PUBLIC HEALTH FOUNDATION OF INDIA

ASSOCIATION OF HEALTHCARE PROVIDERS INDIA

Indian Institute of Science

Indian Institute of Space Science and Technology

Certificate Course in

Healthcare Technology (CCHT)

Module 3: Technology-led Health Care Part-2

Quality Management Using Technology in Healthcare

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Quality Management Using Technology in Healthcare

Learning Objectives:

- To understand the importance of quality in healthcare
- To explore how technology has contributed to healthcare quality
- Understanding key attributes of healthcare quality.
- To explore importance of quality planning, quality assurance, quality control and quality improvement in context of healthcare.

Overview of Session:

- Challenges in the context of Healthcare industry
- Brief history of quality movement in healthcare
- History of how technology has contributed to healthcare quality
- Definition of Healthcare quality
- Attributes of Healthcare quality
- Quality management
- Case studies on concepts learned.

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1. Challenges in Healthcare industry

1. Highly competitive industry
2. Exponential growth of new and advanced techniques in medical field
3. Increasing customer expectations and consciousness

4. No room for error as it is question between life and death
5. Governmental regulations
6. Healthcare costs continue to rise
7. Hospital administration is more complex any other business enterprise

2. Pioneers of quality moment in healthcare

Chronological summary of some key individuals in building healthcare quality[1]

Year(s)	Contributor	Key contributions	Country of Origin
1858	Florence Nightingale	Quality improvement documentation	England
1861	Clara Barton	Sanitary commissions	USA
1862	Louis Pasteur	Pasteurization	France
1879	Charles Chamberland	Sterilization	France
1881	Louis Pasteur	Vaccination for Anthrax	France
1883	Chancellor Otto Von Bismark	Healthcare financing	Germany
1885	Louis Pasteur	Vaccination for Rabies	France
1895	Roentgen	X-rays	Germany
1910	Abraham Flexner	Medical Education	USA
1910s	Henry Ford	Industry and Mass Production	USA
1920s	Walter Shewhart	Statistical Quality Control	USA
1928	Alexander Fleming	Discovery of Pencillin	England
1950s	Deming	PDCA cycle-Quality Revolution in Japan	USA
1950s	Juran	Quality Triology- Quality Revolution in Japan	USA
1956	Dr.Peter Safar	ABC technique for Cardiopulmonary resuscitation; 24 hour intensive care unit	USA
1966	Dr.Avedis Donabedian	Systems model of healthcare quality	USA, Lebanon

1. Sheingold, B.H. and Hahn, J.A., 2014. The history of healthcare quality: The first 100 years 1860–1960. *International Journal of Africa Nursing Sciences*, *1*, pp.18-22.

3. Attributes of healthcare quality[2]

Health care quality is the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes. Quality of care plays an important role in describing the iron triangle of health care relationships between quality, cost, and accessibility of health care within a community. Researchers measure health care quality to identify problems caused by overuse, underuse, or misuse of health resources. In 1999, the Institute of Medicine released six domains to measure and describe quality of care in health.

- safe – avoiding injuries to patients from care that is intended to help them
- effective – avoiding overuse and misuse of care
- patient-Centered – providing care that is unique to a patient's needs
- timely – reducing wait times and harmful delays for patients and providers
- efficient – avoiding waste of equipment, supplies, ideas and energy
- equitable – providing care that does not vary across intrinsic personal characteristics

While essential for determining the effect of health services research interventions, measuring quality of care poses some challenges due to the limited number of outcomes that are measurable. Structural measures describe the providers' ability to provide high quality care, process measures describe the actions taken to maintain or improve community health, and outcome measures describe the impact of a health care intervention. Furthermore, due to strict regulations placed on health services research, data sources are not always complete.

Assessment of health care quality may occur on two different levels: that of the individual patient and that of populations. At the level of the individual patient, or micro-level, assessment focuses on services at the point of delivery and its subsequent effects. At the population level, or macro-level, assessments of health care quality include indicators such as life expectancy, infant mortality rates, incidence, and prevalence of certain health conditions.

4. Quality management[3]

Quality management ensures that an organization, product or service is consistent. It has four main components: quality planning, quality assurance, quality control and quality improvement. Quality management is focused not only on product and service quality, but also on the means to achieve it. Quality management, therefore, uses quality assurance and control

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2. https://en.wikipedia.org/wiki/Health_care_quality

3. https://en.wikipedia.org/wiki/Quality_management

of processes as well as products to achieve more consistent quality. What a customer wants and is willing to pay for it determines quality. It is a written or unwritten commitment to a known or unknown consumer in the market. Thus, quality can be defined as fitness for intended use or, in other words, how well the product performs its intended function.

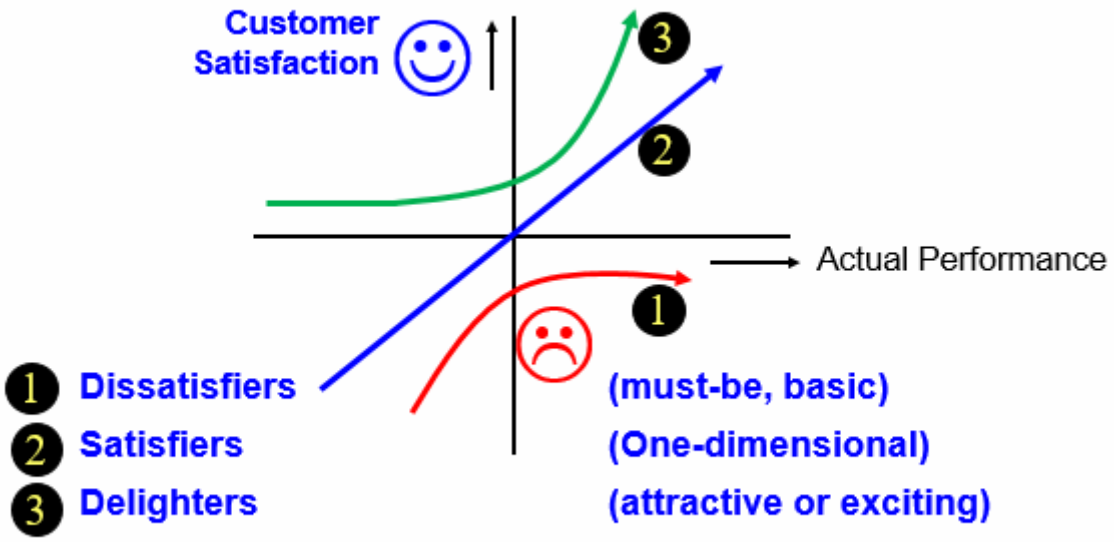
5. Kano's Model[4]

The Kano Model of product development and customer satisfaction was published in 1984 by Dr Noriaki Kano, professor of quality management at the Tokyo University of Science.

Kano says that a product or service is about much more than just functionality. It is also about customers' emotions. For example, all customers who buy a new car expect it to stop when they hit the brakes, but many will be delighted by its voice-activated parking-assist system.

The model encourages you to think about how your products relate to your customers' needs, while moving from a "more is always better" approach to product development to a "less is more" approach.

Constantly introducing new features to a product can be expensive and may just add to its complexity without boosting customer satisfaction. On the other hand, adding one particularly attractive feature could delight customers and increase sales without costing significantly more.



