Course: Knowledge is the enemy of unsafe care

Topic: Using quality improvement methods to improve care

Summary

High reliability organizations (HRO's) plan for failure by designing and operating systems that are 'fail-safe'. A range of quality improvement methods have been developed and used for decades in other sectors, such as engineering, applied psychology, physiology and management.

Patient safety has become a discipline with its own theoretical basis and safety science methods designed to measure adverse events and make sustainable improvements to safety. Health-care professionals may be less familiar with these methods. The goal of improving quality of care and safety involves changing the ways health-care providers and systems function, in order to achieve better patient outcomes. The central principle underpinning improvements in health care is that quality and safety are not controlled at the end of the line, but rather throughout the entire process.

What is quality improvement?

- Quality improvement (QI) methods have been used for decades in other industries. In contrast, health-care professionals may be less familiar with the goal of improving quality of care, which involves changing the way they and the systems function in order to achieve better outcomes.
- QI research uses methodologies that measure the features associated with an adverse event, the contextual components or the process of care that may result in an adverse event, and the development and testing of appropriate solutions.
- It is not enough that health-care providers recognize that adverse events occur. They also need to understand their causes and make the changes necessary to prevent further harm. A range of methods have been developed to help apply safety science methodologies in order to create a culture of safety in health care.
- Quality of care and patient safety requires understanding of the processes of patient care, as well as the ability to measure patient outcomes and test whether the interventions used to address a problem are effective. Without outcomes research and measurement, it is difficult to know whether the steps taken actually improved a given risk situation.
- Understanding the multiple causes of adverse events requires the use of methods and measurements designed to elicit all their likely causes and prevent such events from happening again.
- Health-care providers can begin to understand the role of quality improvement by:
  - asking and learning about tools that can be used to improve quality and patient safety;
  - being aware that the local environment is a key factor in the improvement process;
  - being aware that the ways that people in the system think and react are as important as the structures and processes in place;
  - realizing that the spread of new practices is a result of people adopting new processes;
  - understanding that measurements of patient outcomes are necessary for the design of appropriate strategies and for evaluating improvement.

Quality improvement: any process or tool aimed at reducing a quality gap in systemic or organizational functions
Guideline: a direct application of an abstract concept
Change concept: a general idea with proven merit and a sound scientific or logical foundation that can stimulate specific ideas for changes that lead to improvement

- Attempts to influence health-care professionals to modify their behaviour, such as ensuring compliance with protocols or promoting vigilance programmes, have been difficult to achieve.
- Many improvement methods have been designed to attempt to address this gap and provide health-care professionals with the tools to: (i) identify a problem; (ii) measure the problem; (iii) develop a range of interventions designed to fix the problem; and (iv) test their effectiveness.
- The identification and examination of each step in the delivery of health care clarifies how different factors are connected, interact and how they can be measured. Measurement is critical for safety improvement.

The science of improvement

W.E. Deming described the following four components of knowledge that underpin improvement: appreciation of a system; understanding of variation; the theory of knowledge; and psychology.

The four components form the system of knowledge underpinning improvement:

- ***Appreciation of a system:*** Patient care involves complex systems of interactions between health-care professionals, procedures and equipment, organizational culture and patients. Therefore, it is important to understand the interdependencies and relationships among these components (doctors, dentists, pharmacists, midwives, nurses, allied health professionals, patients, treatments, equipment, procedures, theatres and so on), thereby increasing the accuracy of any predictions about the impact of any change on the system.
- ***Understanding variation:*** Variation is the difference between two or more similar things and a basic feature of most systems. There is extensive variation in health care. Patient outcomes can differ from one ward to another, one hospital to another, one region to another and from one country to another. Shortages of personnel, equipment or beds, drugs etc, can add to variations.
- ***Theory of knowledge:*** Deming's theory of knowledge requires us to predict that changes will lead to better outcomes. Predicting the results of a change is a necessary step in the preliminary planning process. When health-care professionals have experience in the area they wish to improve, the changes they propose are more likely to result in improvements. Comparing results with predictions is an important learning activity. Building knowledge by making changes and then measuring the results or observing differences is *the basis of the science of improvement.*
- ***Psychology:*** Any change, large or small, will have an impact, and knowledge of psychology can help us understand how people might react and why they might resist change. The potential different reactions must be considered when change is being brought about.

Basic change concepts

A health-care team that wants to improve patient care may take an abstract concept (e.g. hand hygiene to reduce health care-associated infection) and attempt to apply it to the local environment, a particular situation or the task they are trying to improve. This process will take into account particular aspects of the local situation. This is an important step, because it engages the local team in the improvement process. Team members who take part in this step of the process will be more committed to the improvement project.

A guideline is a direct application of an abstract concept. By implementing a guideline, the health-care team will apply an abstract concept to the practical aim of improving an area of patient safety. If the change concept is abstract, then it should be backed by evidence.

