of conducting autopsy and inquests. However, the laws for the creation of indigenous medical councils took many more years for enactment. Mean-while, the laws were enacted for the prevention of the spread of dangerous epidemic disease, for the segregation and medical treatment of pauper, etc. The epidemic disease act was first enacted in 1807 and is still in force with amendments, while the Lepers Act 1898 was repealed and substituted by another law in early 1980s.

Grant Medical College Society in 1880 passed a Bombay Medical Act and established the medical council. The draft rule of this act included the appointment of a registrar, maintenance of name in register and penalty for doing wrong things. The Bombay Presidency enacted Bombay Medical Act in 1912. Medical acts in some other provinces soon followed. The Bengal Medical Act and Madras Medical Registration Act were enacted in 1914.

These provincial acts were immediately followed by the Indian Medical Degree Act, passed by the Indian Legislative Council and approved by the Governor General in 1916.

The Medical Council of India, a national level statutory body for the doctors of modern medicine, was constituted after the enactment of Indian Medical Council Act 1933. The first legal recognition and registration for the Indian systems of medicine came when the Bombay Medical Practitioner Act was passed in 1938.

## Post 1947 Developments

The independence in 1947 inaugurated a new phase of development of organized health care services creating more entitlement for the people. Along with that, the state also embarked on enactment of new laws, modification of the colonial laws and judiciary developed case laws to consolidate people's entitlement of health care and to extent the rights.

At the time of independence and the first few years of planning, the task confronting the country was to create physical and institutional infrastructure for the rapid development or modernization of India.

With time, the parliament has passed a large number of bills and acts to strengthen the healthcare delivery in India.

## Prerequisites of Medical Practice

A duly qualified medical professional, i.e. a doctor has a right to seek to practice medicine, surgery and dentistry by registering himself with the medical council of the state of which he is resident, by following the procedure as prescribed under the medical act of the state.

The state medical council has the power to warn, refuse to register/remove from the name of a doctor who has been sentenced by any court for any nonbailable offence or found to be guilty of infamous conduct in any professional respect. The state medical council has also the power to re-enter the name of the doctor in the register.

The provision regarding offences and professional misconduct which may be brought before the appropriate medical council (state/medical Council of India) have been stated in the Indian Medical Council (Professional conduct, etiquette and ethics) Regulation 2002. No action against a medical practitioner can be taken unless an opportunity has been given to him to be heard in person or through an advocate.<sup>7</sup>

## Emergency Healthcare and Laws

The supreme court has been emphatic in declaring that the fundamental right to life covered within its scope the right to emergency healthcare. The landmark judgment that marked this momentous event is that of Parmanand Katara V, Union of India (Supreme Court 1989). In this case, a scooterist severely injured in a road accident was refused for admission when taken to nearest hospital on the excuse that hospital was not competent to handle medicolegal cases. The supreme court, in its judgment, pronounced that the obligation of medical professionals to provide treatment in cases of emergencies overrode the professional freedom to refuse patients. According to the right to emergency treatment, the status of a fundamental right under Article 21 (fundamental right of life), the court categorically stated that 'Article 21 of constitution casts the obligation on the state to preserve life. Interestingly, the supreme court went on to say that not only government hospitals but also 'every doctor whether at a government hospital or otherwise has the professional obligation to extend his/her service with due expertise for protecting life.

In another case (Paschim Banga Khet Majdoor Samity vs State of West Bengal, Supreme Court, 1996), a person suffering from head injuries from a train accident was refused treatment at various hospital on excuse that they lacked the adequate facilities and infrastructure to provide treatment. In this case, supreme court further developed the right to emergency treatment, and went on to state that the failure on the part of government hospital to provide timely medical treatment to a person in need of such treatment results in violation of his/her right to life guaranteed under Article 21.

## Criminal Liability in Medical Profession

Criminal law tries to mold the individual behavior in a socially accepted manner. It tries to enforce the rules of social mortality to a great extent. Criminal law defines certain types of human conduct as offences and prescribes the punishment for them. Remission by doctors in their duties and obligations and lapses left by them may give to criminal liabilities, the liabilities of being prosecuted in a criminal court and awarded punishment as per provision of law.

The criminal law operates on a doctor in somewhat a different manner than an ordinary persons. This is because it allows a doctor to cause injury to the patient for preventing a greater harm. The crucial area of criminal law for a doctor is offences affecting life. These offences are mainly murder, simply hurt, grievous hurt and miscarriage or abortion. A doctor may be charged for any of these offences in general. However, the criminal law arms a doctor with three formidable defences namely: (1) informed consent, (2) necessity and (3) good faith.

Various criminal liabilities in medical practice related to different sections of Indian Penal Code, the code of criminal procedure and different acts like MTP, PCPNDT, Transplantation of Human Organ Act, etc.

## LAWS APPLICABLE TO HOSPITALS

### Laws Governing the Commissioning of Hospital

These are the laws to ensure that the hospital facilities are created after due process of registration, the facilities created are safe for the public using them, have at least the minimum essential infrastructure for the type and volume of workload anticipated, and are subject to periodic inspections to ensure compliance. These are listed in Table 1 below:

**Table 1:** Laws governing the commissioning of hospital<sup>8</sup>

1. Atomic Energy Act 1962
2. Delhi Lift Rules 1942, Bombay Lift Act 1939
3. Draft Delhi Lifts and Escalators Bill 2007
4. Companies Act 1956
5. Indian Electricity Rules 1956
6. Delhi Electricity Regulatory Commission (Grant of consent for captive power plants) Regulations 2002
7. Delhi Fire Prevention and Fire Safety Act 1986, and Fire Safety Rule 1987
8. Delhi Nursing Home Registration Act 1953
9. Electricity Act 1998
10. Electricity Rules 1956
11. Indian Telegraph Act 1885
12. National Building Act 2005
13. Radiation Protection Certificate from BARC
14. Society Registration Act
15. Urban Land Act 1976
16. Indian Boilers Act 1923
17. The Clinical Establishment (Registration and Regulation) Bill 2007



## Laws Governing to the Qualification/Practice and Conduct of Professionals

These are the regulations to ensure that staff employed in the hospital for delivery of healthcare are qualified and authorised to perform certain specified technical jobs within specified limits of competence and in accordance with standard codes of conduct and ethics, their credential are verifiable from the registering councils and in case of any professional misconduct the councils can take appropriate action against them. These laws are listed in Table 2.

**Table 2:** Laws governing to the qualification/practice and conduct of professionals

1. The Indian Medical Council Act 1956
2. Indian Medical Council (Professional Conduct, Etiquette, and Ethics Regulations 2002)
3. Indian Medical degree Act 1916
4. Indian Nursing Council Act 1947
5. Delhi Nursing Council Act 1997
6. The Dentist's Act 1948
7. AICTE Rules for Technicians 1987
8. The Paramedical and Physiotherapy Central Councils Bill 2007
9. The Pharmacy Act 1948
10. The Apprenticeship Act 1961

## Laws Governing to Sale, Storage of Drugs and Safe Medication

These are laws to control the usage of drugs, chemicals, blood, blood products, prevent misuse of dangerous drugs, regulate the sale of drugs through licences, prevent adulteration of drugs and provide for punitive action against the offenders. These are listed in Table 3.

