



# Making hospitals healthy – A need to look within

Improving and sustaining  
financial health through  
*cost efficiencies*

**EFFICIENCY**  
AND OPERATIONAL COST  
MANAGEMENT

**CHALLENGES  
IN ACUTE  
CARE AREAS**

September 2018

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# Preface

The world over, healthcare is going through some interesting and exciting times. There may not be any major economy in the world, which in recent times has not witnessed major deliberations around healthcare. Regulatory requirements, fierce competition, entry of non-traditional players, rising consumerism and rapidly emerging technologies are creating new opportunities and complexities for players operating in the sector. Further, continued growth in healthcare expenditures is putting more pressure on the current system and stressing on the need for change.

In India too, healthcare sector, particularly hospitals, are facing its own winds of change marked by government's impetus on improving affordability and safeguarding patient interests, a more informed and demanding consumer, increasing competition, and a pressing need to address trust deficit between patients and healthcare service providers.

Action on these front is being witnessed in varied ways – price controls by the government on drugs and medical implants, a shift in bargaining power towards institutional payers due to increasing insurance coverage and schemes like Aysuhman Bharat leading to predetermined and significantly discounted prices for treatment, reduced flexibility in pricing, and intense scrutiny on pricing of hospital services.

As a result, hospitals are facing the pressure not only on revenues, but also on margins and this pressure is only likely to continue if not further strengthen. In this scenario, the 'need to look within to be more cost efficient', without compromising on quality and safety, emerges as the most important imperative for the hospitals today.

Attaining cost efficiencies is not a one-time project. It is a continuous learning journey for the hospitals in how to be more cost-efficient by being able to persistently and sustainably self-analyse and self-evaluate.

In this report, we outline the key aspects of the journey which a hospital in pursuit of cost excellence should consider. For a new hospital being set-up, the report proposes that the journey start from planning of the hospital to be cost efficient – in terms of its design and choices related to capital costs such as medical equipment and their impact of operational costs. For existing operational hospitals, the report highlights three themes to achieve, enable and sustain cost efficiencies.

- 1. Achieve:** Cost transformation to achieve a new cost normal
- 2. Enable:** Implement changes to support cost efficiencies
- 3. Sustain:** Sustain cost efficiencies achieved and continue the improvement journey

Across these three themes, the report highlights many initiatives which have delivered results in many other hospital settings and also outlines the high level steps for a hospital to undertake them.

While significant opportunities exist across the hospital to reduce costs, intensive care settings and operating rooms, are two such areas which consume most resources – manpower, clinical expertise, drugs and medical consumables, and also present larger opportunities to reduce cost.

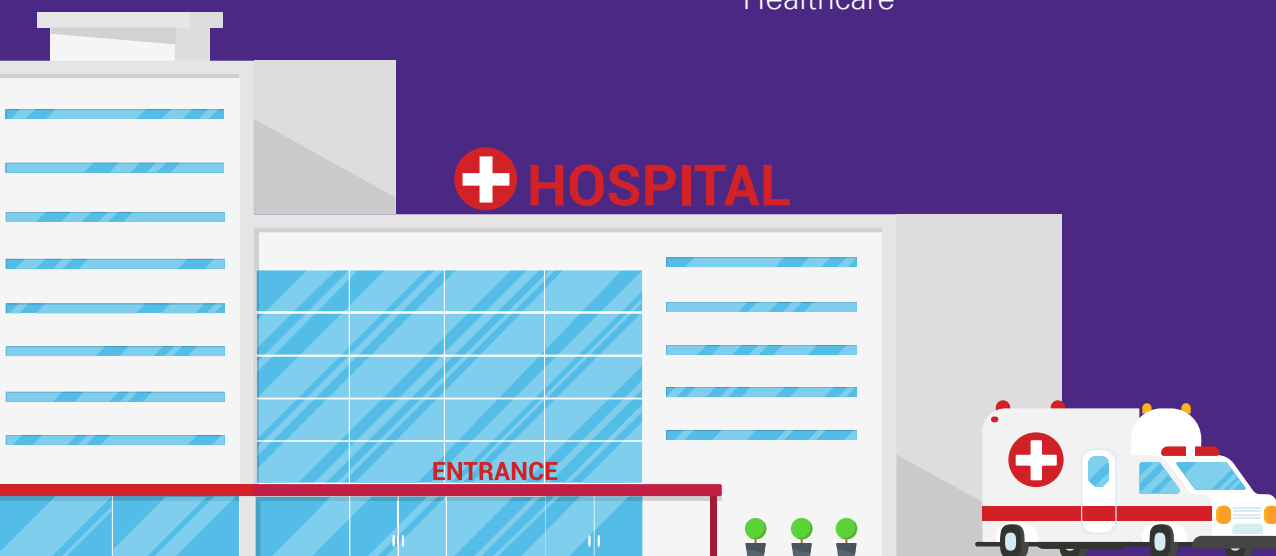
We are grateful to everyone who gave us time to discuss various aspects of this report and enrich our thoughts and contents of this report with their views and insights. We do hope that the report is able to nudge hospitals to take action and start their own journey towards sustainable cost efficiency.



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# Table of contents

<b>1. The imperative – need to look within</b>	<b>01</b>
<b>2. Where does the cost efficiency start?</b>	<b>07</b>
<b>3. The journey ahead</b>	<b>11</b>
<b>a. Achieve</b>	<b>13</b>
ii. Optimising resources	13
iii. Improving quality – a driver for cost efficiency	25
iv. Reducing variability	25
v. Asset sweating	26
<b>b. Enable</b>	<b>27</b>
iii. Implement service costing	27
iv. Incentivise cost efficiency	28
v. Leverage EMR and analytics	28
<b>c. Sustain</b>	<b>29</b>
ii. Monitor and manage	29
ii. Continuous improvement: Lean – the healthy way forward	30



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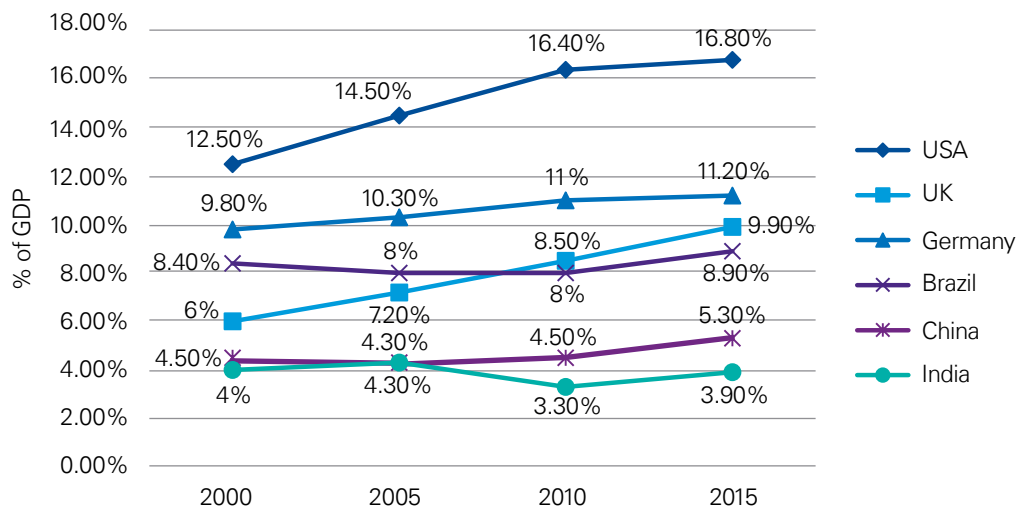
# The imperative – need to look within



Globally, the healthcare scenario is rapidly evolving. It is driven by an attempt to provide better coverage, ageing population burden, shifting disease profile, changing consumer expectations, newer treatments and advancements in technology. While the changes are manifesting in varied ways, one

critical challenge that most countries are facing is fiscal sustainability of healthcare systems. In many key economies, healthcare spending has outstripped economic growth, and has reached proportions where the funding pressures are being increasingly felt.