The model assigns three types of attribute (or property) to products and services:

1. Threshold Attributes (Basics). These are the basic features that customers expect a product or service to have.

4. https://www.mindtools.com/pages/article/newCT_97.htm

2. Performance Attributes (Satisfiers). These elements are not absolutely necessary, but they increase a customer's enjoyment of the product or service.

3. Excitement Attributes (Delighters). These are the surprise elements that can really boost your product's competitive edge. They are the features that customers don't even know they want, but are delighted with when they find them.

6. Quality assurance

Quality Assurance (QA) focuses on preventing defect. It ensures that the approaches, techniques, methods and processes are designed and implemented correctly. Quality Assurance is a proactive process and is Prevention in nature. One of important techniques of ensuring quality assurance is the concept of Pokayoke.

7. Pokayoke[5]

This is a Japanese word that means mistake proofing of equipment or processes to make them safe and reliable. These are simple, yet effective design features that make it almost impossible for errors to occur.

The aim of mistake-proofing is to remove the need for people to think about the products or processes they are using. This is because the products have a design that makes it impossible to use them in the wrong way.

When someone uses the product the wrong way, it does not function and it becomes obvious to the user that they are doing the wrong thing. The simple yet effective design features make it difficult for errors to occur during usage of the product.

The concept developed out of the need to achieve quality in production processes. It was Shigeo Shingo, one of the pioneers of the Toyota Production System, who proposed the concept. He was a quality guru who proposed the idea of 'Zero Defects' as a quality paradigm. The thinking was that a process should be able to detect and prevent errors from occurring. This would lead to a final product of high quality.

Poka Yoke Examples

Products that we use every day have features that make them safe and convenient.

5.**https://leanfactories.com/poka-yoke-examples-error-proofing-in-manufacturing-daily-life/**

The following are a few examples of how mistake-proofing is used for everyday household products:

Micro-wave oven does not work until the door is shut.

- Washing machines only start when the door is closed and cannot be opened until the cycle is over.

- Electric plugs have an earth pin that is longer than the other pins and is the first to make contact with the socket. The protective shield of the neutral and earth sockets are then opened safely.
- Electric sockets are shaped in a manner that only one way of plugging-in is possible. This prevents the possibility of a short-circuit occurring.

- Elevator doors have a sensor that causes them to open when there is an obstruction-this prevents injury to someone trying to enter as the doors are closing.
- The Door of a washing machine or dryer makes the machine stop when it is opened, so as to prevent injury from accidents

Mistake-proofing also occurs in natural systems and the human body system is a good example of how it works to prevent errors from occurring:

- Coughing is a natural reaction that prevents the error of foreign bodies from entering into the lungs. The sensitive wall linings of the respiratory tract detect and eject minute particles through coughing.
- Veins have valves that are designed to prevent the error of back-flow of blood as it travels through the system. They also allow some blood to collect within the system without busting as they have a larger internal diameter.
- Arteries have thick walls that can withstand the high pressure that blood from the heart exerts on the circulatory system.
- Tearing is a necessary reaction to the entry of foreign bodies into the eye.
- Mucus membrane traps bacteria and prevents the error of pathogens entering the system.
- The skin is the first defence against entry of foreign bodies and the oils and enzymes prevent harmful bacteria into the human body.
- Inflammation reaction of swelling happens when blood vessels leak fluid into the tissues. The chemicals attract white blood cells (phagocytes) that eat germs and dead/ damaged cells. This reaction prevents the spread of harmful toxins and pathogens to the rest of the human body and is a form of natural error-proofing.

8. Quality Control

Quality control (QC) is a process through which a business seeks to ensure that product quality is maintained or improved. QC involves testing of units and determining if they are within the specifications for the final product. QC is a reactive process and is detection in nature. Quality Control has to complete after Quality Assurance.

9. Six sigma[6]

Six sigma originated in manufacturing division of Motorola Corporation. Sigma (*s*) denotes standard deviation, i.e. variations around the mean value on a normal curve. It is a management philosophy that aims to improve operating efficiency by minimising waste and eliminating rework. It thus increases the competitiveness of an organisation. Six sigma is a measure of goodness involving heavy application of statistical methods to improve existing business processes. It aims to reduce quality problems to less than 3.4 Defects per Million Opportunities (DMPO) or better. Table below compares the DMPO for various sigma levels.

Sigma level	Defects per million opportunities (DMPO)
1 σ	6,90,000
2 σ	3,08,537
3 σ	66,807
4 σ	6210
5 σ	233
6 σ	3.4

10. Quality improvement

Quality improvement refers to the combined and unceasing efforts of everyone to make the changes that will lead to better patient outcomes (health), better system performance (care) and better professional development (learning)". Benchmarking is one of important techniques used by organizations for quality improvement.

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6. Ravi, V., 2015. *Industrial Engineering and Management*. PHI Learning Pvt. Ltd..

11. BENCHMARKING[6]

Organisations that initiate TQM or any other world best manufacturing practices should have a basis for establishing its performance. This basis of performance may be the best in industry and may be termed as *benchmarks*. Benchmarking can be defined as "a process of continuously measuring and comparing an organisation's business process against business leaders anywhere in the world to gain information which will help an organisation to take action and improve its performance".

Process of benchmarking attempts to determine critical success factors in a business. It is essential to do a careful analysis of key processes to identify and fill in the gaps with respect to benchmarked business. This exercise helps companies to identify where improvements and innovations are needed for improving its performance. It is necessary that performance or improvement must be measured on regular basis for establishing success in benchmarking endeavours.

11.1 Benefits of benchmarking

An organisation can benefit a lot from benchmarking efforts. Some benefits of benchmarking are:

1. It enables an organisation to set realistic performance targets for its survival and growth in competitive environments.
2. It avoids reinventing the wheel. Adopting methods that are already successful in another company results in substantial saving in terms of costs and time.
3. It provides a basis for accelerating change and restructuring of an organisation.
4. Training needs of employees can be determined.
5. It makes implementation more acceptable because of involvement of process owners.

11.2 Types of Benchmarking

Benchmarking is classified based on the type of partner selected for it. The partnering team may be from the same company or from a different organisation. Important types of benchmarking are:

1. **Internal benchmarking*:*** It is one of the simplest, quickest and cheapest type of benchmarking. In *internal benchmarking*, internal processes of a company within or across its units are compared for performance. The biggest advantage of this type of benchmarking is that all data and information required for benchmarking processes are readily available. Also, establishing communication among various units of organisation is readily possible. Main disadvantage of internal benchmarking is that as the organisation looks at their own processes, radical improvement may not be possible. Internal weaknesses inherent in system as cultural problems, leadership problems etc., remain unaltered. Thus, lack of external focus may result into complacency.

2. **Competitive benchmarking*:*** In this type of benchmarking, an organisation makes specific comparison of its processes, practices, styles and services against their competitors. This exercise is done to make suitable improvements in processes and practices so as to improve quality of their products as compared to competitors. One of the disadvantages of this method is that competitors are usually reluctant to share their data and trade secrets with any one. Secondary sources of data such as newspapers, trade magazines, seminars etc., may be used to collect relevant data for this type of benchmarking. Thus, by being informed of what their competitors are doing, a company can design and manufacture their products in a better manner. Companies often involve in reverse engineering to unfold processes from end product to raw material in their competitive benchmarking efforts.