**Table 3:** Laws governing to sale, storage of drugs and safe medication

1. Blood Bank Regulation Under Drugs and Cosmetics (2nd Amendment) Rules 1999
2. Drugs and Cosmetics Act 1940 and Amendment Act 1982
3. Excise permit to store the spirit, Central Excise Act 1944
4. IPC Section 274 (Adulteration of drugs), Sec 275 (Sale of Adulterated drug), Sec 276 (Sale of drug as different drug or preparation), Sec 284 (negligent conduct with regard to poisonous substances)
5. Narcotics and Psychotropic Substances Act
6. Pharmacy Act 1948
7. Sales of Good Act 1930
8. The Drug and Cosmetics Rule 1945
9. The Drugs Control Act 1950
10. VAT Act/Central Sales Tax Act 1956

## Laws Governing Management of Patients

These are the laws for setting standards and norms for conduct of medical professional practice, regulating/prohibiting performance of certain procedure, prevention

of unfair practices and control of public health problems/ epidemic disease. They deals with the management of emergencies, medicolegal cases and all aspects related there to including dying declaration, and conduct of autopsy and the types of professional negligence. These laws are listed in Table 4.

**Table 4:** Laws governing management of patients

1. Birth and Deaths and Marriage Registration Act 1886
2. Drugs and Magic Remedies (Objectionable) Advertisement Act
3. Guardians and Wards Act 1890
4. Indian Lunacy Act 1912
5. Law of Contract Section 13 (for consent)
6. Lepers' Act
7. PNDT Act 1994 and Preconception and Prenatal Diagnostic Tech (prohibition of sex selection) Rules 1996 (Amendment Act 2002)
8. The Epidemic Disease Act 1897
9. Transplantation of Human Organ Act 1994, Rules 1995
10. The Medical Termination of Pregnancy Act 1971
11. Medical Termination of Pregnancy Rules 2003
12. The Mental Health Act 1987

## Laws Governing Environmental Safety

These are the laws aimed at protection of environment through prevention of air, water, surface, noise pollution and punishment of offenders. These laws are listed in Table 5.

**Table 5:** Laws governing environment safety

1. Air (prevention and control of pollution) Act 1981
2. Biomedical Waste Management Handling Rules 1998 (Amended on 2000)
3. Environment Protection Act and Rule 1986, 1996
4. NOC from Pollution Control Board
5. Noise Pollution Control Rule 2000
6. Public Health Bye Law 1959
7. Water (prevention and control of pollution) Act 1974
8. Delhi Municipal Corporation (malaria and other mosquito borne diseases) Bye Law 1975
9. The Cigarettes and Other Tobacco Products (prohibition of advertisement and regulation of trade and commerce, production, supply and distribution) Bill 2003
10. Prohibition of Smoking in Public Places Rules 2008
11. IPC Section 278 (making atmosphere noxious to health), Sec 269 (negligent act likely to spread infection or disease dangerous to life, unlawfully or negligently)

## Laws Governing Employment and Management of Manpower

This group deals with the laws regulating the employment of manpower, their salaries and benefits, service rules and system of redressal of grievances and disputes. These laws are listed in Table 6.

**Table 6:** Laws governing to employment and management of manpower

1. Bombay Labor Welfare Fund Act 1953
2. Citizenship Act 1955
3. Delhi Shops and Establishment Act 1954
4. Employee Provident Fund and Miscellaneous Provision Act 1952
5. Employment Exchange (compulsory notification of vacancies) Act 1959
6. Equal Remuneration Act 1976
7. ESI Act 1948
8. ESI Rules 1950
9. Indian Trades Union Act 1926
10. Industrial Dispute Act 1947
11. Maternity Benefits Act 1961
12. Minimum Wages Act 1948
13. Negotiable Instrument Act 1881
14. Payment of Bonus Act 1956
15. Payment of Gratuity Act 1972
16. Payment of Wedges Act 1936
17. Persons with Disabilities Act 1995
18. PPF Act 1968
19. SC and ST ACT 1989
20. Shops and Factories Act (for national holiday)
21. TDS Act
22. The Essential Service Maintenance Act 1981
23. The Payment of Gratuity Act 1972
24. Workmen's Compensation Act 1923

### Laws Governing to Medicolegal Aspects

These are the laws governing the doctor-patient relationship, legal consequences of breach of contract and medicolegal aspects of negligence of duty. These laws are listed in Table 7.

**Table 7:** Laws governing to medicolegal aspects

1. Consumer Protection Act 1986
2. Indian Evidence Act
3. Law of privileged communication
4. Law of torts
5. IPC Section 52 (good faith), Sec 80 (accident in doing lawful act), Sec 89 (for insane & children), Sec 90 (consent under fear) , Sec 92 (good faith/consent), Sec 93 (communication in good faith).

### Laws Governing the Safety of Patients, Public and Staff within the Hospital Premises

These laws deal with safety of facilities and services against any accidental hazards that may endanger the lives and the liability of management for any violation. These laws are listed in Table 8.

**Table 8:** Laws governing the safety of patients, public and staff within the hospital premises

1. The Radiation Surveillance Procedures for the Medical Application of Radiation 1989, Radiation Protection Rules 1971
2. AERB Safety Code no. AERB/SC/Med-2(rev-1) 2001
3. Arms Act 1950
4. Boilers Act 1923
5. Explosive Act 1884 (for diesel storage)
6. Gas Cylinder Rules 2004
7. Insecticide Act 1968
8. IPC Section 336 (act endangering life or personal safety of others), Sec 337 (causing hurt by act endangering life or personal safety of others), Sec 338 (causing grievous hurt by act endangering the life and personal safety of others).
9. NOC from chief fire office
10. Periodic fitness certificate for operation of lifts
11. Petroleum Act and Storage Rules 2002
12. Prevention of Food Adulteration Act 1954
13. The Indian Fatal Accidents Act 1955
14. The Tamil Nadu Medicare Service Persons and Medicare Service Institutions (prevention of violence and damage or loss to property) Act 2008

### Laws Governing Professional Training and Research

There are the laws meant to regulate the standards of professional education and training of doctors, nurses, technician and controlling research activities. These laws are listed in Table 9.

**Table 9:** Laws governing professional training and research

1. MCI rules for MBBS, PG and internship training
2. National board of examination rules for DNB training
3. ICMR rules governing medical research
4. NCI rules for nursing training
5. Ethical Guidelines for Biomedical Research on Human Subjects, 2000

### Laws Governing the Business Aspects

Some rules are applicable to hospital in relation to its business aspects. These are listed in Table 10.

**Table 10:** Laws governing the business aspects

1. Cable Television Network Act 1995
2. Charitable and Religious Trusts Act 1920
3. Contracts Act 1982
4. Copyright Act 1982
5. Custom Act 1962
6. FEMA 1999
7. Gift Tax Act 1958
8. Income Tax Act 1961
9. Insurance Act 1938
10. Sales of Good Act 1930

### Licences/Certifications Required for Hospitals

A hospital administrator should be aware about the licences that are essentially required and to renew them as and when required. These are as listed in Table 11.

**Table 11:** Licences/certifications required for hospitals

Sr. no.	Licences/certifications	Frequency
1.	Registration under societies registration act	Initially
2.	Inspection for electrical installation/ substation	Initially
3.	NOC from local municipal office for any bye law	Initially
4.	Licence for storage of petrol/diesel on form XV under the petroleum rules 2002	2 yearly
5.	Income tax exemption certificate	3 yearly
6.	NOC from Delhi fire services	Before implementation
7.	Registration for operation of X-ray installation with AERB	Every 2 years
8.	Drug Licence for medical store, IPD pharmacy, OPD pharmacy	Every 5 years
9.	Licence to operate blood bank under rule 122G of drug and cosmetic act	Every 5 years
10.	Registration under PNDDT Act 1994	Every 5 years
11.	Income tax registration/PAN	Once only
12.	Registration for VAT/Sales tax	Once only
13.	Registration for EPF	Once only
14.	Registration for ESI coverage of employee	Once only
15.	Registration under rule 34, sub rule (6) of MTP Act 1971	One time registration
16.	Registration under Delhi nursing Home Act 1953	Yearly
17.	Indemnity insurance policy	Yearly
18.	Standard fire and special perils policy	Yearly
19.	Authorization for generation of BMW under BMW handling rule 1996	Yearly renewal
20.	Licence for operating lift under Sect 5 and 6 and Rules 4 and 5 (inspector of lift, state govt)	Yearly renewal

### Periodic Reports and Returns as Legal Commitment

A hospital administrator should be aware about the reports and returns that are essentially required by different agencies with fixed periodicity. Some of these are listed in Table 12.