**Graph 1: Health expenditure as a percentage of GDP<sup>1</sup>**



1. KMPG in India analysis based on data sourced from The World Bank- Global Healthcare expenditure database, accessed on 10 Sept 2018;

Consequently, many countries have adopted different ways of curtailing the burgeoning expenditure to keep it at affordable levels. Some of these ways are:

- Promoting healthy behaviours such as changes in lifestyle, diet, habits
- Developing models for effective out-of-hospital care
- Shift towards value-based models for care delivery and procurement, supported by incentives to care providers
- Use of cheaper generic medicines
- Use of technology to improve productivity.

In India, healthcare spending as a percentage of GDP is a concern too, not because it is high, but because it is comparatively low at approximately 4 per cent and more importantly two-third of the expenditure is borne by the individuals themselves<sup>2</sup>.

**Table 1: Out-of-pocket expenditure on health as a percentage of total expenditure on health, 2015<sup>3</sup>**

Country	OOP% in 2015
USA	11.1 %
UK	14.7%
Germany	12.5%
China	32.4%
Brazil	28.3%
<b>India</b>	<b>65.1%</b>

Hence, in the Indian context, it is important to look at affordability of healthcare spending from an individual's perspective. Many leading hospitals deliver clinical quality, which is world class and at a fraction of the cost as compared to its global peers. While prices for healthcare services are comparatively low, the spending capacity of a large proportion of the population is also limited. **For 80 per cent of the urban population availing a Coronary Artery Bypass Graft treatment would mean forfeiting 6 months - 2 years of their total household expenditure<sup>4</sup>.** Further, it is estimated that 63 million people slip below poverty line due to healthcare related expenses.

2. The World Bank - Global Healthcare expenditure database, accessed on 10 Sept 2018

3. The World Bank - Global Healthcare expenditure database, accessed on 10 Sept 2018

4. NSS report no. 574: Health in India, 71st round 2014; KPMG in India analysis; Assumption: CABG cost INR 90,000 (Ayushman Bharat Rate); 80per cent decile monthly per capita expenditure (MPCE) – INR 3063, Average family size – 5 members


Government—both at the Centre and state levels—have been making efforts to render healthcare more affordable to the masses by strengthening its role as a payer of healthcare services for identified population groups and through policy interventions to control prices of certain drugs, medical consumables and implants, refer table 2. While these interventions have contributed to improving patient affordability, it has significantly impacted margins of hospitals.

The central government introduced the National Health Protection Scheme in 2018, which aims to cover 100 million families with an insurance cover of INR5 lakh per family. The notified prices for the approximately 1,350 packages have been pegged at levels which are 15-20 per cent cheaper than the rates under the Central Government Health Scheme (CGHS) scheme. With the government committed to Universal Health Cover for all by 2030, the number of families covered under this scheme may increase over the years.

**Table 2: Key government interventions**

1

Drugs




Number of drugs covered under Drug Price Control Orders (DPCO)<sup>5</sup>:

- 2013: 628 formulations
- 2018: 869 formulations (spread across 31 therapeutic groups)

2


Surgical implants



Cardiac stents and orthopaedic implants brought under price control

3

Medical devices




Monitoring price movement of 19 medical devices declared as drugs, though no price controls have been introduced yet

- Disposables such as hypodermic syringes, needles and perfusion sets
- In-vitro diagnostic devices of HIV, HBsAg and HCV
- Implants like orthopaedic, intra ocular lenses, heart valves
- Others such as catheters, I.V. cannula, bone cements, scalp vein set
- Ligatures, sutures and staplers, surgical dressings, umbilical tapes
- Blood/blood component bags, blood grouping sera
- Ablation devices.

4

National Health protection Scheme (NHPS)



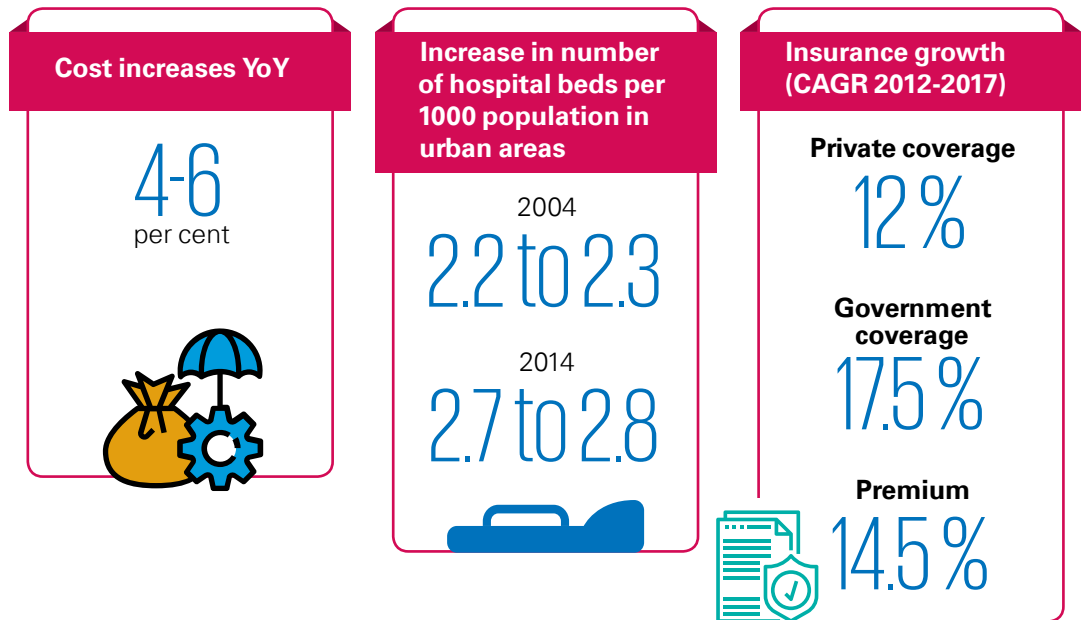
~1350 packages have been pegged at levels, which are 15-20 per cent cheaper than the rates under CGHS' scheme

5. National Pharmaceutical Pricing Authority, Department of Pharmaceuticals, Government of India



While the government's intent to improve affordability of healthcare service is quite laudable, the actions have placed significant pressure on profit margins of healthcare providers. This pressure is further accentuated by increased market place competitiveness and gradual increase in insurance coverage, limiting the ability to pass on the increased costs to the patients.