3. **Functional benchmarking:** In functional benchmarking, a comparison of processes and functions are broadly made within the two or more organisations. Advantage of this benchmarking process is that it enables an organisation to find out ideas that have already succeeded in real time in same industry or industry leaders. Benchmarked company can know what other companies are following with respect to different activities by this exercise. This helps them in suitably adopting their superior practices.

4. **Generic benchmarking:** In generic benchmarking, best practices of reputed market leaders irrespective of business sector are identified. Benchmarking is performed against those very specific activities. The case of Xerox Corporation is a classic example of generic benchmarking, details of given below.

Generic benchmarking: Case of Xerox corporation

Sl. No.	Process	Benchmarked company
1	Billing and collection	American Express
2	Automated inventory control	American Hospital Supply
3	Manufacturing floor layout	Ford Motor Company
4	Warehouse operations	L.L. Bean
5	Warehouse and distribution efficiency	Mary Kay Cosmetics

References:

- Sheingold, B.H. and Hahn, J.A., 2014. The history of healthcare quality: The first 100 years 1860–1960. *International Journal of Africa Nursing Sciences*, *1*, pp.18-22.
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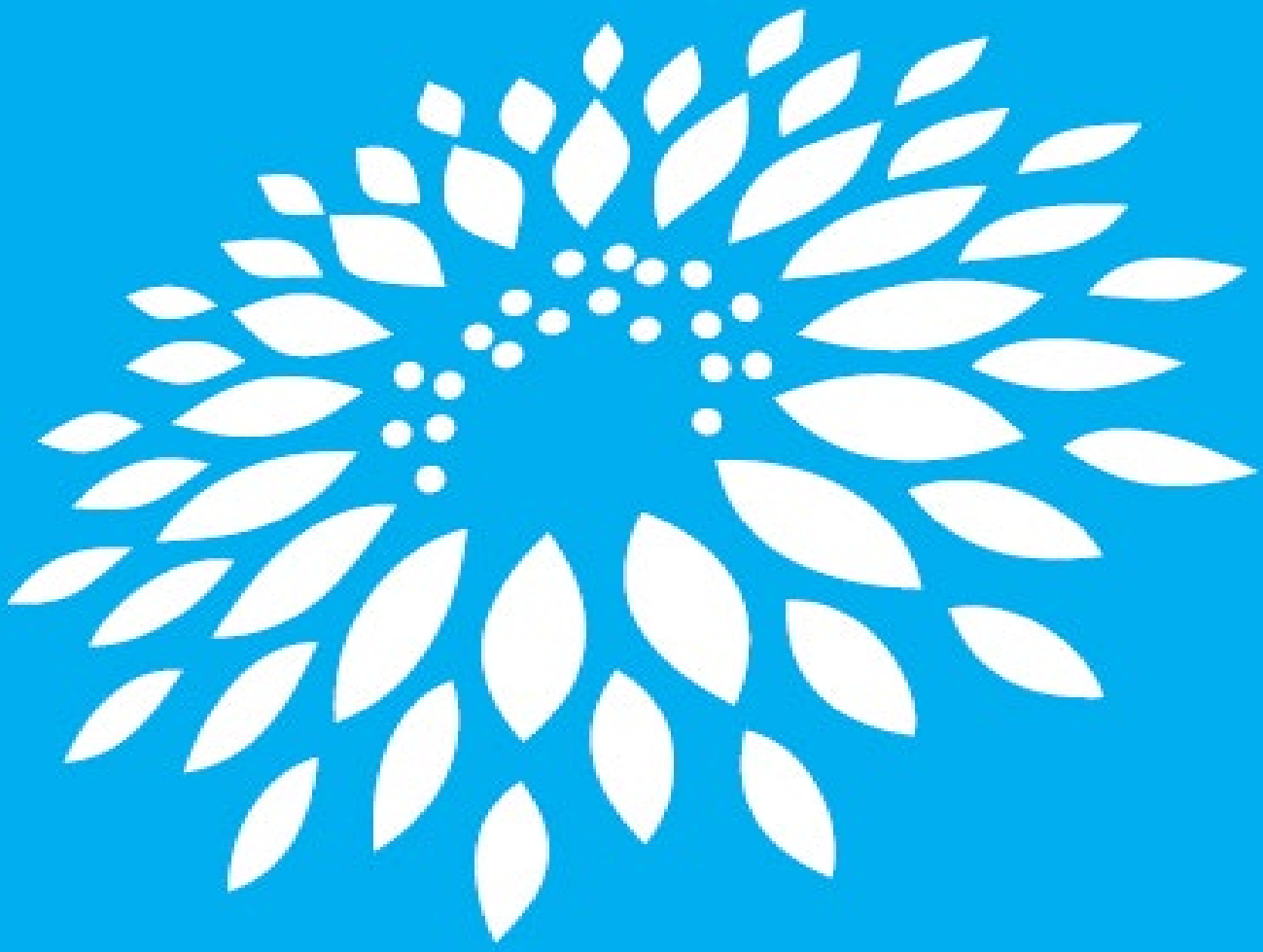
- Donabedian, A., 1966. Evaluating the quality of medical care. *The Milbank memorial fund quarterly*, *44*(3), pp.166-206.
- Donabedian, A., 2002. *An introduction to quality assurance in health care*. Oxford University Press.

Food for thought:

- Make a list of must-be, one dimensional and delighter criteria for inpatients in a hospital.
- List down pokayoke principles that are used in medical field in your area of specialization.
- Discuss how DMAIC methodology of six sigma would be helpful in reducing potential medical errors happening in healthcare.
- List down all possible areas where hospitals can apply generic benchmarking to improve upon their working processes.

Presentations



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CERTIFICATE COURSE IN HEALTHCARE TECHNOLOGY

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Dr.V.Ravi joined the Department of Humanities, Indian Institute of Space Science and Technology (IIST) in September 2010. Before joining IIST, he worked as Assistant Professor of Operations Management and Quantitative Techniques in Department of Management Studies, National Institute of Technology, Tiruchirappalli (2009-2010) and in Defence Research and Development Organization at Institute of Technology Management, Mussoorie (2006-2009) and in College of Engineering, Thiruvananthapuram (1999-2005). His biography has appeared in the 28th edition of "*Marquis Who's Who in World*" in 2011.

He has more than 20 years of experience teaching to graduate and postgraduate students. His current research focuses on areas of supply chain digitalization, sustainable supply chain management, reverse logistics, etc.. His research has resulted in 25 publications in peer-reviewed journals and conferences. His textbook on "Industrial Engineering and Management" has been published by Prentice Hall of India Learning Ltd.

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- Case studies on concepts learned.