**Table 12:** Periodic reports and return as legal commitment for hospitals

Sr. no.	Periodic reports and return for hospitals	Frequency
1.	Biomedical waste generation	Annual
2.	Income Tax	Annual return
3.	Units processed in blood bank	Monthly
4.	MTP reports	Monthly
5.	PNDDT report (prenatal USG done)	Monthly
6.	Employees provident fund	Monthly/annual
7.	ESI act	Monthly/annual
8.	VAT	Monthly/quarterly online
9.	Registration of births and deaths	On every occurrence
10.	Post polio paralysis case	On every occurrence
11.	Communicable disease report	On every occurrence
12.	Radiologist registration under PNDDT	On induction of a new radiologist
13.	USG machine registration under PNDDT	On induction of each machine
14.	Needle stick injuries	On occurrence
15.	TLD Badges for monitoring the dosage received	Quarterly
16.	TDS	Quarterly

### CONCLUSION

The health legislations are very few as compared to the size and problems in the health care sector. There is a need for having a comprehensive health care act, framed in order to gear the entire health care sector to the objectives laid down in the different policy in India. Most of the common medico legal situations arise out on noncompliance with these rules and regulations. If a hospital or doctor acquaints well with these rules and regulations and follows them sincerely, he/she would be on the right side of the law.

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# Use of Checklist Prevents Errors during Surgeries

<sup>1</sup>Jatin Kumar, <sup>2</sup>Akash Sud

## ABSTRACT

'Hospitals do most of the right things, on most patients, most of the time.

The checklist helps them to do all the right things, on all patients, all the time.'

According to International Patient Safety Goal-4 (IPSG-4), the hospitals need to ensure the correct patient, correct site, correct procedure and correct surgery. WHO launched Safe Surgery Saves Lives program in 2009 to reduce the number of surgical deaths across the globe. In the complex setting of an operating room, any of the steps may be overlooked during the fast-paced preoperative, intraoperative, or postoperative preparations. So a customized checklist was introduced after sensitization and training of all OT users to reinforce accepted safety practices and foster better communication and team work between clinical disciplines. The aim of the checklist is to reduce the number of errors during surgery and to reduce postoperative complications. The use of the checklist reduced the rate of deaths and complications by more than one-third. The rate of major inpatient complications dropped from 11 to 7%, and the inpatient death rate following major operations fell from 1.5 to 0.8% after implementation of the checklist. Audit tool printed at the backside of the checklist is analyzed every month, to observe the shortcomings.

**Keywords:** Surgery, Patient safety, Safe surgery checklist, IPSG 4.

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## INTRODUCTION

Surgical care and its safe delivery affect the lives of millions of people. About 234 million major operations are performed worldwide every year and >1 million of these individuals die from complications. Surgical care has been an essential component of health care worldwide. There are 3 central problems in surgical safety—unrecognized as a public health issue, lack of data on surgery and outcomes and Failure to

use existing safety know-how. As the incidences of traumatic injuries, cancers and cardiovascular disease continue to rise, the impact of surgical intervention on public health systems will grow. There are between 1500 and 2500 wrong site surgery incidents every year in the US.<sup>6</sup> In a survey of 1050 hand surgeons, 21% reported having performed wrong-site surgery at least once in their career.<sup>6</sup>

To assist operating teams in reducing the number of these events, WHO Patient Safety—in consultation with surgeons, anesthetists, nurses, patient safety experts and patients around the world—has identified ten essential objectives for safe surgery.<sup>1</sup> They are:

- (1) Operate on the correct patient at the correct site.
- (2) Use methods known to prevent harm from administration of anesthetics, while protecting the patient from pain.
- (3) Recognize and effectively prepare for life-threatening loss of airway or respiratory function.
- (4) Recognize and effectively prepare for risk of high blood loss.
- (5) Avoid inducing an allergic or adverse drug reaction for which the patient is known to be at significant risk.
- (6) Consistently use methods known to minimize the risk for surgical site infection.
- (7) Prevent inadvertent retention of instruments or sponges in surgical wounds.
- (8) Secure and accurately identify all surgical specimens.
- (9) Effectively communicate and exchange critical information for the safe conduct of the operation.
- (10) Hospitals and public health systems will establish routine surveillance of surgical capacity, volume and results.

The checklist identifies three phases of an operation, each corresponding to a specific period in the normal flow of work: before the induction of anesthesia ('sign in'), before the incision of the skin ('time out') and before the patient leaves the operating room ('sign out'). In each phase, the circulating nurse must confirm that the surgery team has completed the list.<sup>1,4</sup>

## MATERIALS AND METHODS

Execution of a customized version of WHO Safe Surgery checklist in all OTs was planned. Training programs for all the surgical staff was planned. A Steering Committee comprising of surgeons, anesthetists, technician, nurses, administration and quality department was formed which later transformed into implementation team. Role of implementation team was divided into 3 broad categories modification of current checklist, awareness and training, retrospective

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and prospective data collection. The surgical safety culture survey forms were circulated to all the OT personnel. Filled forms were collected, analyzed and discussed. It was decided that safe surgery checklist to be considered as a continuous quality improvement tool outside the medical record. Next an online survey was conducted for the staff that missed the first round of survey. Training of nurses, technicians, surgeons and anesthesiologists were conducted. Small group sessions with individual departments were planned. Also 'Incident Report Committee' was reconstituted. A list of possible postsurgical complications were prepared which included 30-day mortality, postoperative blood transfusion of 4 or more units within 72 hours, pulmonary embolism, stroke, infection of surgical site,<sup>7</sup> cardiac arrest requiring CPR, myocardial infarction, major disruption of wound, unplanned return to OR, coma of >24 hours, unplanned intubation, sepsis/septic shock/SIRS, acute renal failure, ventilator use for 48 hours or more, VAP, vascular graft failure.

In order to implement the checklist during surgery, a single person must be made responsible for performing the safety checks on the list. It was decided that this designated checklist coordinator will often be a circulating nurse.

The checklist divides the operation into three phases, each corresponding to a specific time period in the normal flow of a procedure—the period before induction of anesthesia, the period after induction and before surgical incision, and the period during or immediately after wound closure but before removing the patient from the operating room. In each phase, the checklist coordinator must be permitted to confirm that the team has completed its tasks before it proceeds onward. As operating teams become familiar with the steps of the checklist, they integrate the checks into their familiar work patterns and verbalize their completion of each step without the explicit intervention of the checklist coordinator. Each team seek to incorporate use of the checklist into its work with maximum efficiency and minimum disruption while aiming to accomplish the steps effectively.

All steps to be checked verbally with the appropriate team member to ensure that the key actions have been performed. Therefore, before induction of anesthesia, the person coordinating the checklist verbally review with the anesthetist and patient (when possible) that patient identity has been confirmed, that the procedure and site are correct and that consent for surgery has been given. The coordinator will visualize and verbally confirm that the operative site has been marked (if appropriate) and will review with the anesthetist the patient's risk of blood loss, airway difficulty and allergic reaction and whether an anesthesia machine and medication safety check has been completed. Ideally the surgeon be present during this phase as the surgeon may have a better

idea of anticipated blood loss, allergies, or other complicating patient factors. However, the surgeon's presence is not essential for completing this part of the checklist.

