

Lean Hospitals

By

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1. SEEING WASTE

An incomplete list of health care wastes versus the equivalent Toyota categories.
Comments follow on the different wastes that exist in health care.

1.1. Over-production: Blood tests and pre-operative instrumental examinations Levelling health care delivery to peak demand

Variability of demand is a characteristic feature of the service offering and complicates its effective organisation. There are periods of peak demand, such as the early hours of the morning for the Emergency Department, as opposed to evenings and afternoons. An adequate amount of resources is required to cope with the impact of spikes in demand. But this means that a certain percentage of resources, particularly human resources, is redundant during periods of low or no demand. Providing a flexible response to demand is a major challenge in many service sectors, such as the postal system, public transport and, especially, health care. Levelling workloads to peak demand is the most common waste in health care. Load levelling occurs to protect systems against events that are unlikely to happen, but would threaten the system if they did. An influx of casualties to the Emergency ward following a serious accident or natural disaster would be difficult to handle with a shortage of technical resources. However, it is equally inconceivable to cater to low demand with the resources required to handle peak demand – this would represent an incredible waste.

Another problem is that demand spikes are rarely predictable. The system has to be able to accommodate emergencies (i.e. unpredictable and critical demand levels) while at the same time avoiding wasting energy under routine low demand conditions. In such cases, it is regarded as a waste to devote a huge amount of resources to deal with high but infrequent demand peaks (levelling loads).

Another example is when blood tests are ordered that are irrelevant to the patient's clinical protocol, e.g. endless lists of pre-operative exams are prescribed for the almost four million Italians who undergo surgical procedures every year. Eighty percent of these people are in non-critical condition, and their surgeries are elective, i.e. not emergency operations. In many cases, patients have had a battery of blood tests very recently, but hospital facilities invariably schedule the same exams before surgery just to be on the safe side. Clinical trials have proven that repeating blood tests is pointless. Defensive medicine prevents hospitals from confidently ordering an appropriate and safe number of minimum tests, and drives them instead to run endless tests on everyone, generating obvious waste purportedly to avoid litigation.

The same goes for human resources who are waiting for events to happen. In other words, the number of nursing staff on hand in Intensive Care when there are empty beds. Many hospitals have met with difficulties in shifting professionals of equal qualifications and skills to different duties to those they were hired for without loss of personal income.

The first case is one of over-production, the second of under-utilisation.

Take pre-operative examinations: in our facilities, they are a classic example of over-production especially for patients having level 1 or 2 procedures, in average physical condition and perfect balance,

aged 50 or younger. Below are several suggestions concerning pre-operative exams from the LGNRs (Italian Reference Guidelines) issued by the ASSR (in Italian, Agency for Regional Health Care Services) in 2005

1.2. Supplies waiting to be used: non-delivery. Unused or under-used Operating Rooms. Equipment breakdowns.

Assets must be fully utilised. Downtime for whatever reason should be regarded as a waste of the asset. Downtime due to a temporary breakdown of equipment interrupts the flow of the manufacturing process involving that particular asset. The same goes for equipment that is delivered late, for instance following repairs. Mismatches between delivery and usage represent a gap in the utilisation process, and therefore are a waste.

Poor planning, leading to vacant Operating Rooms, prevents surgery from being cost-effective. Assets can also be used uneconomically when procedures last longer than envisaged standard operating times. This applies to both the surgeon and the auxiliary in charge of cleaning the rooms, obviously with different responsibilities in respect of the patient, but the same responsibility in terms of management time. Patients entering the Operating Block at the wrong time can slow down the whole process, as can patients who cannot leave immediately after surgery due to complications upon waking. In such cases the existence of a feeder line (Recovery Room) is cost-effective: a place for accommodating patients awaking more slowly after surgery, while the Operating Room the procedure took place in can continue to be used as planned without affecting flow. This is a case of factory feeder lines applied to the hospital environment. This is widely recognised as a useful arrangement in health care, for reasons of safety rather than for ensuring an uninterrupted manufacturing flow; it also ensures less waste of (production) time.

The early closing of one or more Operating Rooms or an Operating Block, when there are fixed overheads and personnel costs and expensive and sophisticated equipment, is regarded as a non-recoverable loss of resources, due to poor planning. A classic example of waste is the sudden cancellation of surgeries sometimes for organisational reasons alone.

The following tables depict the conclusion of surgical procedures over a specific period of time, in all the operating rooms in the Surgical Block (10 rooms). The first curve plots the number of procedures that ended before closing hours for the operating rooms.

Operating rooms are considered to be underused if they are available for a maximum of six hours (8am to 2pm) but are vacant after 1pm. Sanitation and the general preparation of the facility does not take more than 40 minutes.