### Sources of pricing pressure on healthcare providers<sup>6</sup>



6. National Health Profile 2004, 2015, NSS 71st Round, KPMG Analysis, Industry inputs, IDRA report

Since implementation of the government regulated price caps on cardiac stents and knee implants, hospitals have been feeling the pinch with EBITDA erosion of about 200-300 bps<sup>7</sup>.

**These changes are challenging the business of hospitals in multiple ways:**

**Trend - Shifting source of earnings** >>

In general, two-third to three-fourth of a hospital's EBITDA is contributed by margins on drugs, medical consumables and implants, with services being priced at very thin margins.

Price controls on drugs and implants, have caused erosion in margins, which is being set-off, at least partially, through review of services and their charges (patients and services not covered under fixed price package).

**Emerging imperatives**

- Re-look at services rendered
- Re-assess cost associated with delivering of the services and determine the right tariff.

**Trend - Shift in emphasis from revenue-driven models to increased focus on operational excellence** >>

Increasingly, it will only become critical for hospitals to look at ways and means of unlocking efficiencies, reducing waste and controlling costs. Reasons include:

- Increasing share of business from fixed price packages, which provides lower revenues and severely limits passing of any excess costs to the patient or the payer
- Higher competition from increasing number of corporate hospitals, limiting flexibility on price increase
- Trust deficit among patients with respect to hospitals and, therefore, do not appreciate surprises in the billing.

This would require hospitals to take a real hard look at the way they operate, challenge some of the traditional industry practices, learn from experiences of companies in other sectors and use advancements in technology for optimised and well controlled operations.

**Emerging imperatives**

Strengthening internal organisational capabilities , processes, systems, skills to deliver quality care in most cost efficient manner.

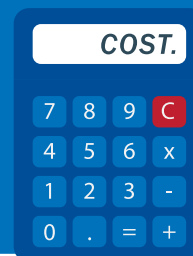
In the future, with such multiple changes in operating environment, hospitals would need to 'look within' and identify sources of cost efficiency.

7. India Equity Research on Healthcare dated 09 October 2017



## 2

# Where does cost efficiency start?



### Where does cost efficiency start?

Quite often we come across hospitals where decisions taken at the project stage not only has a significant impact on the financial health of the hospital in their years ahead, but also casts a shadow on their operating costs. So, ideally the journey should start when project related decisions are being taken at the conceptual stage. There are two areas of importance:

**1. Planning to be efficient:** Efficiency starts with planning the facility right – a plan that intends to realise the business vision while being guided by reality. For example, for critical care, it could mean answering questions such as how many critical care beds are needed, are ventilators required for all beds, do all beds need to be equipped for highest level care or there should be step-down care beds as well, or what technology and equipment are to be used, etc. While planning right seems obvious, we come across quite a few healthcare facilities whose configuration defies logic of efficient or financially feasible planning.

**2. Procuring for value -** Total Cost of Ownership (TCO) concept: In many cases, purchase decisions in healthcare focus only on the purchase price and specifications, but fail to consider operating costs and quantifiable financial benefits associated with better outcomes and clinical care.

As a concept in medical equipment procurement, it is increasingly gaining traction internationally, especially with EU 2014/24 directive on public procurement requiring that all public procurement must be based on Value for Money (VFM). European Union procurement rules define VFM as ‘the best mix of quality and effectiveness for the least outlay over the period of use of the goods or services bought’, which should be achieved through competition, unless there are compelling reasons to the contrary.

Hospitals need to follow a similar approach to ensure long term cost efficiency. Understandably, there are challenges in adopting this approach, since the concept though not new, is being implemented more recently over the last few years.

### Practical barriers

Availability of reliable data:

- Availability of data with suppliers to support claims regarding outcomes and clinical care
- Confusion in the process since each vendor comes out with counter claims

Risk of bringing in subjectivity if procurement process departs from low upfront cost as a criteria.

### Examples of how these barriers are being addressed

- For small medical equipment and medical consumables, suppliers are being asked to demonstrate benefit in real/test situations
- For larger equipment, and where benefit accrues over a longer period of time, risk sharing arrangements with suppliers are being contemplated, where there are incentives/penalties for suppliers based on claimed vs. actual outcomes and benefits
- Suppliers are investing time and money to establish VFM for their products.



# Case study: Advanced anaesthesia machine | Critical care

## Context

- Unwanted high exposure to anaesthetic agents have undesirable clinical side effects, which include need for post procedure respiratory assistance and closer patient monitoring
- Anaesthesia machine technology plays a critical role (in addition to anaesthetist's skills) to reduce cost of anaesthetic agent consumption and reduce the length of stay in critical care/ observation units
- Appropriate delivery of medication and gases is the decisive factor in improving the patient's safety, especially during critical care management using anaesthetic agents.

## Technology

- Ventilation technology with in-built sensor systems offers patients with free breathing ability at all times, irrespective of the selected ventilation mode
- The pharmacokinetic model allows the system to predict anaesthetic gas concentration at all times, along with providing a 10 minute historic trend and a 20 minute predictive trend, to allow the anaesthetist to manage the anaesthesia process better

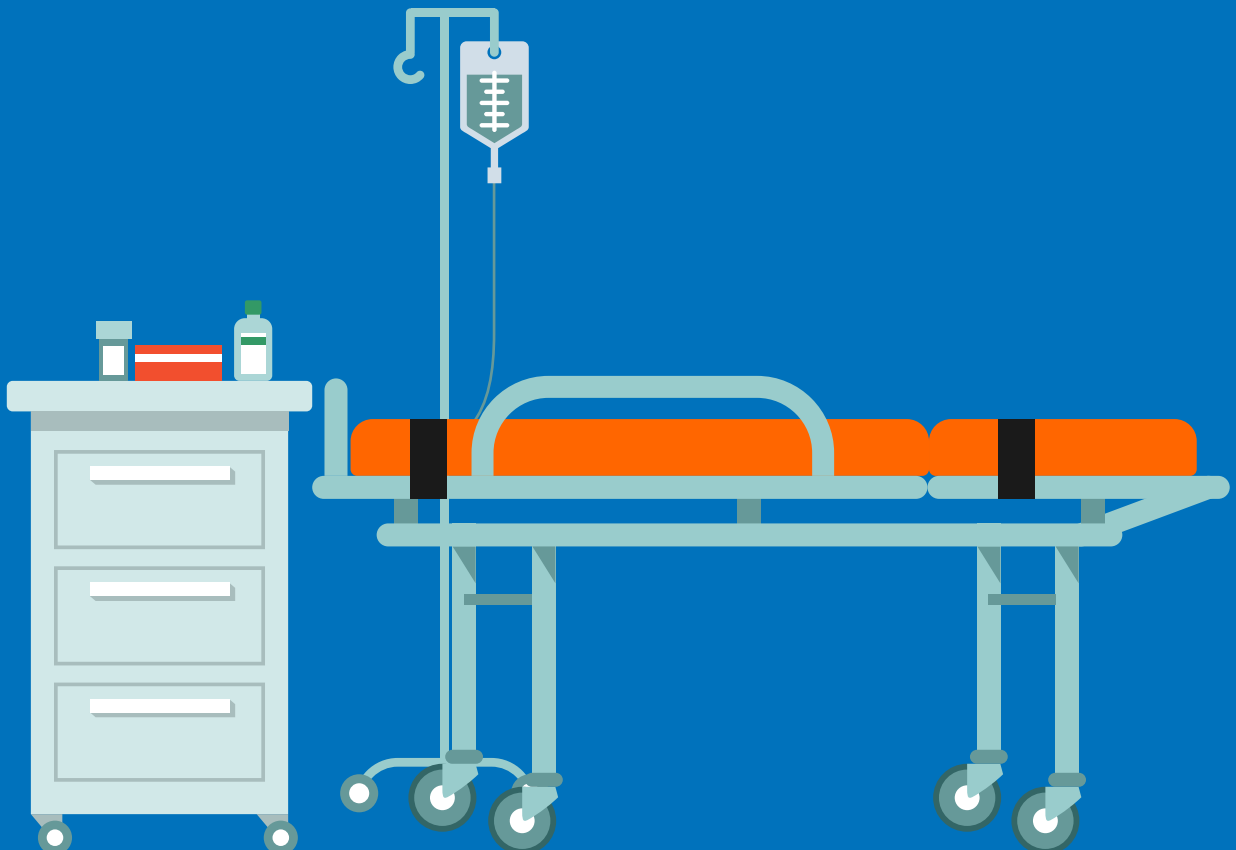
- Ability to deliver anaesthetic gas optimally and allowing to operate a low gas flow not only reduces wastage of anaesthetic agent but also reduces risk to patients and improves post procedure outcomes.