Before skin incision, each team member introduces him or herself by name and role. If already partway through the operative day together, the team can simply confirm that everyone in the room is known to each other. The team confirms out loud that they are performing the correct operation on the correct patient and the correct site and then verbally review with one another, in turn, the critical elements of their plans for the operation, using the checklist for guidance.

They also confirm that prophylactic antibiotics have been administered within the previous 60 minutes and that essential imaging is displayed, as appropriate. Before leaving the operating room, the team reviews the operation that was performed, completion of sponge and instrument counts and the labeling of any surgical specimens obtained. It also reviews any equipment malfunctions or issues that need to be addressed. Finally, the team discusses key plans and concerns regarding postoperative management and recovery before moving the patient from the operating room.

Having a single person leading the checklist process is essential for its success. In the complex setting of an operating room, any of the steps may be overlooked during the fast-paced preoperative, intraoperative, or postoperative preparations. Designating a single person to confirm completion of each step of the checklist can ensure that safety steps are not omitted in the rush to move forward with the next phase of the operation. Until team members are familiar with the steps involved, the checklist coordinator will likely have to guide the team through this checklist process.

A possible disadvantage of having a single person lead the checklist is that an antagonistic relationship might be established with other operating team members. The checklist coordinator can and should prevent the team from progressing to the next phase of the operation until each step is satisfactorily addressed, but in doing so may alienate or irritate other team members. Therefore, hospitals must carefully consider which staff member is most suitable for this role and empower the designated staff.

## RESULTS AND ANALYSIS

The goal of checklist is not role recitation or to frustrate workflow. The checklist is intended to give teams a simple, efficient set of priority checks for improving effective teamwork and communication and to encourage active consideration of the safety of patients in every operation performed. In a survey of 100 (30 doctors, 40 nurses,

30 technicians), 78.6% mentioned the checklist was easy to use. 79.2% says the checklist has improved operating room safety while 21% are not sure and 18.3% say the checklist takes a long time to complete. 84.3% says communication has improved through use of the checklist. Finally 78.2% say, If I were to be operated, I would surely want the checklist to be used.

Wrong site draped in one surgery, radial pack gauze missing, graft size not prepared, blood not arranged for a surgery, allergy not mentioned in preoperative checklist and evaluation form, antibiotic prophylaxis not given before time out, before sign in, the need to secure central IV access not evaluated, are among the few errors prevented by the use of the checklist. Doing this has improved the chances of detection of possible errors and has helped the unit in implementing timely interventions to prevent serious outcomes. Hence the checklist solves two purposes: ensuring consistency in patient safety and introducing (or maintaining) a culture that values achieving it.

### Impact on Financials

Implementation of checklist leads to: (1) less SSI due to timely administered of antibiotics, 1 hour prior to surgery,<sup>8,9</sup> (2) decreased ALOS, (3) decreased rate of return to OT, (4) elimination of error mitigates chances of litigation and compensation.

### Impact on Patients

(1) Financial savings due to decrease ALOS on account of decrease complications, decrease SSI, decrease duration of surgery. (2) Better outcome on account of (a) better planning, safer anesthesia, (b) timely administration of correct medication and elimination of errors and (3) patient safety.

### Impact on Employees

(1) Team work and better communication, (2) smoother and quicker processes, (3) decreased turnaround time, (4) skill enhancement, (5) improved staff morale and (6) secure working environment.

To build a culture of safety in our health care organizations, health care leaders must ensure that, in their organizations, 'incidents', such as surgical mishaps must be routinely reported without the fear of unjust retribution on the part of the unfortunate healthcare worker. When people are not afraid to report adverse incidents because of the existence of a 'just culture' where, when things go wrong, no one is immediately assigned blame (blame culture), only then will we be able to collect accurate and honest data about incidents, analyse them and learn important lessons from

them and, in the process, improve our systems and processes so that the care that we provide will be safer.<sup>3</sup>

## DISCUSSION

The checklist should be modified to account for differences among facilities with respect to their processes, the culture of their operating rooms and the degree of familiarity each team member has with each other. However, removing safety steps because they cannot be accomplished in the existing environment or circumstances is strongly discouraged. The safety steps should inspire effective change that will bring an operating team to comply with each and every element of the checklist.

Modification of the checklist should be undertaken with a critical eye. Surgeons, anesthetists, and nurses should be involved in the modification process and the resulting checklist tried in simulated and real-life situations in order to ensure its functionality.<sup>2</sup> Actively seeking inputs from nurses, anesthetists, surgeons and others is important not only in helping to make appropriate modification but also in creating the feeling of 'ownership' that is central to adoption and permanent practice change.

Monitoring and evaluation of outcomes is an essential component of surgical care. Many facilities and departments already engage in this process; additional data collection is neither recommended nor encouraged if such a system is already in place and proves useful to the clinicians and staff as a means of improving the quality of care. However, in hospitals where results of surgical care are not routinely tracked and postoperative complications are not recorded, or where surveillance mechanisms are not sufficient to identify poor practices, patient safety checklists become law in Nevada. Now government is picking up the baton.

## CONCLUSION

The aim of this checklist is to reinforce accepted safety practices and foster better communication and teamwork between clinical disciplines.<sup>5</sup> The checklist is intended as a tool for use by clinicians interested in improving the safety of their operations and reducing unnecessary surgical deaths and complications. Advantages of using a checklist are customizable to local setting and needs, Deployable in an incremental fashion, Supported by scientific evidence and expert consensus, Evaluated in diverse settings around the world, Ensures adherence to established safety practices, minimal resources required to implement a far-reaching safety intervention.

The goal of the surgical safety checklist is to help insure that teams consistently follow critical safety steps and thereby minimize the most common and avoidable risk that

endanger lives and safety of surgical patients. It evaluates the current state of safety practices and standards at our facility and identifies area for improvement.

Use of the surgical safety checklist has demonstrably improved compliance with basic standards of surgical care in diverse hospitals around the world. While the relationship between adherence to standards and decreases in complication rates is likely multifactorial, improving the safety and reliability of surgical care can save lives and promote confidence in the health system.

Leave aside the other advantages, if 2 minutes taken to read aloud one sheet of paper could prevent wrong surgeries (both on wrong patients and on wrong site), it would be more than worth its weight in gold. The moral, legal and financial cost of wrong surgery is unquantifiable.

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## CASE REPORT

# Break-Even Analysis in Healthcare Setup

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## INTRODUCTION

Break-even analysis is the use of a simple mathematical formula to determine the sales level at which the business is neither incurring a loss nor making a profit. In other words, when the firm's total expenses equal its net sales revenue that is the break-even point for the operation.<sup>1</sup>

The break-even point (BEP) is, in general, the point at which the gains equal the losses. A BEP defines when an investment will generate a positive return or also the point where total costs equal total revenues. There is no profit made or loss incurred at the break-even point. This is important for anyone who manages a business, since the BEP is the lower limit of profit when prices are set and margins are determined.

Break-even analysis, sometimes called cost-volume-profit analysis, is an important analytical technique used to study relations among costs, revenues and profits. Both graphic and algebraic methods are employed. For simple problems, simple graphic methods work best. In more complex situations, analytic methods, possibly involving spreadsheet software programs are preferable.

Defining the break-even point in mathematical terms is simply the point where:

$$\text{Total expenses} = \text{Net sales revenue}$$

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The amount of sales revenue should be readily available on income as 'Net Sales'. Net sales revenue is all sales revenue (often called gross revenue) less any sales returns and allowances or sales discounts.

The break-even point represents the level of revenue that equals the total of the variable and fixed costs for a given volume of output service at a particular capacity use rate. Other things being equal, the lower the break-even point, the higher the surplus and the less the operating risk. The BEP also provides nonprofit managers with insights into surplus/deficit planning.