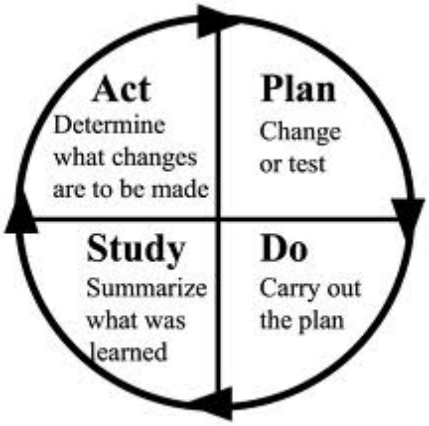
Improvement principles underline models for improvement

The basic principles of quality improvement are: patient/customer focus, strong leadership, involvement of all team members, use of a process approach, use of a systems approach to management, continuous improvement, a factual approach to decision-making and relationships that are mutually beneficial to all parties.

Quality improvement includes any process or tool aimed at reducing a quality gap in systemic or organizational functions. Most improvement models involve a questioning phase, followed by the PDSA cycle (Deming).

Key questions in any improvement process are:

1. ***What are we trying to accomplish?*** Asking this question helps to focus a team on the areas they are considering for improvement. It is important that everyone on the team agrees that a problem exists and that it is worthwhile to try fixing it.
2. ***How will we know whether a change constitutes or has resulted in an improvement?*** Outcomes/parameters in question need to be measured before and after the change, to see whether the actions taken have made a difference. Improvement can be confirmed when the collected data show that the situation has improved over time. Improvements have to be sustained before the team can be confident that their changes have been effective.



Source: Langley *et al.* (1996)

It is not unusual to use a trial-and-error approach in efforts to make a change for the better. This same approach underpins the PDSA process used to bring about improvements, both big and small.

Model for improvement

The cycle begins with a plan and ends with an action. The study phase is designed to elicit new information and knowledge. This is an important step in improvement science because new information allows for better predictions about the effects of changes. The application of the PDSA model can be simple or complex, formal or informal.

Issues to consider when building an improvement project

The following aspects need to be considered when planning to use an improvement method.

- ***A team needs to be established:*** Including the right people on a process-improvement team is critical to a successful improvement effort. Teams vary in size and composition, with each organization building teams to suit its own needs.
- ***The team needs to set out the aims and objectives of the improvement process:*** Improvement requires setting aims and objectives. Objectives should be time-specific and measurable and should also define the specific population of patients that will be affected.
- ***The team needs to establish how it will measure the changes*:** Teams use quantitative measures to determine whether a specific change actually leads to improvement.
- ***The team will need to select the changes to be made:*** All improvement requires change, but not all changes result in improvement. Organizations, therefore, must identify the changes that are most likely to result in improvement.
- ***The team needs to test the change:*** The PDSA cycle is shorthand for testing a change in the real work setting, including planning a change, trying it, observing the results and acting on what has been learnt. This is an example of the scientific method.
- ***The team needs to implement the change****:* After testing a change on a small scale, learning from each test and refining the change through several PDSA cycles, the team can implement the change on a broader scale—for example, for a whole health-care facility.
- ***The team needs to spread the changes:*** Successful implementation of a change or set of changes for a pilot population or an entire unit enables spreading these changes to other parts of the organization or to other organizations.

The role of measurement in improvement

Quality improvement activities require health professionals to collect and analyse data generated by the processes of health care.

	Measurement for research	Measurement for learning and process improvement
Purpose	To discover new knowledge	To bring new knowledge into daily practice
Tests	One large "blind" test	Many sequential, observable tests
Biases	Control for as many biases as possible	Stabilize the biases from test to test
Data	Gather as much data as possible "just in case"	Gather just enough data to learn and complete another cycle
Duration	Can take long periods of time to obtain results	Small tests of significant changes accelerate the rate of improvement

Source: Institute for Healthcare Improvement (http://www.ihi.org/IHI/Topics/Improvement/ImprovementMethods/Measures/

Measurement is an essential component of improvement as it forces researchers to look at what they do and how they do it. All improvement methods rely on measurement. Most activities in health care can be measured, yet they are not. There is strong evidence that when people use the appropriate tools to measure change, significant improvements can be made. There are three main types of measures used in improvement: outcome measures; process measures; and balancing measures.

- **Outcome measures:** Examples of outcome measures include frequency of adverse events, number of unexpected deaths, patient satisfaction surveys and other processes that capture patients' and their families' experiences.
- **Process measures:** Process measures refer to measurements of the workings of a system. These measures focus on the components of systems associated with a particular negative outcome, as opposed to the incidence of these events.
- **Balancing measures:** These measures are used to ensure that any change does not create additional problems.

Examples of improvement methods

There are a number of examples of improvement methods in health care which are presented in a separate handout. The most popular and effective methods leading to significant improvements in health care are Clinical Practice Improvement (CPI) methodology, Root Cause Analysis (RCA) and Failure Modes and Effects Analysis (FMEA).

Strategies for sustaining improvements

Making the improvement is not the end of the process; the improvement needs to be sustained over time. This means continuous measuring and adjustment through PDSA cycles.

There is overwhelming evidence that patient care improves and errors are minimized when health-care professionals use quality improvement methods and tools. Only when these methods and tools are used, will the efforts of the team be rewarded by real, sustained improvements in health care.

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