## Benefits

- Study indicates that due to lesser consumption of anaesthetic agent, average cost saving per procedure can range from INR750 to INR365 per case. In case of fully operational unit, cost savings can range to the tune of INR7 lakh to INR14 lakh per annum, implying a payback in the first year itself
- Better patient experience with quick recovery and lower stay time in step down unit.

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**Source:** Discussion with medical device companies





## **Journey ahead for an operational hospital -- special focus on acute care areas**

While hospital care in general is expensive, it is specifically so in critical care (which is more resource intensive), where 50-70 per cent of the expenses occur. This includes emergency rooms (ER), intensive care units (ICU) and operating theatres (OT). Further, it is estimated that 70-80 per cent of the costs incurred in these critical care areas are fixed in nature. This includes cost of infrastructure and its mandatory upkeep, clinicians, nurses and other dedicated staff. As for the variable component of expenses, as evidenced both by research<sup>8</sup> and practical experience, there are clinician associated variations in resource utilisation even when outcomes are not significantly different. Hence a cost efficiency programme should comprehensively cover the following four aspects:

- 1. Appropriateness of use** of critical care facilities: e.g. is it required for the patient and if so, what level of intensive care is required?
- 2. Optimisation of resources used to deliver care:**
  - Which resource is used (e.g. appropriate drug/brand of drug used, skill level of staff)
  - Quantum of resources utilised (e.g. materials, diagnostics)
  - Cost per unit of the resource (e.g. Procurement costs for drugs)
- 3. Reduction in variability in care –** standardisation to reduce clinical and operational variations in terms of care practices, resources utilised and in duration of stay

8. Garland A, Shaman Z, Baron J, Connors AF, Jr. Physician-attributable differences in intensive care unit costs: a single-center study. Am J Respir Crit Care Med 2006;174:1206–1210



**4. Improvement in quality** – to avoid unnecessary expenditure, say on account of hospital acquired infection (HAI), and reduced length of stay (LOS)

While all these improvement aspects require multi-disciplinary interventions

and top management ownership and stewardship, they vary in terms of impact, time and effort required for implementation and extent of change management required. For hospitals, embarking on this journey, there would be three broad themes.

Theme	I. Achieve	II. Enable	III. Sustain
Objective	Cost transformation to achieve a new cost normal	Implement changes which would support cost efficiencies	Sustain cost efficiencies achieved and continue the improvement journey
Focus areas	<p><b>Short term initiatives</b></p> <ul style="list-style-type: none"> <li>Optimise resources used to deliver care <ul style="list-style-type: none"> <li>Material – procurement cost and consumption</li> <li>Manpower.</li> </ul> </li> </ul> <p><b>Longer term initiatives</b></p> <ul style="list-style-type: none"> <li><b>Improvement in quality</b> – reducing length of stay and avoidable complexities</li> <li>Reducing variability in care – standard care pathways</li> <li><b>Asset sweating</b> – improved throughput to reduce overhead costs per patient.</li> </ul>	<ul style="list-style-type: none"> <li>Service costing and profitability analysis</li> <li>Doctor engagement models</li> <li>Technology implementation – EMR and advanced analytics.</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring and management</li> <li>Continuous improvement programme and infrastructure.</li> </ul>



**Optimising resources:**

- **Material procurement**
- **Material consumption -- drugs, medical consumables and implants**

Material cost as a percentage of total expenditure in a typical multispecialty hospital

**25-35**  
per cent



Hospitals have consistently tried to optimise their expenditure on drugs, medical consumables and implants. However, the efforts have often fallen short of maximising the opportunity. Besides, the focus of these efforts has largely been on cost efficiency in procurement, while little has been done on optimising the consumption. The reason is quite understandable since procurement mainly requires dealing with external vendors, may be for a couple of times in a year whereas consumption optimisation requires top management involvement, tougher discussions with clinicians and concerned staff, and a constant vigil from the management.

**1. Procurement cost reduction**

Cost reduction opportunity:  
**15-20 per cent of procurement costs**

Challenges that hospitals need to overcome	Way forward for the hospitals
<b>User preferences</b> User (the clinicians) dominates the decision regarding which brands of drugs, medical consumables and implants to buy, thus limiting purchase team’s negotiating power with suppliers	With the size of opportunity which is at stake, hospitals should consider undertaking a procurement cost transformation project with the following eight steps:
<b>Poor commercial effectiveness</b> <ul style="list-style-type: none"><li>• Limited market intelligence on procurement prices</li><li>• Poor competitiveness due to limited supplier base on account of:<ul style="list-style-type: none"><li>- Clinician preferences for brands</li></ul></li></ul>	1. Estimate the cost reduction opportunities with relevant market intelligence and/or a price discovery process