The following case studies will elucidate the concept of break-even analysis.

## CASE REPORTS

### Case 1

A hospital is offering laparoscopic cholecystectomy at a package deal with a selling price ₹ 30,000/- per operation and the variable cost per operation comes out to be ₹ 20,000/-. The annual fixed cost is ₹ 60,00,000/-. How many laparoscopic operation the hospital must do to come at BEP.

#### Solution

Total fixed cost = ₹ 60,00,000

Unit selling price = ₹ 30,000

Unit variable cost = ₹ 20,000

Unit contribution = unit selling price - unit variable = 30,000 - 20,000 = 10,000

Therefore, BEP (units) = 60,00,000/10,000 = 600 numbers of laparoscopic operation.

Thus, a minimum number of 600 operations must be done so that the hospital achieves break-even point.

### Case 2

An X-ray center has priced its X-ray test and report for ₹ 200/- each. The variable cost is ₹ 100/- per test. The annual fixed cost is ₹ 2,00,000/-. Find out the number of X-ray tests to be performed per year for BEP to be achieved.

#### Solution

Total fixed cost = ₹ 2,00,000

Unit selling price = ₹ 200

Unit variable cost = ₹ 100

Therefore, BEP (units) = 200,000/(200-100) = 2000.



Thus, a minimum of 2000 X-ray tests must be carried out so that the X-ray center breaks even.

Thus, break even analysis in an institution leads to a point where there is no profit or loss, i.e. where revenue and expenditure match. In public sector hospitals this sort of analysis is usually not done as there is no such pressing requirement. In private hospitals this has to be made. Otherwise the hospitals will not know whether that the hospital is making a profit or going in loss.

## DISCUSSION

Break-even analysis attempts to study the revenue and costs in relation to sales volume of a business unit and to determine that point where sales revenue just equals to total costs. The level of activity is generally termed as break-even point (BEP). At this point of activity (production/sales), a producer neither earns any profit nor incurs any loss. That is why it is also called as 'No Profit, No Loss Point', or 'Zero Profit and Zero Loss Point'. If sales exceed Break-even point, profit arises and if sales fall below break-even point, loss emerges. Thus break-even point is also known as point at which loss ceases and above which profit begins.

Break-even analysis assists the provider in predicting the volume of services that must be provided (and for which payment must be received) in order for the cost of providing the services to be equally matched by the payment received, yielding neither a profit nor a loss.

For the purpose of this analysis, the various costs are divided in two parts, i.e. fixed costs and the variable costs. The fixed costs are the costs that cannot be avoided and are essential for the business. These remain fixed irrespective of the changes in the volume, i.e. the numbers of units of goods produced such as rent, insurance, etc. Variable costs are costs that vary directly with the number of products produced. The difference between selling price per unit and variable cost per unit is called contribution per unit or simply unit contribution. The sum total of all unit contribution is called 'Total Contribution'. In BEP, the total contribution is equal to the fixed cost. Thus at break even point, the fixed cost has been overcome by the contribution and any further activity would have additional contribution to generate profit. In a break even analysis we would determine this point BEP.

Break-even analysis determines the service output at which total revenue will equal the total costs of an organization.<sup>2</sup>

Assuming that the output of services is 'x' and the price is 'p', then total revenue is 'xp'. If fixed costs are 'a', and 'b' is the variable cost per unit of service then the total costs are 'a + bx'. The algebraic expression of the break-even condition (total costs equal total revenues) will then be:

$$xp = a + bx \quad (1)$$

And, the BEP, i.e. the service output at which costs and revenues are equal, can be determined as:

$$x = a/(p - b) \quad (2)$$

Equations (1) and (2) hold true within the service output range for which the fixed costs and unit variable costs remain constant.

As long as 'p' is somewhat bigger than 'b' (i.e. the price is higher than the variable unit cost), so that at least some element of fixed costs is being covered, then, with each additional unit of service, the hospital makes a step toward its BEP. It will take the sale of a certain number of units of service to recover fixed costs. Beyond that number, each additional unit of service sold will generate a surplus of revenue over cost. Figure 1 provides a graphical illustration of the breakeven condition and point.<sup>2,3</sup>

Many organizations sell a combination of different products or services. The sales mix is the proportion of different products or services that an organization sells.

Most of the hospitals or clinics have more than one service. It may be possible to identify the specific fixed costs associated with each service, and so calculate each service's BEP. However, there would still be a core of fixed costs, such as the rent for the buildings and the salary costs of senior management, which cannot be allocated to individual service. If we are to discover the BEP for the whole firm we need to be able to:

- Combine all the fixed costs into a single pool.
- Obtain a surrogate for the contribution per unit that is used to calculate the BEP for a single service.

It will not be possible to use an average contribution per unit in those firms that produce service which are very different from each other. The calculation of a weighted average contribution per unit is time consuming so a surrogate is useful. Hospital is a service industries do not have tangible products, but the units of output can be identified which are connected to selling prices. A multi product/service organisation like hospital can compute its break-even point using the following formula:

$$\text{Break-even point} = \frac{\text{Total fixed expenses}}{\text{Weighted average selling price} - \text{weighted average variable expenses}}$$

For computing BEP of a company with two or more products/service, we must know the sales percentage of individual products/service in the total sales mix. This information is used in computing weighted average selling price and weighted average variable expenses.

In the above formula, the weighted average selling price is worked out as follows:

Sale price of product/service A  $\times$  sales percentage of product/service A + sale price of product/service B  $\times$  sale percentage of product/service B + Sale price of product/service C  $\times$  sales percentage of product/service C + ... and the weighted average variable expenses are worked out as follows:

Variable expenses of product/service A  $\times$  sales percentage of product/service A + Variable expenses of product/service B  $\times$  variable expenses of product/service B + variable expenses of product/service C  $\times$  sales percentage of product/service C + ...

When weighted average variable expenses per unit are subtracted from the weighted average selling price per unit, we get weighted average contribution margin per unit. Therefore, the above formula can also be written as follows:

$$\frac{\text{Total fixed expenses}}{\text{Weighted average contribution margin per unit}}$$

The hospital is a multiproduct/ service organization. Sustainable performance above the BEP depends on the sum of performances across many services and cost centers. Decline in the output of services in one clinical department will cause a shortfall of revenue that throws the facility left of the BEP and into deficit (Figure 1). The hospital will have to close the gap either by increasing reimbursable or budgeted activities in other revenue-earning cost centers, or by reducing costs in the intermediate cost centers (taking care not to jeopardize the quality of patient care). The break-even analysis shows the percent by which price and outputs should be increased in each final cost center (or costs should be reduced in each intermediate cost center) in order to restore the hospital to its BEP, for each percent revenue shortfall in a given revenue-earning cost center.

A basic break-even analysis chart composed of a firm's total cost and total revenue curves is depicted in Figure 1. Volume of output is measured on the horizontal axis; revenue and cost are shown on the vertical axis. Fixed costs are constant regardless of the output produced and are indicated by a horizontal line. Variable costs at each output level are measured by the distance between the total cost curve and the constant fixed costs. The total revenue curve indicates the price/demand relation for the firm's product; profits or losses at each output are shown by the distance between total revenue and total cost curves.

#### ADVANTAGES OF THE BREAK EVEN CHART<sup>4,5</sup>

1. It serves as a useful tool of planning and control.
2. It is useful tool to study the feasibility of acquiring the equipment.

