Redesigning Hospital Care Program
An introduction to process redesign
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How will this guide help you?
This guide is one of a series of documents that the Redesigning Hospital Care Program has developed to assist health services with their redesign work. This guide focuses on:

- a brief introduction to redesign techniques and approaches
- a basic framework for the progression and realisation of redesign programs
- a measurement framework to track the progress and outcome of those programs, using a variety of data sources.

This guide is not a stand-alone document or a ‘how-to’ manual. It is designed to be used in the context of advice received from the health service’s redesign team.

Who will benefit from using this guide?
This guide is designed for use by multidisciplinary health service staff, who may or may not be new to process redesign, to improve the care and experience of patients.

What does this guide cover?
This guide focuses on:

- process redesign
- change management
- project management
- measurement for improvement.

Process redesign

What does this section cover?

- What is process redesign?
- What are the key principles of process redesign?
- What are the different redesign approaches?
  - Lean Thinking
  - Six Sigma
  - Lean Six Sigma
  - Theory of Constraints.
- What structured approach can be used to undertake redesign?
  - defining the scope of work
  - diagnose
  - intervene
  - evaluation
  - sustaining the improvement.
What is process redesign?

In general terms, process redesign is an approach to mapping, reviewing and redesigning the patient journey to meet demand and ensure that care is safe, effective and efficient.

Simplifying the journeys patients make through our healthcare institutions can:

- reduce errors
- improve patients’ access to services
- lower costs
- make better use of existing resources.

Process redesign may also be used to improve the secondary processes that impact on the patient journey, for example, processes that involve the movement of goods, equipment or objects. Services, such as pathology or pharmacy services, may involve all three of those elements.

What are the key principles of process redesign?

There are a number of key redesign principles that should guide all redesign programs:

1. **The centrality of the customer: adopting the patient’s eyview**
   Hospitals are complex places, with care being delivered by many different groups of people. Process redesign supports the adoption of a patient’s eye view by using a variety of techniques to ensure that the journeys patients make through health services are brought into view so that they can be understood and improved.

2. **Describe and redesign work processes**
   The aim of health care is to improve patients’ physical or mental well-being. The care that achieves this is delivered via a series of acts and actions. A Work Process is a term used to describe those acts and actions organised into operational sequences where value is created by improving physical or mental wellbeing.

   Process redesign concentrates on improving the sequences required by different groups of patients. Sometimes, it is possible to bring a number of sequences together into broader streams of work, and to then redesign those broader streams to make it easier to provide them with the high-quality care they require.

3. **Measure components of the process**
   This guide describes some general issues in measurement for improvement. Measurements relevant to specific areas, for example, Emergency Departments, are discussed in guides related to those areas.

4. **Recognise the expertise of the people who work on the front line**
   Hospitals are filled with staff dedicated to providing the best possible care; ignoring their expertise is wasteful and demoralising. Sustainable change is only possible when front line staff are full partners in the improvement program.
What are the different redesign approaches?

Understanding the characteristics of commonly used methodologies will help redesign teams select methods and tools appropriate to their needs. Specific methods commonly used include: Lean Thinking, Six Sigma, Lean Six Sigma, and the Theory of Constraints. The following table summarises the different approaches:

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The four approaches are summarised below:

**Lean Thinking**

Lean Thinking is primarily concerned with the creation of flow in processes, and the removal of wasteful activities that do not directly improve patient care and that waste the precious resource of staff time and capacity. This is achieved by determining what is of value to the customer. The objective of Lean Thinking is to provide the best quality care, in the shortest time, for the best use of resources. Lean Thinking is structured around five basic principles, which were first defined in the following terms:

1. define value from the perspective of the customer, in terms of a specific product
2. identify the entire value stream for each product, or product family
3. make the remaining value-adding activities flow by eliminating waste, and/or reorganising the process
4. let the customer pull the product through the process by designing and providing the product only when the customer wants it
5. pursue perfection, through continuous improvement.

**Six Sigma**

Six Sigma is a data-driven methodology that focuses on identifying and reducing variation in a process, thereby eliminating defects. A defect is defined as anything outside of customer specifications. Six Sigma teams follow the DMAIC model for process improvement. DMAIC stands for:

- define – identify an opportunity for improvement and document the process
- measure – undertake data collection and use diagnostic tools to understand baseline performance
- analyse – apply statistical tools to identify variation and the most important causes
- improve – develop and implement potential solutions, and measure changes in the process
- control – standardise the process and monitor performance.