Subtopics

- Quality Planning
- Quality Assurance
- Quality Control
- Quality improvement

Challenges in health care industry

- Highly competitive industry
- Exponential growth of new and advanced techniques in medical field
- Increasing customer expectations and consciousness
- No room for error as it is question between life and death
- Governmental regulations
- Healthcare costs continue to rise
- Hospital administration is more complex any other business enterprise

Pioneers of quality moment in healthcare

Florence Nightingale
1858

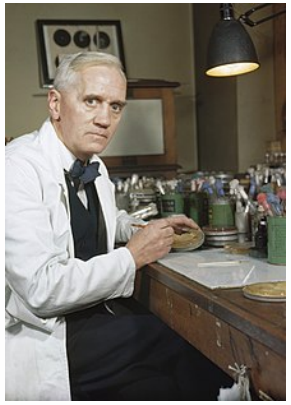
Clara Barton
1861

Louis Pasteur

Dr.Charles
Chamberland

Chancellor Otto
Von Bismark
1883

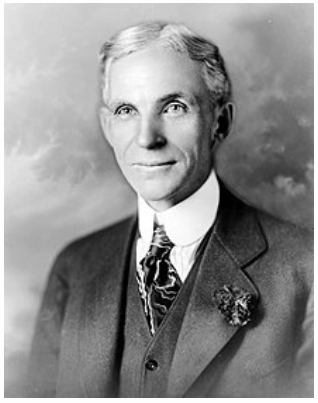
Conrad Roentgen
1895



Alexander Fleming
1928

Dr.Peter Safar
1956

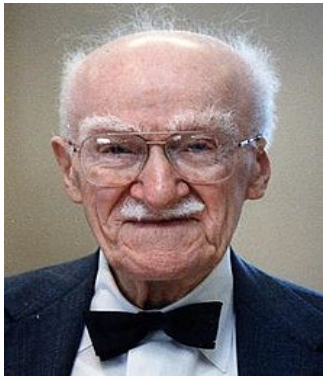
History of role of technology in improving the quality of healthcare



Henry Ford
1910

Walter Shewhart
1920s

Deming
1950



Juran
1950

JAPAN Quality
เลือกโตชิบา..
มาตรฐานญี่ปุ่น

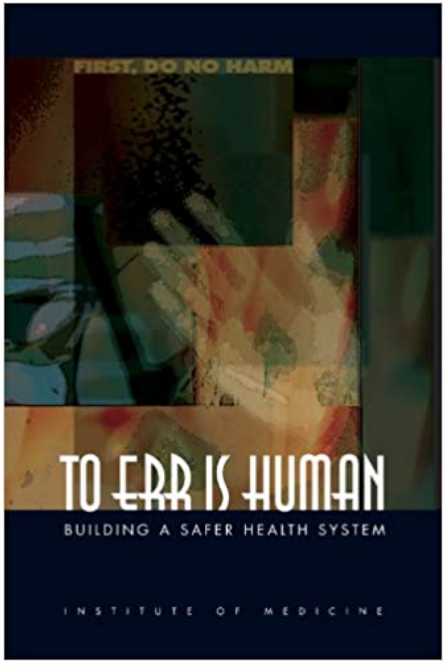
Quality Revolution
In Japan 1960s

Deming Medal

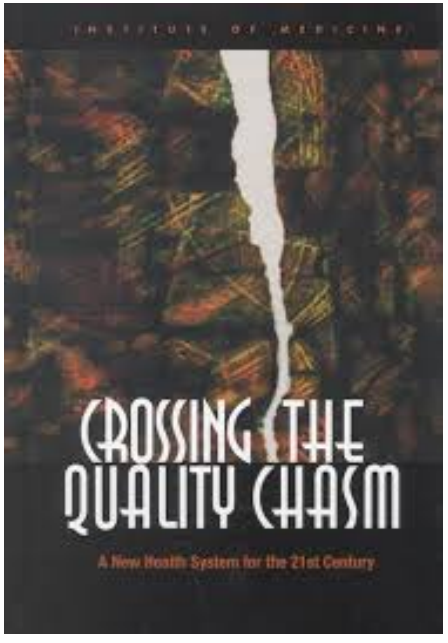
6σ

Late 1980s

Important reports on healthcare quality



1999: Problem is not bad people in health care--it is that good people are working in bad systems that need to be made safer.



2001: Crossing the Quality Chasm identified and recommended improvements in six dimensions of health care: patient safety, care effectiveness, patient-centeredness, timeliness, care efficiency and equity.

Definition of quality in healthcare sector

- The application of medical science and technology that promotes all the possible health benefits, without increasing the risk.

  - Avedis Donabedian

- The provision of diagnostic and therapeutic instruments capable of ensuring the best possible result in the health sector, aiming to the maximum patient satisfaction at the lowest risk.

  - World Health Organization (WHO)

- The degree to which health services for individuals and populations increase the likelihood of desired health outcomes including the current professional knowledge.

  - Institute of Medicine (IOM)

Attributes of Healthcare quality (IOM)

1. Safe
   - ❖ Avoiding preventable injuries, reducing medical errors
   - ❖ Medical care should make patients healthier and not cause them harm.
2. Effective
   - ❖ Providing services based on scientific knowledge
   - ❖ Provide services that benefit the patient.
   - ❖ Don't withhold services they need and don't push treatments that won't make a difference.
3. Patient- Centered
   - ❖ Care that is respectful and responsive to individual needs
   - ❖ The patient's preferences, needs and values should guide all clinical decisions.
4. Efficient
   - ❖ Quality goes up if you don't waste equipment, supplies, energy, times or ideas.
5. Timely
   - ❖ Reducing wait times and delays, improving the flow of processes
   - ❖ Delays can be harmful and reducing them benefits the patients.
6. Equitable
   - ❖ Regardless of your patient's class, gender, ethnicity, or other personal characteristics, the quality of care should stay the same.

Quality management in healthcare

Quality management

- Quality management is the act of overseeing all activities and tasks needed to maintain a desired level of excellence.
- Quality management has four main components:
    1. Quality planning
    2. Quality assurance
    3. Quality control and
    4. Quality improvement.

Quality Planning

- Quality planning is determining the activities required for "developing the products, systems, and processes needed to meet or exceed customer expectations."
- This includes defining who the customers are, determining their needs, and developing the tools (systems, processes, etc.) needed to meet those needs.

Why some hospitals fail to satisfy the need of customers?