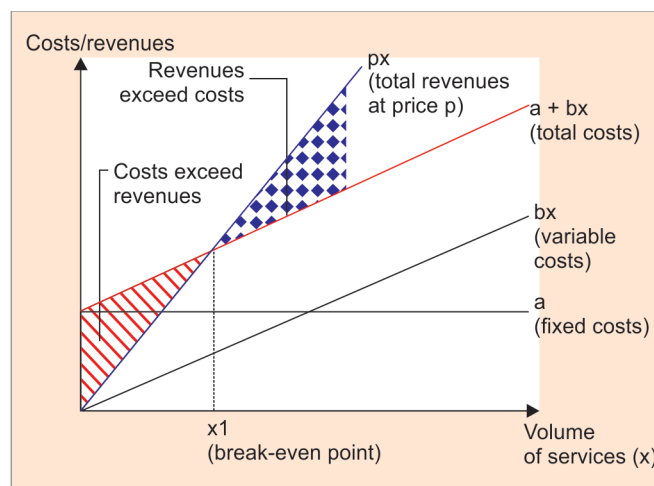


Fig. 1: Break-even analysis

3. It helps to explain relations among volume, prices and costs. It is also useful for pricing, cost control and other financial decisions.
4. It's practical implications are profit estimation at the different levels of activity, ascertaining turnover for desired profit.
5. The main advantage of break-even analysis is that it explains the relationship between cost, production volume and returns. It can be extended to show how changes in fixed cost-variable cost relationships, in commodity prices, or in revenues, will affect profit levels and BEP.
6. Break-even analysis is most useful when used with partial budgeting or capital budgeting techniques.
7. The major benefit to using break-even analysis is that it indicates the lowest amount of business activity necessary to prevent losses.

#### LIMITATIONS OF BREAK-EVEN ANALYSIS

1. It is best suited to the analysis of one product at a time.
2. It may be difficult to classify a cost as all variable or all fixed.
3. There may be a tendency to continue to use a break-even analysis after the cost and income functions have changed.
4. It ignores the price and technology changes and efficiency.<sup>6</sup>

#### CONCLUSION

Break-even analysis is a simple tool for financial analysis so as to make a right decision in business proposals when more than one alternative is available. The break-even analysis is most commonly used to do the cost volume profit analysis. It indicates the level of sales at which the total revenues are

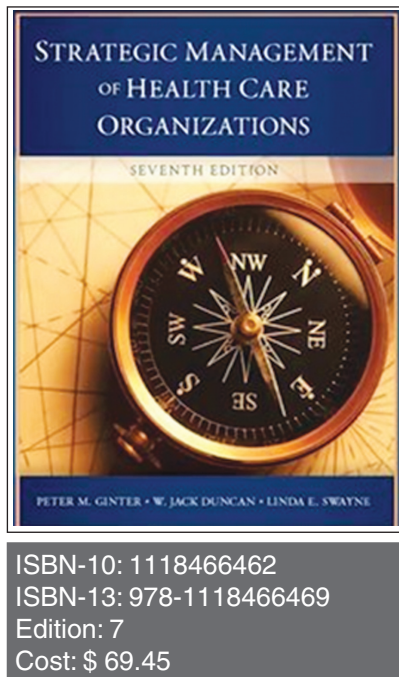
equal to the total costs. For every unit of goods produced the sale/activity generates revenue and the difference of the price minus variable cost is called unit contribution.<sup>7,8</sup>

It is an efficient and effective method of financial reporting and planning and easily understood by the senior executives when compared to accounting data.<sup>9</sup>

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# Book Review



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## Reviewed by

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## THE STRATEGIC MANAGEMENT OF HEALTH CARE ORGANIZATIONS

The book 'The Strategic Management of Health Care Organizations' aims to provide a structured strategic management approach is what's needed to tackle the revolutionary change the healthcare system has been experiencing. Today, health-care organizations have almost universally embraced the strategic perspective first developed in the business sector and now have developed strategic management processes that are uniquely their own. Healthcare leaders have found that strategic thinking, planning and managing strategic momentum are essential for coping with the dynamics of the healthcare industry. Strategic management has become the single clearest manifestation of effective leadership of healthcare organizations. It is a multiauthored and multidisciplinary integrated book on the subject.

The 7th edition of this leading text has been revised and updated to include a greater focus on the global analysis of industry and competition and analysis of the internal environment.

The book deliberates on all aspects of strategic planning, analysis of the health services environment (both internal and external) and lessons on implementation. It also looks at organizational capability, sustainability, CSR and the sources of organizational inertia and competency traps. There is a greater focus on the global analysis of industry and competition and analysis of the internal environment. In consultation with feedback from their adopters, the authors have concentrated on the fundamentals of strategy analysis and the underlying sources of profit. This reflects waning interest among senior executives in the pursuit of short-term shareholder value.

The book will be a ready-reckoner for administrators, clinicians and practitioners in healthcare facilities for policy making, formulation of standard operative procedures, implementing techniques and processes for strategic planning in healthcare.

As ever, students are provided with the guidance they need to strategic planning, analysis of the health services environment (internal and external) and lessons on implementation, with additional discussion on organizational capability, deeper treatment of sustainability and corporate social responsibility and more coverage of the sources of organizational inertia and competency traps.



This edition is rich in new examples from real-world healthcare organizations. Chapters are brought to life by the 'Introductory Incidents', 'Learning Objectives', 'Perspectives', 'Strategy Capsules', useful chapter summaries and questions for class discussion. All cases and examples have been updated or replaced. In this edition, the teaching materials and web supplements have been greatly enhanced, with power-point slides, to give lecturers a unique resource.

This is an outstanding book. While naturally oriented to strategic management of healthcare it is also a comprehensive framework to strategic management in general. The book's layout is that of a university textbook but it is also written in an enjoyable style. I read this book as a practitioner and not a formal student and found it extremely readable and helpful. The authors present both conceptual and practical tools for strategic management.

The book has 10 chapters, covered in 451 pages with a large number of illustrations.

There is a comprehensive bibliography and glossary at the end of book that adds value to its subject.

# MCQs in Management and Healthcare Administration

1. Planning a new hospital starts with setting goals for the hospital, without which the organization cannot have a definite direction or focus. Which of the following areas is not considered by an organization while studying existing hospital facilities in an area?
  - (a) Bed ratio
  - (b) Hospital occupancy
  - (c) Physical condition of facilities
  - (d) Volume of services provided
  - (e) Perception of patients
2. Centralization principle of management science has brought the existence of central sterile services department (CSSD) in large hospitals. The significance of CSSD is:
  - (a) To bring advancement in medical science to provide betterment of humanity
  - (b) To help the doctors to develop leadership qualities and human relationship abilities
  - (c) To bring efficiency and economy in the centralization of sterilization of syringes activity in one location for use all over the hospital
  - (d) To help nonmedical staff to learn administrative skills
  - (e) To help medical professionals to develop management attitudes.
3. There are various operational research models used in the areas of hospital and healthcare management. Which of the following models is used in the capital rationing of resources like budget allocation, transfer pricing, etc.?
  - (a) Assignment model
  - (b) Transportation model
  - (c) Dynamic programming model
  - (d) Sequencing model
  - (e) Linear programming model.
4. All drugs are classified individually on the basis of A-B-C, X-Y-Z, H-M-L, V-E-D, F-M-S and G-O-F analysis. The set of these six classifications, to which every item belongs, is then defined as a new category in the multiple basis approach to selective inventory control (MBASIC) system called classification-combination. Apart from this classification-combination, If nonmoving drugs (N) along with the drugs classified on the basis of value, unit price, consumption pattern and sources of supply are considered, the total number of possible classification combinations that can emerge is:
  - (a) 27
  - (b) 81
  - (c) 243
  - (d) 729
  - (e) 810.
5. A medical audit committee comprises professionals from different departments of a hospital. Which of the following may act only as an observer in committee meetings?
  - (a) Heads of medical departments
  - (b) Nursing superintendents
  - (c) Head of pathology
  - (d) Director of medical services
  - (e) Administrator.
6. A hospital is a vital organization and stands unique and incomparable to any other organization. Which of the following is considered important part of new hospital plan, not only for aesthetics and access, but also to utilize the potential to capture or avoid natural energy?
  - (a) Provision for disasters
  - (b) Functional requirements
  - (c) Future expansion
  - (d) Environmental impact analysis
  - (e) Citing and orientation.
7. Which of the following is determined by calculating deaths after 24 hours of hospital admission?
  - (a) Gross death rate
  - (b) Random death rate
  - (c) On-the-spot death rate
  - (d) Net death rate
  - (e) Chronic death rate.
8. Harrison suggested different methods of monitoring of medical audit. Which of the following method of monitoring is based on the primary idea of learning from mistakes?
  - (a) Peer review
  - (b) Sentinel cases
  - (c) Criterion-based audit
  - (d) Surveys
  - (e) Comparison of the small groups in the same field.
9. Laboratory and diagnostic services are of paramount importance in a hospital because
  - (a) The relationship formed at this stage go a long way in building overall image of the hospital
  - (b) This stage forms the initial contact point between patient and the hospital
  - (c) Any amount of effort expended at this stage is less, unless one can delight the patient
  - (d) They properly receive the patients and brief them about the investigations
  - (e) Their indirect interaction also has a definite bearing on the final outcome of the patients satisfaction.
10. A hospital requires to check and understand the applicability of the standard clauses for the institution. In India, all the hospitals have been certified for
  - (a) ISO 9000
  - (b) ISO 9001
  - (c) ISO 9002
  - (d) ISO 9003
  - (e) ISO 9004