1.3. Moving materials or information: Inefficient staff movements. Doctor visits and collecting exam results. Patients waiting everywhere

The first thing that most people will say when describing hospitals is the amount of people waiting for something. Lack of activity is a sign that processes are not flowing efficiently. That schedules are not respected, that improving punctuality is an objective that most people still do not understand. Waiting rooms are full of people who have no idea when they will be seen, or when their clinical process will end. Waiting times cannot be measured or predicted.

Staff are always on the go; the logistics is haphazard; processes are poorly understood or re-examined, there are no performance indicators or improvement objectives. Medical examinations are requested and performed often without any apparent order or rationale, and even those that are actually processed lack improvement objectives. Visits are seldom timed. No objectives are set for improving time management.

The collection of patient reports is timed at the front desk, but there is no objective for dealing with queues, and the people collecting the reports waste much time and space. Medical examinations and patient reports are seldom coordinated via an on-line system designed to prevent waste. Where such on-line coordination does exist, it is not synchronised with other diagnostic processes.

1.4. People waiting: poor coordination among staff

An example of poor coordination between services, particularly in health care, is the deployment of the various operators responsible for ensuring the smooth and speedy turnover of the Operating Room, between one customer and the next. This process involves the surgeon, who estimates the duration of the procedure but is rarely accurate due to the individual variability of the pathology, as well as the variability of the surgeon, who may be faster on some days and slower on others. The anaesthesiologist is involved: besides any unexpected difficulties encountered by the surgeon, the anaesthesiologist may also come

across clinical problems that are hard to forecast. The nursing staff is involved insofar as their duty is to prepare successive trays of sterile surgical instruments, and the porters have to be instructed a little before the end of one procedure to go and fetch the patient so he or she is ready to enter the Operating room at the right time for the next one. Cleaners then clean (sanitise) floors before the next patient enters the operating room.

Lack of coordination, in this example, leads to operating rooms being used for longer than necessary; cost efficiency levels vary, and so do waste levels between one surgical team and another.

1.5.Inventory: anything that is waiting, or waiting to be used

“Inventory” defines anything that is waiting (in storage) for an event to take place. There is no added value to this time. Inventory occupies space and requires maintenance. Empty beds, stockpiles of drugs close to their use-by date, specimens awaiting analysis, patients awaiting results, results waiting to be reported. X-rays waiting to be reported. Blood samples taken and processed but never used. Operating rooms waiting for urgent surgical procedures.

Umpteen examples could be listed every single day.

1.6. Inefficient movement of people: movement is not work

There is obviously a dire need to improve and optimise equipment, but human work needs optimising even more urgently because by enhancing harmony, coordination and synergy between people who are working, it is possible to increase efficiency and reduce waste by 30-50%. What does improving human work mean? It means giving every action a purpose. Harmonising every movement with the process we are developing. Moving frequently gives people the impression they are doing something, but when people come together and decide jointly on how to perform a job, more often than not it turns out that it can be done more efficiently and with fewer movements. At the end of the day, improving personnel flows means reducing movements, minimising fatigue and completing processes effortlessly and without racing against the clock. It is far better to estimate needs and priorities beforehand than have to speed up the pace to catch up. It is amazing how many people wander about hospitals without following a definite schedule, and without the aim of completing their work within a certain time. I’m not saying people should be rushing, but at least they should have an objective and a deadline for achieving it. At equal output, rationalising the distance (sometimes miles) covered in hospitals could lead to significant savings in energy and, above all, time. Ultimately, we would all work less. Learning to see waste is an exercise that can start by watching how - and how much - people move, so work is not wasted by people rushing about aimlessly

1.7.Inefficiencies and errors

Believing that facilities that have the latest technology also offer the highest quality is a mistake. Quality means working efficiently and effectively. Efficiency means working in environments in which everything flows smoothly without disruptions or inefficiencies, on time and as scheduled, people are courteous, there are no unsolved organisational squabbles, and results are achieved with whatever resources are available. Efficiency becomes effectiveness when performance matches objectives. Quality, therefore, corresponds to a lack of errors and inefficiencies through flexible and speedy relations among the resources used, adopting the best approaches towards utilising them, achieving results with these same resources and lastly, matching results with the objectives set by the hospital.

Conversely, we all tend to think that mistakes and inefficiencies are inevitable. However, in view of the error rate in health care due to organisational and system related problems (80%) rather than human factors (20%), and considering how many improvements the approaches described here could determine, it is simply impossible to go on ignoring them.

1.8.Misaligned processes

The first duty of an organisation is to align its processes, control them and study them as part of the flow of value. The first weakness of hospitals is that their most important processes lack a written and

shared definition. Another weakness is not fully identifying value in the process. The third is not timing the speed of the process, in other words, not seeing the flow.

In surgery, these are the main processes:

- ◆ Organising pre-admission
- ◆ Surgical outpatient clinics
- ◆ Emergency admissions
- ◆ Elective admissions (R.A. = Routine Admission, D.S.-ODS = Day Surgery and One Day Surgery, COP= Complex Outpatient Packages).