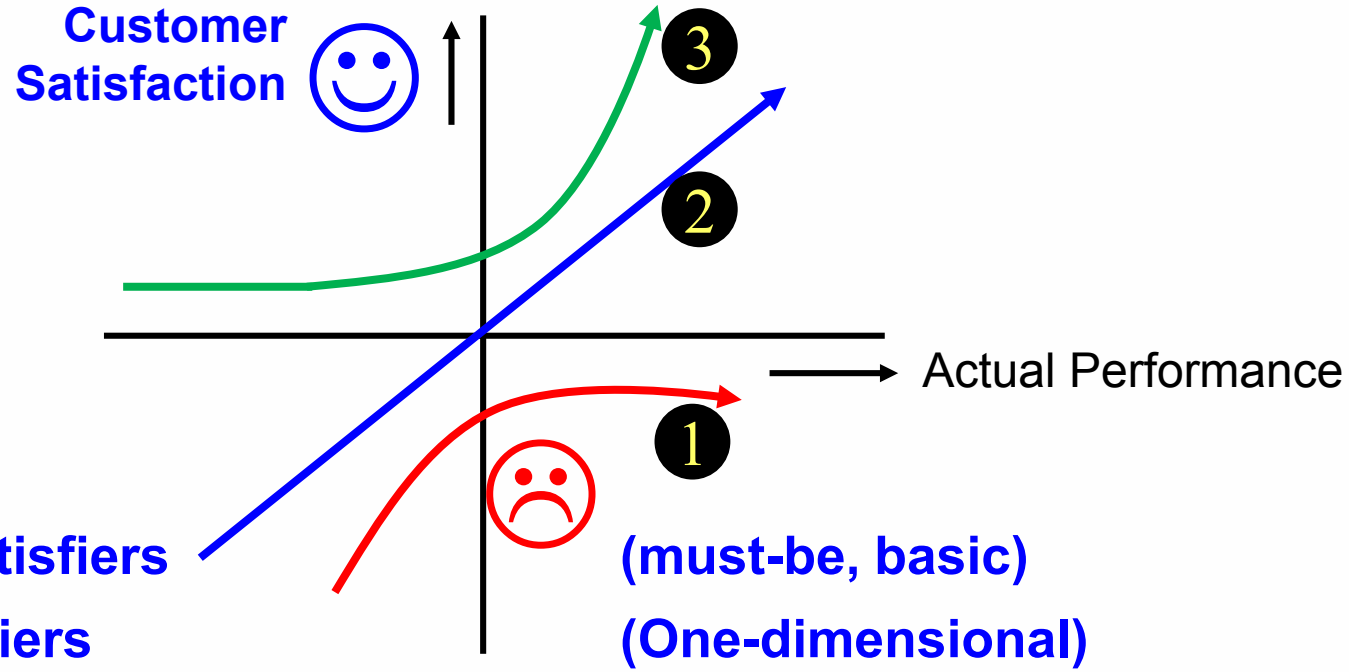
- Not understanding the following:
  - What are the customer needs?
  - What the customer like in competitor's hospitals?
  - What quality the customers prefer in the hospitals?
  - Does our hospital processes support to achieve customers needs for achieving this quality?
  - Are the customer requirements ever changing?

Defining the customer

- External customers: include patients, patients' families and visitors, referring physicians, blood donors, third-party insurance companies, etc.

- Internal customers: include doctors, nurses, staff, technicians, intern students, trainees, departments, committees, etc.

Kano's model



1. **Dissatisfiers** **(must-be, basic)**
2. **Satisfiers** **(One-dimensional)**
3. **Delighters** **(attractive or exciting)**

Dissatisfiers

- **Dissatisfiers are the absence of "expected quality".**

Expected quality	Dissatisfiers
Hospital has state of art medical equipment	Hospitals have outdated medical equipment
Safety clinical procedures followed in hospital	Hospitals do not follow safety procedures
Clear signboards for going to various departments	Sign boards to departments not seen
Adequate parking for vehicles available	Parking facility for vehicles not available

Satisfiers

- Satisfiers are something that customers want in their products, and usually ask for.
- We can expect the satisfiers to be present in all the competitive products, to a greater or lesser extent.

Desired quality (Customer Need)	Performance Measurement	Direction of Goodness
Waiting time in OPD	Time	Smaller the better
Admission time	Time	Smaller the better
Breakdown of equipment in hospitals	Time	Smaller the better
Internet Access	Internet speed	Larger the better
Cost of treatment	Rupees	Smaller the better
Discharge time	Time	Smaller the better
Response of doctors/staff in emergency department	Time	Faster the better

Delighters

- Delighters are product attributes or features that are pleasant surprises to customers when they first encounter them.
- If delighters are not present, customers will not be dissatisfied, since they will be unaware of what are missing.
  - App for hospital wide services
  - Online medicine indenting and dispatching
  - Play area for kids

2. Quality Assurance

- Quality Assurance (QA) focuses on preventing defect.
- It ensures that the approaches, techniques, methods and processes are designed and implemented correctly.
- Quality Assurance is a proactive process and is Prevention in nature.
- One of important techniques of ensuring quality assurance is the concept of Pokayoke.

Pokayoke

- The concept was formalised, and the term adopted, by Shigeo Shingo as part of the Toyota Production System.
- Poka-yoke is a Japanese term that means "mistake-proofing" or "inadvertent error prevention".
- Its purpose is to eliminate product defects by preventing, correcting, or drawing attention to human errors as they occur.
- This concept finds wide applications in human body and also in medical field.