# Answers of MCQs in Management and Healthcare Administration

**Q. 1. Answer: e**

An organization considers following points while studying existing hospital facilities in an area:

- Bed ratio
- Hospital occupancy
- Physical condition of facilities
- Volume of services provided.

**Q. 2. Answer: c**

The significance of Central Sterile Services Department (CSSD) is to bring efficiency and economy in the centralization of sterilization of syringes activity in one location for use all over the hospital. Hence, option (c) is the correct answer.

**Q. 3. Answer: e**

Linear programming model is used in capital rationing of resources, budget allocation, transfer pricing, etc. Hence, option (e) is the correct answer.

**Q. 4. Answer: e**

All drugs are classified individually on the basis of A-B-C, X-Y-Z, H-M-L, V-E-D, F-M-S and G-O-F analysis. The set of these six classifications, to which every item belongs, is then defined as a new category in the multiple basis approach to selective inventory control (MBASIC) system called classification-combination. The total number of classification combinations that can emerge is  $sn$ , where:

$s$  = the number of categories in each selective control technique

$n$  = the number of selective control techniques

In the present study,  $n = 6$  and  $s = 3$

The total number of classification will be  $3^6 = 729$ .

Nonmoving drugs classified on the basis of value, unit price, consumption pattern and sources of supply are classified as four types, such as A-B-C, H-M-L, F-M-S and G-O-F. Each classification is having three categories. The classification-combination will be  $(n = 4, s = 3) = 81$ . The total number of possible classification-combination is  $729 + 81 = 810$ .

Hence, option (e) is the correct answer.

**Q. 5. Answer: e**

Administrators may act only as an observer in committee meetings, if they do not have a medical background. Hence, option (e) is the correct answer.

**Q. 6. Answer: e**

Citing and orientation is considered an important part of a new hospital plan, not only for aesthetics and access but also to utilize the potential to capture or avoid natural energy. Hence, option (e) is the correct answer.

**Q. 7. Answer: d**

Net death rate is determined by calculating deaths after 24 hours of hospital admission. Hence, option (d) is the correct answer.

**Q. 8. Answer: a**

Peer review is a method of monitoring based on the primary idea of learning from mistakes. Hence, option (a) is the correct answer.

**Q. 9. Answer: d**

Laboratory and diagnostic services are of paramount importance in a hospital because they properly receive the patients and brief them about the investigations. Hence, option (d) is the correct answer.

**Q. 10. Answer: c**

In India, all the hospitals have been certified for ISO 9002. Hence, option (c) is the correct answer.

# Recent Updates

## (News in Healthcare Sector)

### **Philips released Two New DICOM Compliant Clinical Review Displays at InfoComm 2013 in June**

Designed for everyday clinical environments, the 24- and 27-inch LCD monitors offer anti-microbial housing to inhibit bacterial growth, a medical grade power supply to ensure safety and low emission, and D-image preset for consistent DICOM grayscale medical images. Designed to complement clinical environments, the Philips 24-inch and 27-inch clinical review displays help ensure that medical images are shown consistently with high quality to achieve reliable interpretations. The rendering of medical grayscale images on standard monitors is mostly inconsistent at best, making them unsuitable for usage in a clinical environment. Philips clinical review displays with clinical D-image preset are factory calibrated to give DICOM part 14 compatible grayscale standard display performance. By using high quality LCD panels with LED technology, Philips aims to offer consistent and reliable performance at an affordable price point. Priced at \$899 and \$1,099, the Philips Brilliance LCD Monitors with Clinical D-image will be available soon to enterprise buyers through CDW and other resellers.

### **Toshiba showcases New MR Smart Fusion Ultrasound Technology**

Toshiba America Medical Systems, Inc., has extended Aplio 500's Smart Fusion ultrasound technology to MR. Smart Fusion syncs previously acquired CT or MR images with live ultrasound and displays them side-by-side on a single screen. This technology helps to locate hard-to-find lesions and aids in ultrasound-guided procedures without additional CT fluoroscopy or MR scans. Toshiba's Smart Fusion is easy to use, with the most intuitive user setup available.

### **Frost and Sullivan presents Carestream with 2013 Asia Pacific Market Leadership Award**

Frost and Sullivan has recognized Carestream Health for market growth with its 2013 Asia Pacific Market Penetration Leadership Award for the Digital and Computed Radiography Market. Frost and Sullivan presents this award to the company that has demonstrated excellence in capturing the fastest rate of change of market share within its industry from 1 year to the next. The award recognizes how fast a company increases its penetration of a market relative to its competitors, in terms of revenues or units, and is a measure of its success in taking market share away from its competitors from 1 year to the next. For more information, please visit [www.carestream.com](http://www.carestream.com).

### **Philips and Vidyo introduce Next Generation Telehealth Services**

Royal Philips Electronics and Vidyo are collaborating to offer health system providers an approach for extending telehealth solutions across the enterprise. Next generation telehealth services will require scalable and flexible advanced video technology to adapt to the full range of clinical work stations and mobile devices such as smartphones, tablets and laptops. 'Philips is committed to working with industry leaders to better address healthcare needs by expanding telehealth services beyond the ICU, as well as externally to remote clinics 'physician offices and into the home.'

### **Maquet Installs Hybrid OR with Siemens Angiography System**

Physicians, hospital administrators and hospital design engineers can obtain comprehensive information about current solutions available for interdisciplinary patient care with the opening of the new hybrid OR at the Surgical Academy in Rastatt. While the hybrid OR was primarily utilized for cardiovascular procedures, it can now be used in disciplines, such as neurosurgery, orthopedics, trauma surgery and urology. 'Hybrid operating rooms are most cost-effective when they are able to be used by various disciplines, for cardiovascular surgery as well as for normal OR operation, resulting in maximum utilization while minimizing downtime,' said Klaus Christian, Global Project Manager for Hybrid ORs at Maquet.