<ul style="list-style-type: none"> <li>- Limited efforts by sourcing team to expand list of suppliers</li> <li>- Poor negotiation effectiveness.</li> </ul>	
<p><b>Lack of a well-defined inpatient formulary</b></p> <p>While many hospitals, specially NABH accredited, have formularies, they fall short of meeting the agenda of driving cost efficiencies due to:</p> <ul style="list-style-type: none"> <li>• Absence of usage guidelines – i.e. which brand of a formulation is to be used under a given situation</li> <li>• Brands in formulary not aligned with the cost agenda: Brands selected in the formulary are not necessarily the ones with lower cost despite having no explainable difference in quality.</li> </ul>	<ol style="list-style-type: none"> <li>2. Review formulary design to align it with cost optimisation agenda</li> <li>3. Communicate the need to undertake the programme to clinicians, key staff members and at appropriate stage to vendors as well</li> <li>4. Identify potential risks and develop mitigation plans (e.g. managing clinician's concern about product quality through organised workshops with relevant vendors, having co-agreed fact based brand qualification criteria)</li> </ol>
<p><b>Non-compliance to formulary</b></p> <p>Even when there is a hospital formulary and usage guidelines, they are not adhered to. Either the brands are not used as per usage guidelines (e.g. the usage logic may define that a patient may be prescribed the least cost drug and only in case of non-availability, should a higher cost drug be used), or the brands that are not in formulary are prescribed by physicians or surgeons.</p> <p>Use of brands which are not in formulary is one of the leading causes for adhoc and interim purchases by hospitals at higher cost. This also reduces the purchase team's ability to negotiate better pricing with the vendors.</p> <p>The key reasons for non-compliance are:</p> <ol style="list-style-type: none"> <li><b>1. Usage guidelines</b> are either not clearly defined or not communicated as guidelines to be complied with</li> <li><b>2. Lack of sternness</b> on the part of management to enforce compliance</li> <li><b>3. Absence of IT system to support compliance</b>, especially given the operational complexities and hesitation in highlighting non-compliance to formulary to clinicians, enforcement of compliance through manual controls is not practical and requires a system-based compliance logic.</li> </ol>	<ol style="list-style-type: none"> <li>5. Execute a sharp RFP based procurement process with a highly effective negotiations process as against a day-to-day procurement process</li> <li>6. Obtain clinician buy-ins with fact based approach and top management's support</li> <li>7. For formulary implementation, develop the required policy and guidelines</li> <li>8. Develop an IT-based system to implement the formulary design.</li> </ol>

## 2. Consumption optimisation

### Consumption rationalisation: 5-10 per cent reduction in costs

*(Maybe 25-50 per cent in some key surgical procedures)*

In our experience, for any given surgical procedure or medical care, a wide variation exists in usage of materials and diagnostic tests by surgeons – within a hospital and across the hospitals of any hospital chain, even after accounting for complexity of cases. For example, in cardiac procedures, we have seen this difference to be as high as 50 per cent. This could essentially mean that among the surgeons conducting a particular surgery, only one surgeon is doing right (comparable outcomes at least cost), or it could mean none of them are doing it right, and they all need to together come up with the most optimal cost of care.

Hospitals should approach consumption rationalisation comprehensively both in critical and non-critical care setting.

**In critical care,** the focus should be to rationalise consumption and establish norms for a surgery and thus reduce variability

**In non-critical care settings,** the focus would be on ward consumptions to check and control any abnormal deviations beyond the set norms.

### Critical care setting

Challenges that hospitals need to overcome	Way forward for the hospitals
<b>1. Management discomfort and false comfort:</b> Consumption in critical care and OTs is generally considered too technical for hospital management to tread into	<p>Successful consumption rationalisation exercises need involvement and support of clinicians. However, the inefficiencies in consumption are not caused by clinicians alone. In cardiac procedures, a significant proportion, 30-50 per cent, of the inefficiencies could be due to work practices followed by technicians and nurses.</p> <p>With increasing pressure on margins, hospitals need to start an open dialogue with the clinicians and sensitise them on the need for such an initiative.</p>

## 2. Absence of benchmarks/ references/hospital's own consumption norms:

Hospitals find it difficult to set the consumption norms or benchmarks that they can aspire for. Reasons include external benchmarks not readily available or clinicians find it difficult to relate to them, or for single hospital entities, there can be no internal benchmarks.

For establishing norms, some of the effective methods include:

- **Internal benchmarking** not only at procedure level but also at consumption item category level so that the most efficient practices at this sub-category level is used to establish the norms. This can give hospitals a good start since these norms emerge from their own hospital setting and from performance which their own peers have achieved. These norms may not be the most efficient since best external norms are used extensively.

- **Peer benchmarking – working together for common good:** Hospitals in a city or region can come together, may be under the aegis of their industry or professional body and facilitated by independent third party, to work out the most efficient consumption norms from which each one of them can benefit.

The above suggestion may sound preposterous, but with focus on utilisation of resources and not sharing professional intellectual property of individual clinicians, this can be a doable proposition, especially when the emerging scenario calls for it.

- **Use of external references:** Much work has been done in this area and there are many published clinical protocols and usage guidelines. While these can be good references, normally these are available in piecemeal, and sometimes clinicians find them difficult to accept.

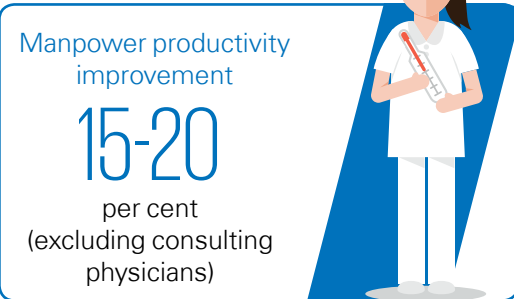
<p><b>3. Logic that each patient is different and hence there cannot be any norms:</b></p> <p>While it is a normal perception, this stems from the fact that an effort has not been made to find the pattern in the chaos</p>	<p>Even though the payers may not reimburse differently for complicated cases, consumption norms should be defined differently for various levels of risk. Various risk classification frameworks are available which can be adopted.</p> <p>While reviewing deviations with clinicians / concerned staff, this would help in having more constructive conversations since then the deviations beyond a certain tolerance cannot be dismissed as the deviations on account of patient being different.</p>
<p><b>4. Insufficient data and reporting:</b></p> <ul style="list-style-type: none"> <li>• Most hospitals track average consumption per surgery, but it is not sufficient to control and optimise. The deviations have to be tracked to consumption subcategories to generate actionable insights</li> <li>• Changes are required in processes and master data of IT systems to record relevant base data for analysis, such as consumption sub-categories, risk categorisation of patients, norms</li> <li>• Required analytical and reporting capabilities need to be added to the hospital's IT system.</li> </ul>	<ul style="list-style-type: none"> <li>• Modify processes to record required master and transaction data</li> <li>• Invest in developing <ul style="list-style-type: none"> <li>- Consumption tracking system in IT</li> <li>- Necessary analytics capability to provide insights on deviations and adherence to norms and policies.</li> </ul> </li> </ul>
<p><b>5. Specific usage policies, guidelines not available or not implemented:</b></p> <ul style="list-style-type: none"> <li>• These guidelines are required to serve as yardstick for deviations.</li> </ul>	<p>Establish usage policies/guidelines (in some cases surgery-specific) and a robust monitoring mechanism to ensure appropriate usage. For example, antibiotic policy to discourage use of more potent and expensive antibiotics as a first line of treatment just to deliver quicker improvement.</p>

<p><b>6. Misaligned incentives:</b></p> <p>Mostly remuneration structure of the doctors does not factor in outcomes or how cost efficient they are. So there are no incentives for the doctors or the staff to change their way of working.</p>	<p>Evolve appropriate incentive structures to drive behaviour towards good outcomes at lower costs.</p>
<p><b>7. Effectiveness of controls to manage consumption proactively:</b></p> <p>Mostly, consumption analysis is done post-facto and mechanisms to control during the time of consumption are largely absent.</p>	<p>Some of the methods to control consumption that hospitals have explored successfully are:</p> <ul style="list-style-type: none"> <li>• <b>Surgical/procedure kits:</b> Some hospitals have developed standard surgical kits with a predefined set of materials and consumables, which prevent wastage and increase cost accountability on the part of the physicians/surgeons using them. The option to use materials outside the kit is allowed, but needs to be justified and rationalised.</li> <li>• <b>Doctor preference cards:</b> These are cards that outline all the resources (equipment, drugs and consumables), surgical equipment (size to tools, etc.), that a doctor requires for a procedure or a surgery. This just builds on the kit concept above but gives a doctor-specific touch.</li> </ul>