Pokeyoke simple examples

Car

Microwave Oven

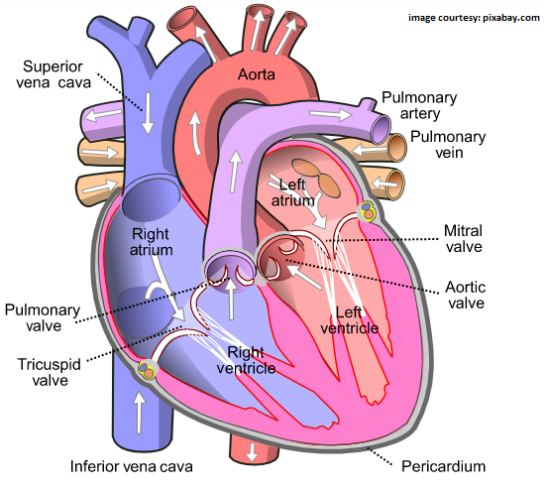
Washing machine

USB Cable

Lifts and elevators

Spell check

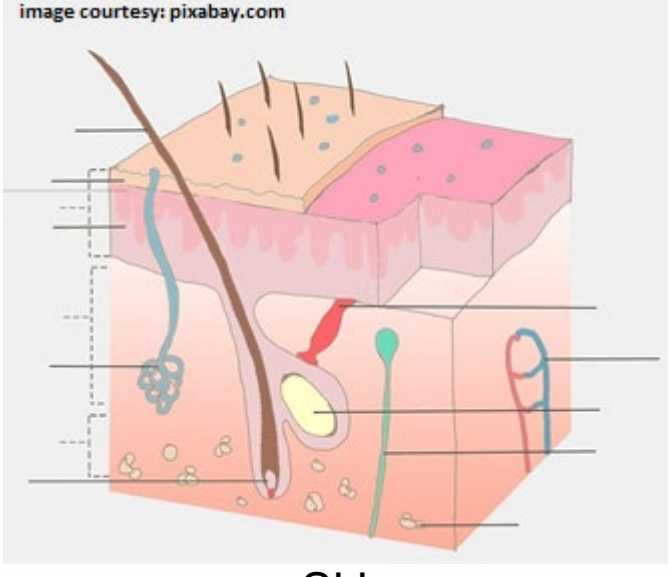
Pokayoke examples in human body



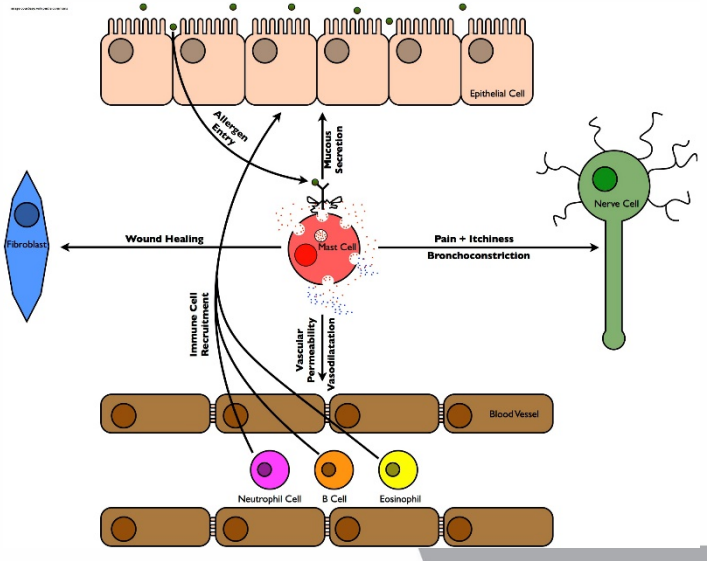
Arteries and Veins

Cough

Tearing of eyes

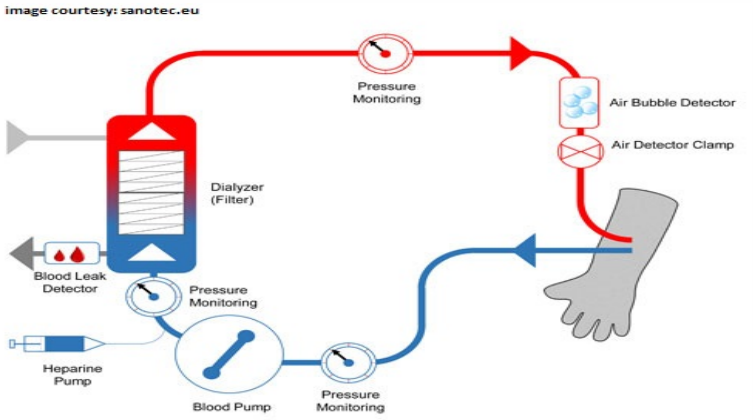


Skin



Inflammation reaction

Poyayoke examples in medical field



Air bubble detector in dialysis machine

Installation of battery pack in defibrillator

Wheelchairs

At hospital design stage installation of

- Hand bars, anti skid tiles inside the washroom
- Handrails across patient movement areas

3. Quality Control

- Quality control (QC) is a process through which a business seeks to ensure that product quality is maintained or improved.
- QC involves testing of units and determining if they are within the specifications for the final product.
- QC is a reactive process and is detection in nature.
- Quality Control has to complete after Quality Assurance.

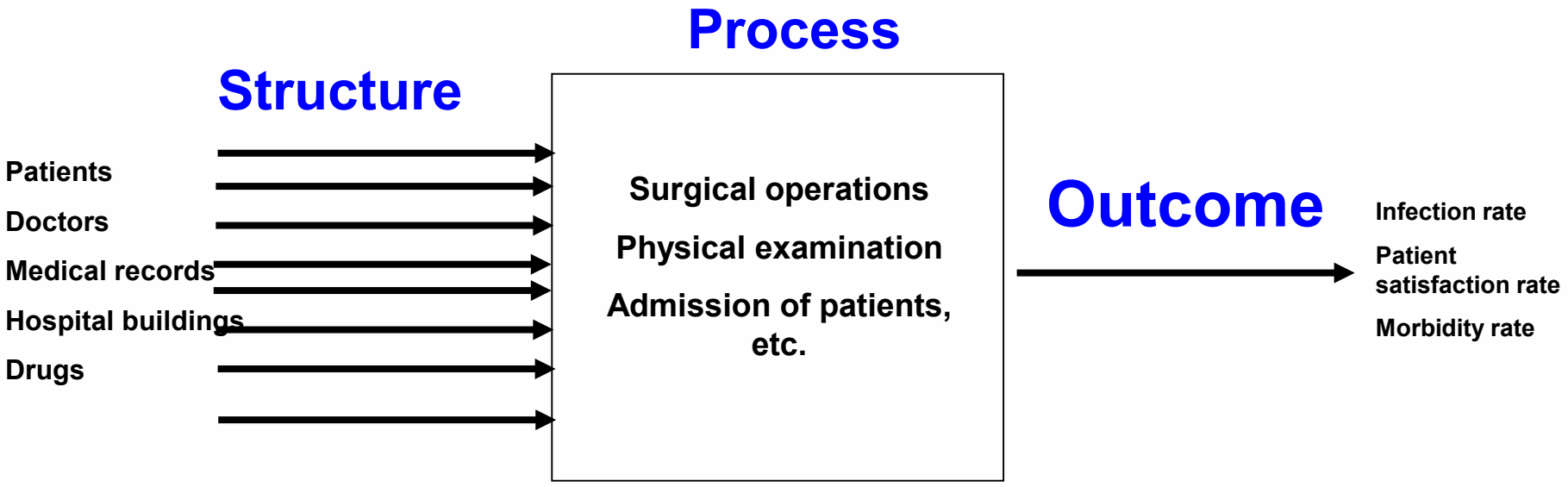
What is common among all these companies?

All these companies follow 6 sigma approach

Six sigma

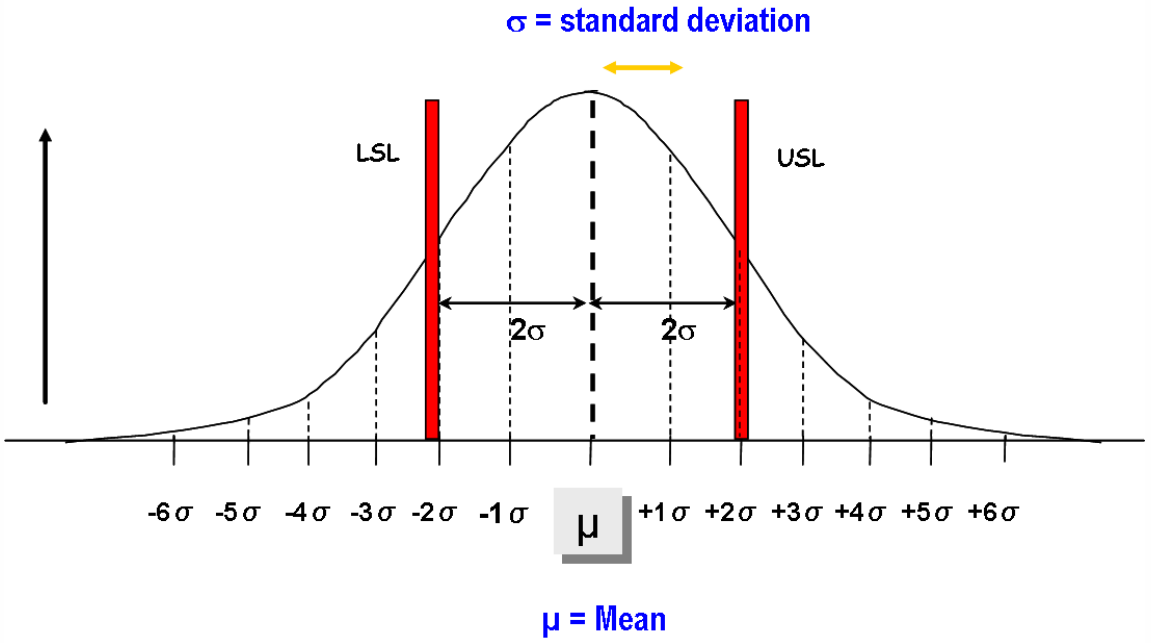
- Six sigma aims for world class quality and performance.
- Is both a quality management philosophy and a methodology that focuses on:
  1. Reducing variation
  2. Measuring defects
  3. Improving quality of processes, products, and services
  4. Instilling a philosophy of continuous improvement

Donabedian Systems model in healthcare



What is six sigma?