**Lean Six Sigma**

Lean Six Sigma blends the approaches of Lean Thinking and Six Sigma. An integrated approach enables organisations to:
• maximise process effectiveness (minimise variation and reduce defects)
• maximise process efficiency (eliminate waste and improve flow)
• Lean Six Sigma teams select the implementation method (DMAIC or Kaizen Event) appropriate to their opportunity.

**Theory of Constraints**

The Theory of Constraints states that in any complex system there are only a few factors (constraints) that limit performance. For improvement to occur, these constraints must be identified and strengthened. A constraint may be related to people, policies or equipment. The Theory of Constraints is applied using the ‘five focusing steps’:

- identify the constraint
- exploit the constraint - focus on how to get more out of the constraint within the existing limitations
- subordinate everything else – modify the non-constraint areas to achieve maximum exploitation of the constraint
- elevate the constraint - increase the capacity of the constraint
- repeat – identify the next constraint.

**What structured approach can be used to undertake redesign?**

Principles and philosophies provide the foundation for effective process redesign. But these have to be turned into practice, and it is common experience that process redesign works best when the underlying methodologies are implemented via a structured program that moves through well-defined phases. The phases are:

- defining the scope of work
- diagnosing the issues
- developing appropriate interventions
- evaluating the outcomes
- sustaining the improvement.

**Defining the scope of work**

Developing a shared understanding as to where the journey to be redesigned begins and ends is a practical way to begin a program of process redesign. This understanding has to be shared between the redesign team, the relevant managers, and the key front line staff. Key questions to ask are:

- Is the focus of the Redesign program from the point of arrival of an ambulance through to discharge?
- Is it from arrival of a referral letter through to arrival at the operating theatre, or from the point at which a decision is made to admit a patient, through to arrival at a ward?

The specifics will be determined by the task at hand, and in collaboration with the stakeholders involved, but the scope of the program needs to be set out clearly and understood by all involved.

A shared understanding of the scope of a program of work ensures that the participants look forward to the work that needs to be done, not back into blame and negativity.
Diagnose

It is essential that teams develop a deep understanding of their own situation as a basis for improvement. Imported solutions may or may not be appropriate for your context, but starting with a pre-determined process solution, no matter how correct it may be, disempowers front line staff and increases the likelihood of a negative response; for example, ‘this is just another “good idea” from somewhere else. Let’s wait till it all passes over and then we can carry on doing what we have always done’.

The diagnostic process will usually involve some or all of the following elements:

- Bringing the people together who touch a process (including patients, whenever possible) to map out the process steps.
- Observing staff and patients to confirm how the work is actually done.
- Defining process sequences in more detailed flow charts, such as value stream maps.
- Using existing data sources, as well as direct observation, to provide a baseline to assess the impact of an improvement program.

Intervene

The plan-do-study-act approach is a useful basic improvement approach to trialing changes and comprises:

- **Plan** - diagnose the current situation carefully, base changes on a deep understanding of the way the work is done now.
- **Do** - act to increase the time staff spend on value-adding activity by making the work easier to do; improving co-ordination; improving communication; cutting out wasteful activities, and, by eliminating the opportunity for error.
- **Study** - evaluate the impact of the intervention.
- **Act** - use that evaluation to refine and further improve the intervention.

Process improvement deploys a range of non-health improvement methodologies. These include:

- value stream segmentation
- the analysis of capacity and demand to smooth demand variation
- 5S to improve workplace organisation
- The implementation of visual management systems.

But, at all points, an appropriate intervention must be identified and implemented by a multi-disciplinary front line team supported by the hospital's redesign team, and be undertaken in a spirit of learning.

Evaluation

As the redesign program progresses, formal decisions have to be made about whether to continue with the improved process. The benefits may seem self evident to the participants, but it is important to be able to objectively demonstrate that gains have been made.

There are three viewpoints that need to be taken into account:

- The patient viewpoint: has the safety, quality, acceptability and outcomes of care improved?
- The staff viewpoint: are care processes more acceptable for the staff, is staff time being used more efficiently and effectively?
- The organisational viewpoint: does the improvement program align with institutional priorities, and has progress been made on those priorities?

Sustaining the improvement

In many ways, sustainability is the greatest challenge for many improvement programs. Sustainable improvements come from carefully diagnosed and well-designed interventions that improve care for patients, and make providing that care easier for the staff involved. Sustainability is the end-product of good improvement design. One element that is often overlooked is the role of front line managers as improvement mentors. It is front line managers who have to turn new ways of working into everyday practices that can be supported, sustained, and supervised. Managers must be key members of the improvement team.
Change management

Well-designed visual management systems that help staff plan and schedule their own work, in conjunction with the other members of the team, sustain improvement programs more effectively than many other strategies. Making it visible makes it sustainable. Making it visible brings work under control. When there is a sense of stability, programs become sustainable because they improve care to patients and bring benefits to the staff on the ground. It is the involvement of the staff on the ground, solving of difficulties as they arise, that will ensure the program benefits are developed and sustained.