## Non-critical care setting

Challenges that hospitals need to overcome	Way forward for the hospitals
<p>Overconsumption in wards specially for departmental consumption items.</p>	<ul style="list-style-type: none"> <li>• For key consumables, set norms for expected consumption on per bed basis</li> <li>• Develop IT system to monitor significant deviations and highlight problem areas</li> <li>• Implement Electronic Medical Record (EMR) which can help control consumption costs by 2-6 per cent.</li> </ul>

## Optimising resources: manpower costs



Hospitals are one of the most labour intensive institutions, with even the non-clinician manpower burden ranging from 20-30 per cent of the total costs, while clinicians contribute to an additional 25-35 per cent. Among all areas within a hospital,

critical care units are the most labour intensive, for example, ICU/CCU together would deploy 40-60 per cent of the nursing staff.

For hospitals to generate acceptable level of internal rate of returns, they need to earn EBITDA in the range of 22-24 per cent per annum with an occupancy of 75-80 per cent in four to five years of their operations. Hence, operating costs have to be around 75 per cent of the revenues, and total manpower costs should be around 35-38 per cent, provided other costs allow that. Hence controlling non-clinical manpower costs to 18-20 per cent and clinical to 16-18 per cent of the revenues would be important for sustainable and profitable business operations.

Challenges that hospitals need to overcome	Way forward for the hospitals
<p><b>1. 'Rule of thumb' dominates - No zero-based manpower planning:</b></p> <p>A large proportion of corporate hospital industry in India is barely two decades old. It had been slow in attracting managerial talent and deploying latest management thinking. Understandably the focus had been on attracting clinical talent and ensuring that the operations run smoothly.</p> <p>In the process, manpower productivity never got the attention it deserves.</p> <p>The industry continues to operate on past experiences and wisdom of a few clinicians and administrators and the 'rule of thumb' benchmarks. This exposes the industry to a higher risk of institutionalising inefficiencies.</p>	<p>Hospitals should consider undertaking manpower productivity improvement exercise in two stages:</p> <ul style="list-style-type: none"><li>• <b>Stage 1:</b> Align to industry level efficiencies – high level comparison with 'industry references' to identify gaps and areas of improvement</li><li>• <b>Stage 2:</b> Zero-based manpower planning to create own standards and staffing norms.</li></ul>



## 2. Conflicting business and operating priorities:

Hospitals are positioned as institutions meant to provide care for human life - reduce mortality as well as morbidity. Measures of cost containment to improve business margins by optimising human resources, is frowned upon as fewer staff counts are assumed to directly impact quality of clinical care and patient experience. The essence of 'human touch' is strongly engraved in the ethos of clinical care and in the 'perception' of quality care by patients as well. This, therefore, leads to significant internal resistance to optimisation, especially from the clinical teams.

## 3. Tendency to overstaff:

For multiple reasons, hospitals may resort to overstaffing. These include

- **Limited confidence in technology:** While many medical and support technology advancements are targeted towards improving care by reducing effort and man hours per activity, in most cases these benefits are not recognised and leveraged for increasing efficiencies
- **Non-documented (non-core) activities to manage operational chaos:** Poorly defined workflows and responsibilities, lack of clearly defined job description and role, no agreed interdepartmental service level agreements have resulted in poor coordination and chaos. This leads to people spending non-productive time in managing the chaos, which could be as high as 30 per cent in some staff categories.

### **Staff not clear on what performance is**

**expected of them** – hence they perform many unnecessary activities assuming that these activities matter.

With the resultant reduced bandwidth, the easier/quicker, but commercially damaging resolution most often implemented is an increase in people count.

For both the stages, we recommend the following approach:

- 1. Set baseline** to document current levels of operating performance so that any manpower productivity improvement should at least maintain this. Parameters could span clinical care, patient experience, operational performance plus employee satisfaction.

## 2. Reduce work:

### • **Reduce activities:**

Use Lean-Six Sigma methodologies to reduce non-value added activities

### • **Reduce time taken to perform activity:**

Apart from Lean, use technology to automate/eliminate steps and improve management. For example, porter/general duty assistants (GDA) management app on the lines of cab apps to have better visibility, reduce unnecessary walking time and improve service levels for user department.

## 3. Staff appropriately:

- Align staff to work load patterns, e.g. in nursing, it can be acuity based staffing

<ul style="list-style-type: none"><li>• For example, our assessments indicate that, typically, an average nurse spends almost 30 per cent of her/his time on non-core (or non-clinical) activities (such as coordination for admission and discharge, doctor visit coordination), which in most cases should be an exception rather than a norm</li><li>• <b>Attrition and limited availability of skilled staff:</b> To de-risk themselves from issues of staff shortages and sudden exodus, hospitals hire more staff, especially at junior levels, where attrition levels have conventionally been high. While these strategies may help hospitals to sustain operations, even amidst high attrition, it has a direct implication on its manpower costs.</li></ul>	<ul style="list-style-type: none"><li>• Eliminate role overlaps by fixing responsibilities on the staff</li><li>• Empower so as to have less supervision and better span of control</li><li>• Impart skill and technology training.</li></ul> <p><b>4. Clarify on performance expectations:</b></p> <ul style="list-style-type: none"><li>• Let the staff know what is expected from them and what a good performance means</li><li>• Have objective ways of measuring performance.</li></ul> <p><b>5. Leverage technology:</b></p> <p>For example, most ventilators can trigger alerts based on patient breathing patterns and multi-parameter monitors can track and trigger alerts for unusual variations in more than seven vital parameters. These functionalities help lower the time spent by nurses in monitoring patients and therefore increases their ability to manage more patients. However, despite this, most hospitals adhere to the defined norm of 1:1 nurse per bed for ventilated beds.</p>
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#### 4. Outdated staffing norms:

Recommended staffing ratios across different staff cadres have been suggested by various professional bodies such as nursing councils, paramedical councils. More recently, hospital accreditation programmes (e.g. NABH) have been mandating healthcare providers to adhere to these prescribed staffing norms.

Unfortunately, in most cases, these staffing norms are significantly outdated, and do not take into consideration more recent technological and clinical advancements. For example, the Nursing Council recommended nurse to bed ratios are almost two decades old, which most likely would be an overkill with the advent of newer nursing station designs and monitoring systems, which enable higher efficiency and quality in patient monitoring and care delivery.

The issue of staffing ratios needs a relook, which the industry bodies need to take up with respective councils and come up with alternative approaches considering efficiency generating tools (e.g. monitoring technology), acuity of patients rather than one size fits all approach.