- Sigma (σ) is a statistical concept that represents how much variation there is in a process relative to customer specifications.
- Sigma measures degree of variance from the average.
- Sigma Value is based on "defects per million opportunities" (DPMO).
- Process/Product performance, i.e., variation from the target value is depicted as a normal distribution.



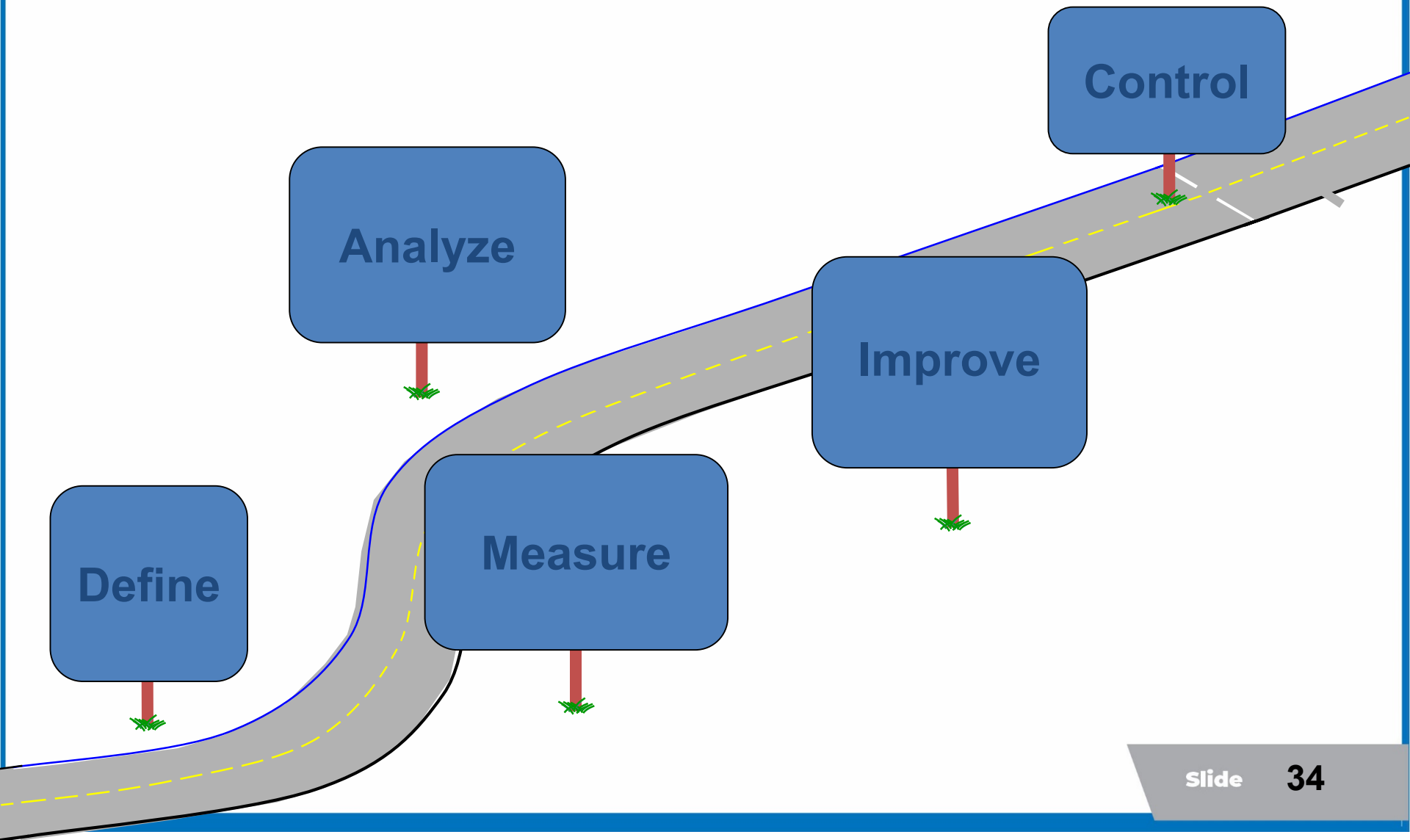
Sigma Performance Levels – One to Six Sigma

Sigma level	DPMO	Yield (or produced or delivered) correctly
1σ	6,90,000	30.85 %
2σ	3,08,000	69.146 %
3σ	66,800	93.319 %
4σ	6,210	99.379 %
5σ	230	99.9767 %
6σ	3.4	99.9997 %

What's Wrong With 99% Quality?

3.8 Sigma *99% Good*	*Six Sigma* *99.9997% Good*
■ **Unsafe drinking water for almost 15 minutes each day**	■ **Unsafe drinking water for 1 minute every 7 months**
■ **5,000 incorrect surgical operations per week**	■ **1.7 incorrect surgical operations per week**
■ **200,000 wrong drug prescriptions dispensed each year**	■ **68 wrong drug prescriptions dispensed each year**

The Powerful DMAIC Road Map for six sigma



DMAIC approach for six sigma

- Define
  - Define the customers and their requirements
  - Define project boundaries
  - Define the process to be improved
- Measure
  - Performance of the Core Business Process involved is measured.
- Analyze
  - Gaps between current performance and goal performance
  - Identify sources of variation
- Improve
  - Target process is improved by designing creative solutions to fix and prevent problems.
- Control
  - Improvements are controlled to keep the process on the new course

Successful examples of applications of 6 sigma in Healthcare

Organization	Project	Outcome of 6 sigma
Charleston Area Medical Center	Supply chain for surgical supplies	Lower inventory, improved supplier relations
CommonWealth Health Corporation	Radiology	Decreased time between dictation and signature, improved wait time and staff scheduling
Froedtert Memorial Lutheran Hospital	ICU lab times	Reduced turnaround times
Scottsdale Healthcare	Overcrowded ED	Improved transfer time from ED to impatient hospital bed

4. Quality Improvement

- "The combined and unceasing efforts of everyone to make the changes that will lead to better patient outcomes (health), better system performance (care) and better professional development (learning)".

- Benchmarking is one of important techniques used by organizations for quality improvement.

Benchmarking

- It is a process of continuously measuring and comparing one's business processes against comparable processes in leading organizations to obtain information that will help organization identify and implement improvements.
- It stresses on:
  - *Structured process*
  - *Comparing both business processes and performance measures*
  - *External focus*
  - *Learn from others*
  - *Change, not just evaluate*

Classification of benchmarking methods

- Internal benchmarking
- Competitive benchmarking
- Functional benchmarking
- Generic benchmarking

Internal Benchmarking

- When an organization is large enough to have many divisions or business units, a natural approach is the internal benchmark.
- Data are usually much more accessible than from outside firms.
- Typically one internal unit has superior performance worth learning from.
- This is the first kind of benchmarking any company should do.
- Big limitation is that one is simply looking at one's own processes and thus radical improvements may not be possible.