What does this section cover?

- Why is change management important?
- What change management theories are commonly used?
  - Prochaska and DiClemente
  - Kotter
  - Lewin
- How does change management align with the redesign process?

Why is change management important?

Change in organisations is never easy, and redesign teams need to respect the concerns of the staff they are working with but they also have to be prepared to lead where change is necessary and appropriate.

What change management theories are commonly used?

The importance of the human element in process redesign requires redesigners to be familiar with change management strategies that focus on staff’s readiness to change, as well as on more global strategies. There are numerous change management frameworks. Three commonly-used models are:

**Prochaska and DiClemente**

The stages of change model, associated with the work of Prochaska and DiClemente, describes how individuals and groups pass through several stages, or phases, in relation to change (adapted from Prochaska JO, Norcross JC, DiClemente CC, 1994, *Changing for good*, W. Morrow, New York).

- **Pre-contemplation** – change is not currently considered. Responses include clarifying the risks of continuing ‘as is’, and encouraging a re-evaluation of existing processes.
- **Contemplation** – there is an awareness that change may be necessary but no real commitment to action has been made and a degree of fence sitting is in evidence. Responses involve an evaluation of the pros and cons of redesigned processes using data and evidence from all sources, and promoting the benefits of positive outcomes. A well-conducted diagnostic phase helps groups move on from this stage.
- **Preparation** – there is now some experience with the changed behaviours and processes but no final commitment has been made and the waters are still being tested. A strong diagnostic phase provides tools for monitoring and feedback of early results from redesign interventions. Those results can be used to encourage the move from preparation to action.
- **Action** – now processes are actually changing. Time and energy is committed to the necessary actions, behaviours are modified. Process redesign in action.
- **Maintenance** – the ongoing commitment to maintaining the redesigned processes. Formal evaluation and ongoing participation by line managers and senior staff is vital to ensure new processes are maintained.
Kotter


They are:

- **Building a sense of urgency** – why change if there is no problem? An alternate way of looking at this is to focus process redesign on the areas where there is already a burning deck that motivates change – we just cannot go on like this.

- **Building a guiding team** – Process redesign requires clear authorisation, redesign capacity, and engagement from the key stakeholders amongst front-line staff.

- **Getting the vision right** – a clear definition of the scope of a program of work and seeing from the patients’ point of view will help to ensure that everyone sees the importance of the redesign process.

- **Communicate to ensure participation** – but communication is more than simply informing or ‘consulting’ on decisions that have already been made; it is a genuine dialogue.

- **Empowering action** – the process redesign methodology described above is in itself an empowerment process.

- **Creating short-term wins** – when possible, getting some early benefits increases confidence that change is possible.

- **Constancy of purpose** – hard to achieve in the ever-shifting world of health care but sheer persistence is amongst the most powerful of all change strategies.

- **Embed/sustain change**.

Rogers

Rogers has a useful way of looking at the characteristic approaches of team members to change. He describes team member’s ‘appetite for change’ as being along a continuum, and suggests that change occurs as a process of diffusion over time. There is a need to identify ‘innovators’ and ‘early adopters’ as these team members will make implementing process redesign easier.

How does change management align with the redesign process?

Earlier on, the redesign process was broken into a series of stages: scope, diagnose, intervene, evaluate and sustain. Those stages can be used to highlight major issues in change management.

- **Scope** – helps to identify the readiness for change amongst the key stakeholders and identify if there is a sense of urgency around the issues.

- **Diagnostic phase** – the information generated will help move participants from contemplation to action. Generating the resources, permissions and authorisations necessary to gain a deep understanding of work processes will only be possible with a guiding team in place.

- **Intervention** – the emphasis on participation and engagement in the movement from diagnosis to intervention will empower action and help identify short-term wins.

- **Evaluate and sustain** – a commitment to evaluation will help reassure those who are wary of moving from contemplation to action, and will bolster confidence in the change.

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*Adapted from Rogers EM: Lessons for guidelines from the diffusion of innovation. It Comm | Qual Improv 21:324-328.1995

Source: Weber V, Joshi MS, 2000
Project management

Why is effective project management important?

There are many project management methods that combine a framework with a set of project tools and guidelines. The method chosen generally depends on the size, risk level and complexity of the project.