For example, a study on nursing staffing requirement at the Coronary Unit of PGIMER, Chandigarh revealed that after catering to acuity of patient and different dependency level of patients, nurse requirements was one per two patients as compared to nursing council norms of one nurse per patient per shift.<sup>9</sup>

9. Deepi, Sunita Sharma et al, 'An exploratory study on "nursing manpower" requirement for coronary care unit of PGIMER, Chandigarh', Nursing and Midwifery Research Journal, Vol-6 No 1, January 2010

# Case study: Remote patient monitoring system | High dependency unit

## Context

- Up to 30 per cent of all admissions in Intensive Care Units do not require ICU settings and can be managed optimally in step down units like HDUs. Qualifying cases could include:
  - Viral thrombocytopenia fevers with complication
  - Geriatric patients
  - Patients with a history of IHD and rhythm disorders
  - COPD, asthma and sleep apnoea patients
  - Gastroenteritis and electrolyte disturbances
  - SIRS and early sepsis patients
- Continuous monitoring solutions in HDUs, patient rooms and wards can help reduce ICU admission and re-admission rates, improve patient safety and optimise hospital length of stays
- Continuous monitoring system can help save 15 per cent of the nursing time which is spent in collecting and documenting vitals.

## Technology solution

- A plug-and-play, workflow optimised, cloud connected patient monitoring solution that allows clinicians to view and manage patients remotely
- Captures six key vitals that can help in improved clinical tracking and monitoring of the patients
- Automated monitoring and documentation of vitals with high-resolution long term trends of data collected every five minutes
- Proactive clinical decision support system, which improves clinical outcomes and patient safety.

## Benefits (For a typical 10 bed unit of HDU)

- Can operate at lower Nurse to Bed ratio, 1:4 to 1:5
- Billing on patients in non-ICU setting at lower costs
- Improved utilisation of the ICU and can manage with smaller ICU settings
- INR5-6 lakh per annum savings and INR7-8 lakh per annum additional earning
- Better returns on ICU per bed.

**Source:** Discussion with medical device companies



## Quality as a cost efficiency driver



As per a study conducted by International Nosocomial Infection Control Consortium (INICC)<sup>10</sup>, India has higher rates of hospital acquired infections (HAI) and the risk that a patient will develop HAI is one in four. Higher HAI not only results in extra cost to the hospital and patient, but also causes an increased length of stay for the patient. With the market moving towards fixed price packages, these costs will now have to be borne by hospitals, and shall directly impact their profitability.

A study<sup>11</sup> indicated, that treatment costs are about five times higher for patients with HAI, contributed by three times higher ALOS and nine times higher drug costs. Reduction of HAI by 50 per cent has a potential to reduce direct costs<sup>12</sup> by up to 6 per cent. With the increasing movement towards fixed priced packages, this could be a direct cost saving for hospitals.

Apart from continued and more intense focus on quality, hospitals will need to make three important changes:

### 1. Give quality a strategic focus

- The department needs to be adequately equipped, staffed with a multi-disciplinary and empowered team of microbiologists, lab teams, doctors from various clinical specialties and pharmacologists
- Give HAI and other avoidable complications a hue of extra cost incurred – it normally attracts the top management's interest
- Leadership has to adopt a zero HAI approach.

### 2. Encourage 'true' and timely reporting of HAI

3. Use IT and analytics to take the clinical information related to communication of disease and infection surveillance patterns and corroborate it with the microbiology information, the laboratory information, and the antibiotic information for prevention and timely actions.

## Reduce variability – standardisation of care practice through protocols and care pathways

Protocolised care for multiple areas, such as sedation, glycemic control, ventilator management, have been shown to reduce variation and improve the outcome of critical illness<sup>13</sup>. Research has shown that

10. Device-Associated Infection Rates in 20 Cities of India, Data Summary for 2004-2013: Findings of the International Nosocomial Infection Control Consortium, November 2015

11. Assessment of Costs Associated with Hospital-Acquired Infections in a Private Tertiary Care Hospital in India

12. Direct costs include drugs and investigations

13. Holcomb BW, Wheeler AP, Ely EW. New ways to reduce unnecessary variation and improve outcomes in the intensive care unit. Curr Opin Crit Care 2001;7:304-311

broad application of these protocols, while providing for adjustments to protocols based on patient needs, do reduce costs, not only by reducing length of stay, but also by reducing the incidence of complications such as HAI. Protocol use recognises the simple fact that harm can result when care is completely left to a single individual's skill and memory.

Increasingly, hospitals and clinicians are exploring and adopting care pathways and checklists but the pace of adoption needs to increase significantly. In practice, the standards and guidelines are often forgotten. So it will be important for the hospitals to automate pathways and make them standard operating procedures.

### **Process effectiveness – reducing disallowances and delays in payment - up to 50 per cent reduction in value of disallowances**

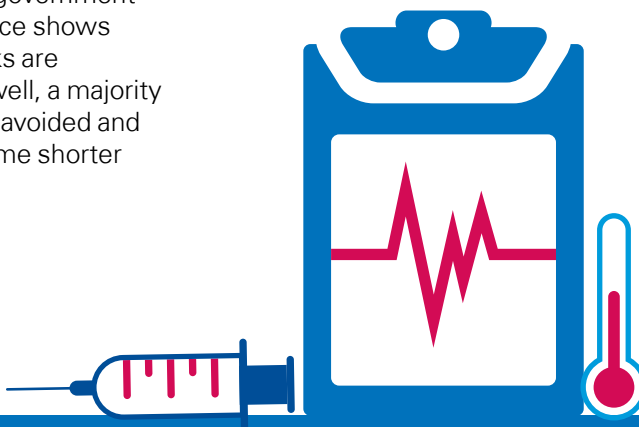
Hospitals often suffer from disallowances and delays in receiving payment for the bills from insurance companies or government health schemes. Our experience shows that if adequate process checks are implemented and monitored well, a majority of these disallowances can be avoided and payment cycles can also become shorter

since the number of queries from payers also comes down.

### **Asset sweating – improved throughput to reduce overheads**

The cumulative impact of initiatives for optimising resources, enhancing quality of care and processes, and reducing variability will empower throughput across all hospital assets. Process efficiency with enhanced coordination between different departments and care providers will have a cascading effect on optimising ALOS.

Further, with focus on maximising earnings per square foot of hospital area, a re-look at hospital configuration, for example, mix of hospital beds towards more marketable bed categories, can significantly improve hospital asset utilization and its profitability.



## Theme II

## The journey ahead **Enable**



In the stage-II, hospitals could look to design and implement fundamental and structural changes to imbibe cost efficiencies in the way of thinking and working.

### **Implement service costing and profitability analysis reporting**

Most hospitals do not know what it costs them to serve a patient and how profitable a patient is. It is critical that hospitals gain this visibility so that they can identify pockets of unsustainable costs and undertake a continuous improvement programme.

#### **Key steps forward:**

**Develop a robust service costing framework** which is appropriate for the stated purpose, gives a reasonable estimate of costs, is practical but not administratively time consuming

**Estimate service cost of identified number of services** at defined granularity, e.g. Procedure – patient type – bed category by cost element

**Develop an IT based business intelligence tool to provide costing of service at the click of a button and enable analysis** such as 'what-if', 'sensitivity', 'historical trends'.