Internal Benchmarking example: from industry

- Xerox Europe, a $6 Billion subsidiary of Xerox Corp, formed teams to see how better sales could result through internal benchmarking.
- Somehow, France sold five times as many colour copiers as did other divisions of Europe.
- By copying France's approach, namely better sales training and use of dealer channels to supplement direct sales, Norway increased sales by 152%, Holland by 300% and Switzerland by 328%.

Internal Benchmarking application in hospital

- For example, if a hospital wants to improve handwashing and sanitizing practices to prevent infections, they may use internal benchmarking to evaluate current practices in each department and then set goals for 100% hand hygiene compliance throughout the hospital.

Competitive Benchmarking

- It involves comparison between specific competitors for the product or function of interest.
- Not an easy thing to do.
- A competitor generally does not give data on his company and its processes.
- Secondary sources could be used for getting potential information.

Functional benchmarking

- Involves comparison of similar functions within the same broad industry or with industry leaders.
- The benchmarking partners, therefore need not be in direct competition.
- This benchmarking process compares similar practices to those within a different organization.

Functional Benchmarking-Cleanliness

- British Rail Network employed a benchmarking process to improve the standard of cleanliness on trains.

- British Airways was selected as a partner because a team of 11 people cleaned a 250 seat jumbo aircraft in only 9 min.

- After the benchmarking exercise, a team of ten people was able to clean a 660 seat British Rail train in 8 min.

Generic Benchmarking

- It is not always necessary to learn only from the firms that are competing or those that fall within one's general industry.
- Some processes are same regardless of the dissimilarities of industries.
- It refers to the comparisons of business function that are same regardless of business.
- It is believed to be easier to obtain data in such arrangements, as best in class organisations are more likely to share their experiences.

Xerox generic benchmarking case study (More than 300 companies were studied)

Process	Company
Ordering and warehouse operations	L.L.Bean: Xerox noticed that they were able to pick orders three times as fast as it could.
Automated inventory control	American Hospital Supply
Manufacturing floor layout	Ford Motor Company
Manufacturing operations	Saturn (Unit of GM) and Fuji Xerox
Warehouse and distribution efficiency	Mary Kay Cosmetics
Barcoding and warehouse controls	Westinghouse
Employee involvement	Proctor and Gamble
Quality improvement	Florida Power and light
High Volume production	Toyota
Billing and Collection	American Express
Daily scheduling	Cummins Engine
Supplier development	Honda
Research and Development	HP
Manufacturing safety	DuPont

Generic benchmarking-example

- Hospitals in US routinely benchmark their patient management against hotel's guest management.
- The Ritz-Carlton Hotel Co., had good approaches to employee training, room service, custodial services, customer orientation and quality metrics.
- Disney is well known for employee training and customer orientation—both important to hospitals.
- Both of these organizations were used as benchmark standards by Bronson Methodist Hospital in Kalamazoo

Case study of Aravind Eye Hospital (1)

- In America, McDonald's, Dunkin' Donuts and Pizza Hut have all mastered the art of mass marketing.
- We have to do something like that to clear the backlog of 20 million blind eyes in India", prophesied Dr Venkataswamy, the founder of Aravind Eye Hospital, India.
- Aravind Eye Hopital was established in 1976 in a rented house with the mission to "eliminate needless blindness".
- Aravind is today the largest and the most productive eye care facility in the world.

Case study of Aravind Eye Hospital (2)

- Aravind got inspired by McDonalds, and wanted to market the cataract surgeries like hamburgers and standardise its offerings across locations.
- This idea was similar to what McDonalds did to its offerings in many parts of the world.
- Human eye is the same across the world and the treatment could be standardised for improved efficiency and consistency.
- Also, over the time Aravind realised that the processes that it implemented closely followed those of an automotive assembly line — from the entry of a patient into the system for eye surgery to the discharge after the surgery.
- Aravind later coined terms such as 'cycle time', 'reducing waste', 'bottlenecks', 'line efficiency' etc, in the new context to better understand the processes and focus on improvements.
- This is a classic case of use generic benchmarking in eye health care.

Potential areas where benchmarking can be done in healthcare for quality improvement

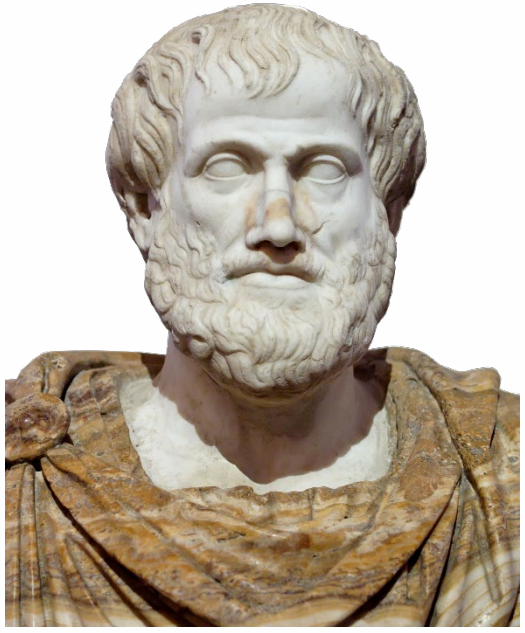
- Managerial areas: Pricing, Utilization, Productivity and efficiency, Revenue, Expenses, profitability
- Clinical areas: Ambulatory care, Anaesthesia services, Home care services, Pediatric services, Psychiatric services, Surgical services, House keeping services, Infection control program, Laundry and linen services.
- Process areas in operation theatre: Infection control, Temperature control, Productivity and efficiency, OT occupancy, OT scheduling
- Process areas: Patient scheduling, Preoperative screening, Materials management, Equipment management, Facility utilization, Labour utilization, Physical facilities, Instrument reprocessing

Recap

- In this module we have seen the importance of quality in healthcare.
- We discussed about attributes of healthcare quality.
- Quality management in medical care works to reduce medical errors and maximize patient care.
- We discussed concept of quality planning and use of Kano's model in healthcare for capturing customer requirements.
- Pokayoke or mistake proofing has immense potential in medical fields.
- Six sigma is a philosophy that needs to be followed by all organizations for improving quality.
- Benchmarking of processes can be used by hospitals for improving the quality.

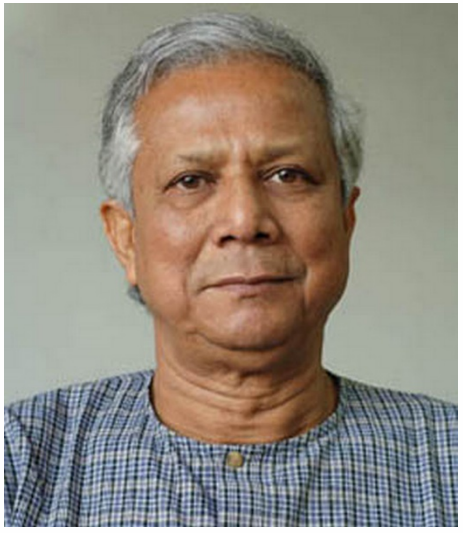
Take home messages

Quality is not an act, it is a habit.



Aristotle

Truly affordable but high quality healthcare tools and services are the only means by which quality healthcare can be provided to all.



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