### **Telemedicine Equipment Revenues Grow 237%**

The telemedicine patient monitoring market grew from \$4.2 billion in 2007 to a value of more than \$10 billion dollars in 2012, according to Kalorama Information. The healthcare market research publisher said that while the market is small,



it is fast growing with a large amount of competitors and increasing awareness of effectiveness. The finding was made in Kalorama Information's newly published report, 'Advanced Patient Monitoring Systems.'

### **PSM India Initiative brings Together Government, Industry and Healthcare Stakeholders to help to stop the Spread of Spurious Medicines**

The partnership for safe medicines (PSM) India Initiative, a public health organization dedicated to protecting consumers from spurious and not-of-standard medicines, recently hosted its second event in less than a week to discuss near-term solutions that help train healthcare professionals, patients, consumer groups and other stakeholders throughout India and beyond. 'The people of India who are not aware of the medicine they are taking should know the quality and where it comes from,' said Sri UT Khader, Honourable Health Minister, Karnataka, at Friday's event in Bengaluru. 'They should know what they are consuming.' 'We have to empower the consumers,' said Dr GN Singh, DCGI, Govt of India. 'Let there be light and let people be empowered. That is the India we are seeking today' Guest speakers at this forum included, Mr CP Singh, IAS, Chairman, NPPA; Dr VG Somani, Joint Drugs Controller India, Dr Surinder Singh, Director I/C National Institute of Biologicals, Mr Mahesh Zagade, IAS, FDA Commissioner, Government of Maharashtra, Dr Sanjay Oak, Vice Chancellor, DY Patil Medical University, Mumbai, and Dr Pervez Ahmed, a leading Private Sector Healthcare Provider and Vice Chairman, PSM India Initiative.

### **College of American Pathologists along with BD Announce Strategic Alliance to support Laboratory Quality and Performance in India**

With the aim to provide quality diagnosis and better treatment outcomes for patients, the College of American Pathologists (CAP), the world leader in laboratory quality assurance and improvement and BD Diagnostics, a segment of BD (Becton, Dickinson and Company), a leading global medical technology company, recently announced the launch of a new strategic alliance that would help more pathology labs in the country to offer high quality services at par with the rest of the world. Having operated in India since 1996 supporting public and private sector partners in enhancing laboratory standards, BD has extensive experience in deploying clinical expertise and educational resources, as well as a deep understanding of the unique needs of laboratories in the country. In India, of the 71 laboratories participating in CAP PT, 42 have achieved CAP-accreditation. BD's access and logistics experience will support CAP PT importation and ensure more timely delivery and quality, reduce participants' administrative work, and allow billing in local currency. Market launch of this initiative will begin in India in August 2013 with PT distribution initiated in January 2014.

### **Fortis Sells Entire Stake in Vietnam Hospital Chain**

With reference to the earlier announcement dated June 11, 2013, intimating decision of Board of one of the Company's step down subsidiaries) based out of Singapore, i.e. Fortis Healthcare International Pvt Ltd., to divest its entire holding in Fortis Hoan My Medical Corporation, VOF PE Holding2 Limited and Swindon Limited subject to necessary regulatory approvals or otherwise to Viva Holdings Vietnam (Pvt) Ltd for an aggregate consideration of USD 80 mn (the transaction), Fortis Healthcare Ltd has announced that the transaction has been concluded on August 20, 2013.

### **The Food Security Bill, 2013**

The Food Security Bill is passed by Government of India and both house. The bill aims to provide subsidized foodgrain to around 67% of India's 1.2 billion people. As per the provisions of the bill, beneficiaries would get rice at INR 3/kg, wheat at INR 2/kg, and coarse grains at INR 1/kg. These rates would be valid for 3 years. Every pregnant woman and lactating mother would get free meal during pregnancy till 6 months after child birth. They will also get a maternity benefit of INR 6,000 in instalments. Children up to 14 years would get free meals. In case of nonsupply of foodgrains, states will have to pay food security allowance to beneficiaries. The bill was passed with rejecting more than 300 amendments in Lok Sabha on 26 August 2013.

### **Cabinet Clears Mental Healthcare Bill 2013**

The Union Cabinet on Thursday cleared the Mental Healthcare Bill 2013 that makes access to mental healthcare a right of all persons. Such services should be affordable, of good quality and available without discrimination, it said. The proposed law decriminalises suicide.

The bill, in consonance with international laws, has the provision of advance directives — described as a progressive and far-sighted step. No person who has recorded an advance directive to State that he or she should not be admitted to a facility without consent can be so admitted.

A rights-based bill also has a provision wherein a person with mental illness can appoint a nominated representative to take decisions for him or her. Under the provisions of the bill, government has an obligation to provide half way homes, community caring centers and other shelters for mentally ill people. This has been planned under the District Mental Health Programme in the 12th Plan.

In 2005, the National Commission on Macroeconomics and Health reported that 10 to 12 million or 1 to 2% of the population suffered from severe mental disorders, such as schizophrenia and bipolar disorder, and nearly 50 million or 5% from common mental disorders, such as depression and anxiety, yielding an overall estimate of 6.5% of the population.

The new bill, once approved by Parliament, will repeal the Mental Health Act 1987, which had vested extraordinary power in the hands of the treating psychiatrists. There was enough evidence of misuse and unscrupulous families collaborating with psychiatrists in addition to badly functional or nonfunctional central and mental health authorities primarily because of lack of funds.

# Forthcoming Events

## **Creating Excellence in the Healthcare Sector**

4th edition of Hospital Management Conference on 18th, 19th and 20th July 2014 . Alongside the exhibition is the HBI Middle East Congress, consisting of four conferences. The Healthcare Management, Leaders in Healthcare, Architects' Congress and Hospitals of the Future are the conferences planned for next year. To enquire about a conference or suggest any new topics for the future. For enquiries please contact the Hospital Build and Infrastructure Middle East Team on: Informa Life Sciences Exhibitions , Office No.: 20:01 , Level 20, Sheikh Rashid Tower, Dubai World Trade Centre, Dubai, UAE, Tel: +971 4 3365161, Fax: +971 4 3364021, e-mail: [hospitalbuild@informa.com](mailto:hospitalbuild@informa.com)

## **7th Annual Hospital Bed Management and Patient Flow Conference 2014**

27-28 February 2014 | Rydges Melbourne. Australia's foremost patient flow improvement conference, showcasing innovative case studies and pioneering best practice in the nation's hospitals. The program for IIR's 7th Annual Hospital Bed Management and Patient Flow Conference is currently in production: For Speaking Opportunities, please e-mail: [info@iir.com.au](mailto:info@iir.com.au). To request a copy of the brochure once finalized e-mail: [sean.barker@iir.com.au](mailto:sean.barker@iir.com.au). For sponsorship and exhibition opportunities, please e-mail Damian Dulanovic: [damian.dulanovic@iir.com.au](mailto:damian.dulanovic@iir.com.au)

## **Hospital Management Asia (HMA 2014)**

This is a conference dedicated to the entire spectrum of hospital management. Hospital Management Asia (HMA 2014) covers topics, such as managing patient safety, essential skills for hospital managers, predictive analysis and other breakthroughs, departmental operations efficiency, administration, quality management and customer service, management talent for healthcare managers, marketing, sales and pr for hospitals and clinical practice improvement. For more details, visit at: [www.hospitalmanagementasia.com](http://www.hospitalmanagementasia.com)

## **Hospital Build and Infrastructure Middle East 2014**

The region's largest event for investing in the future of healthcare infrastructure. Next year's event will take place from 2 to 4 June, 2014, at Dubai International Convention and Exhibition Centre. For scientific content and speaker details, please contact Dr Shilpa Mendon, Tel: +91-22- 6612 2675, Mobile: +91 98202 54009, e-mail: [shilpa.mendon@cims.co.in](mailto:shilpa.mendon@cims.co.in).