## **Orient doctor remuneration models to incentivise cost efficiency**

There are many doctor remuneration models prevalent in the industry. In most of these models, revenue earned by the doctor for the hospital is taken as a performance measure to which a doctor's remuneration is directly or indirectly linked. Since clinicians significantly influence many costs in a hospital, such as brands of drugs and consumables to be used, consumption in surgery, adoption of standard protocols to reduce variation, involving them in cost reduction initiatives and linking a component of doctor's remuneration to achievement and sustenance of cost efficiencies could be critical.

### **Recommendations:**

1. Sensitise clinicians toward the need for having cost efficiency or margins earned as a performance parameter linked to remuneration.

2. Develop appropriate remuneration model – it should be simple and have only those aspects which clinicians can influence and control

3. Ensure that mechanisms to monitor outcomes to check that pursuit of cost efficiency do not threaten either quality of care or patient safety.

## **Leverage EMR and analytics to improve cost efficiencies and operations**

All hospitals have a huge set of clinical and operational data in patient files but that is not readily available for analysis and identifying sources of efficiencies. Going forward, implementing EMR can not only improve compliance to clinical and non-clinical workflows, but also make a wealth of information available for meaningful analysis and for use in improving efficiencies. EMR can help reduce cost in multiple ways. Some of them include:

1. Optimised material consumption and decreased clinical variability by linking clinical information in EMR with supply usage information from HIS systems
2. Acuity based dynamic staffing model, e.g. for nurses
3. Improved clinical pathways by using advanced analytics on clinical and outcome data.



Stage III focuses on sustaining efficiencies achieved. Regular monitoring and a continuous improvement programme are needed to continue the journey towards cost excellence.

Monitoring and management

Sustaining cost efficiencies achieved:

Smart healthcare organisations are obsessed with measurement and are driven by the belief that what gets measured gets done.

To define and deploy a robust monitoring and management system, hospitals need to overcome some challenges.

Challenges that hospitals need to overcome	Way forward for the hospitals
<p><b>1. Focus on cost efficiency in a hospital gets clouded due to:</b></p> <ul style="list-style-type: none"><li>• Appropriate key performance indicators (KPIs) for cost efficiency are not defined</li><li>• Accountabilities for cost efficiency are not clear</li><li>• Empowerment does not follow accountability</li></ul> <p>We come across many instances where for important cost efficiency related areas, KPIs are not defined or accountability is diffused.</p> <p>For example, most hospitals do not have KPIs for measuring appropriateness of departmental consumption.</p>	<p>Define the key performance indicators (KPIs) for cost efficiency, allocate clear accountability and along with required authority to influence them.</p>
<p><b>2. Data issues</b> such as master data not appropriately organised, transaction data residing across multiple systems, makes manual reporting unfeasible.</p>	<p>Implement a business intelligence system, which takes data from different systems and presents visual dashboards with relevant KPIs that can be drilled down to identify actionable insights and is available at the click of a button.</p>

## Implement continuous improvement programme: Lean – the healthy way forward

Hospital operations are complex and significantly people dependent. They require multiple hand-overs and a fine coordination, while being in an environment marked with high staff attrition rates. Understandably, there are multiple points of failures and things do go wrong – not only clinically, but operationally as well, which get manifested as many symptoms that are considered ‘normal’ in such a scenario. Symptoms could include delays in serving the patient, unproductive time spent by operational staff to get work done, errors in delivery of service or outcomes leading to repetition and thus high cost of operations, and a demotivated workforce plagued by high attrition.

For example, a process which has 25 steps (for comparison, a routine blood sample’s journey could involve 50+ steps) and the staff is trained enough to complete that step with only one error out of 100 times it is executed, there would only be a 22 per cent probability that the process will get completed without an error. It simply indicates the extent of unproductive work and also a cost efficiency opportunity.

Achieving cost efficiency is not a one-time correction. It is a continuous journey, which requires commitment, investment and persistence over a long period of time. It is a learning journey for an organisation how to improve by being self-analytical and self-critical.

Over the last three decades, the manufacturing sector and for a little over the last decade, increasingly the world over, healthcare organisations are adopting ‘Lean Six-Sigma’. NHS of the UK has adopted Lean initiatives to boost efficiency, productivity (improved timeliness and quality of care) and enhance quality of work life for all manpower resources (less stressful and more rewarding).

In India, the pace of adoption of Lean Six-Sigma as a continuous improvement approach has been slow, and there is no doubt that it can be hastened. Some of the factors which have been holding it back are mentioned below:

- **Scepticism:** Due to close integration of operational and clinical processes, the resistance to change is comparatively high as compared to other industries. So application has been restricted leading to scepticism regarding its applicability and usability.
- **Focus and commitment:** As mentioned above, such a programme requires commitment, investment and persistence, which due to associated perception, does not get the top management’s required attention and commitment.
- **Lack of realisation:** With largely out-of-pocket payments, costs are mostly passed on to the patients. However, the changing scenario warrants a need to institute an operational excellence programme.

- **Lack of clarity:** The world over, early adopters of continuous improvement programmes have been healthcare chains and health systems (such as NHS) as they have been able to appreciate the benefits and invest with required focus and commitment. Smaller players lack the clarity of how to implement such a programme. Just having a few Lean trained persons do not equip hospitals adequately to undertake and sustain the journey.

However, the situation is tailor-made for Lean Six Sigma methodology to drive the continuous improvement journey. Lean helps to eliminate waste and Six Sigma reduces variation. These two combined approaches can help hospitals to achieve the following benefits:

- Relieve the pressure on the workforce by reducing chaos and disorganisation
- Enable the hospitals to achieve desirable outcomes within established timelines by minimising errors and repetitions
- Achieve higher level of cost efficiency and maintain profitability for the hospital.

## How to implement a continuous improvement programme

In order to successfully implement such a programme in hospitals, we recommend four broad steps:

**1. Top management commitment and focus** on continuous improvement as a strategy for differentiation. They need to create the environment for change and an organisational culture that is receptive to collaborative thinking and fact-based decision making.

**2. Develop a trained workforce** in the Lean Six-Sigma methodology and data analytics that can execute continuous improvement projects as a part time responsibility, along with performing their normal routine work.

In addition, appoint coaches – internal or external – who can guide the team on how to solve their problems themselves and also guide the management in strengthening the improvement programme.

**3. Set vision and operational excellence goals** from customer and cost perspectives.

**4. Align the HR policies** that have a robust system for reward and recognition of this workforce that is willing to walk the extra mile and dedicate additional hours for the benefit of the organisation.



## Summary of potential benefits from different interventions

### Optimising resources

#### Material procurement

15-20

per cent of  
procurement costs

#### Consumption rationalisation

5-10

per cent reduction in costs  
(Maybe 25-50 percent  
in some key surgical  
procedures)

#### Manpower productivity improvement

15-20

per cent (excluding  
consulting physicians)

#### Quality as a cost efficiency driver

3-10

per cent reduction  
in cost

#### Process effectiveness

For example, in  
claims management,  
up to 50 per cent  
reduction in value of  
disallowances

#### Asset Sweating - Improved throughput

(more patients treated per day –  
e.g. reduced ALOS, changed bed  
reconfiguration)

20-25

per cent increase  
in EBITDA for  
every 10 per cent  
improvement in  
throughput

**Note:** Actual opportunity would vary for each hospital.  
Benefits from reduced variability are largely included above









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