Project management should not be confused with the key steps to redesign outlined in the previous section of the toolkit. Rather, project management is a series of structured activities that, if implemented well, increase the likelihood of achieving a successful project outcome.

Process redesign will often engage large numbers of people over extended periods and, therefore, good project management is respectful of the time and energy of the participants.

What are effective project management principles?

Process redesign is a learning process. The starting points are a problem and a journey, not a solution. It is only when a whole working group deeply understands how the work is done currently, that the group can then apply itself to identifying possible solutions and testing them out.

However, good ideas are only a part of the challenge. Good ideas have to be made to work, and good ideas require good project management to make them work on the ground.

No matter what is being implemented, project managers have to make sure the basic steps in project management are followed through. Good project management involves asking the right questions and using the answers to structure a project plan.

These questions include:

- **Planning** – is there a project plan, with realistic timelines, and clear accountabilities for who will do what? If something is everyone’s responsibility, there is a danger that it will be no one’s responsibility. And if costs are involved, a budget needs to be developed and appropriate authorisations obtained. Who is developing the budget and making sure the funds are available?
- **Organising** – Has enough of a project timeline been developed to ensure that the key physical and human resources required will be available when they are likely to be required? Who is responsible for purchasing the goods and services that will be required? Have human resource issues been worked through?
- **Implementing** – great plans are meaningless unless they are implemented with care and attention. Has an implementation plan been developed? Is it clear who is responsible for implementing what? Are stakeholder expectations being met by the implementation?
- **Monitoring** – There is always a gap between theory and practice. What is the plan for monitoring the implementation and for problem solving as issues arise? This is particularly important in the early period of project implementation. What is the monitoring cycle – every hour, every day, every week? Does the monitoring cycle do justice to the complexity and difficulty of the project? Have sufficient resources been allocated for monitoring and problem solving?
- **Project completion** – Is the problem long term, but the project short term? If so, planning for project closure must begin from day one. Is an evaluation planned or required? Is the evaluation formal or informal? Has the project sponsor specified elements of the evaluation in advance, and are the necessary measurement processes in place? How are you going to deal with stakeholder expectations? What will the project leave behind?
An introduction to process redesign

Those are general project management issues. In relation to projects that flow from process redesign, the following key issues need to be considered:

- The project management issues start with working with key stakeholders and the authorising managers to confirm the scope of the program of work.
- If this is an important piece of work, a program oversight or governance group needs to be created.
- If the next step is a mapping session or a tracking, there will be a whole set of logistics to setting the diagnostic work in motion and supporting it.
- Indicators need to be identified and baseline measures obtained.
- Times need to be identified for meetings of all kinds; the times must fit the needs of the largest number of staff members.
- In an ongoing way, resources need to be organised, working groups established and facilitated, communications maintained. Data needs to be gathered, analysed and fed back, and so on.

Process redesign needs well-organised project management and that needs to be resourced in its own right. But the project manager also needs to bring a knowledge resource into the program. Often it will be up to the redesign project manager to stop participants rushing to a solution, and keep them working in a systematic manner, having confidence that the program structure will get the project to the right place at the right time.

Measurement for improvement

What does this section cover?
- Why is measurement important?
- What are qualitative and quantitative measures?
  - qualitative
  - quantitative
- parametric measures
- non-parametric measures.
- What are the different types of measures?
  - measuring against an external standard
  - controlled or group comparisons
  - progress over time.

Why is measurement important?

Measurement is a vital part of any scientific enterprise, providing an external and objective template to assess the impact of process improvement. Measurement issues need to be thought about at the beginning of a process improvement program, not when the program is running or complete.

Earlier on, it was indicated that an improvement program needs to be aware of three viewpoints:

- the patient
- the staff that deliver care
- the organisation.

It is not the role of process redesign improvement programs to ‘privilege’ any one viewpoint, nor is it appropriate. Delivering the right care, at the right time, in the right place, that is right first time, is the optimal way of responding to each viewpoint. But ensuring that a process improvement program meets multiple goals requires a well thought through, and appropriately implemented, program of measurements.

The diversity of stakeholders in a process improvement program means that measurement for improvement requires the disposition of the whole range of
measurement techniques available to health care practice – measures that are qualitative or quantitative, parametric or non-parametric.

What are qualitative and quantitative measures?

**Qualitative**
Qualitative measures concentrate on using words and images to portray the essential characteristics of the subject at hand. Qualitative measures are often the best way of getting at what is felt to be really important in the experiences of the users of healthcare services.

The classic example of a qualitative measure in improvement work is patient stories captured in words or short videos. Patient stories provide powerful insights into the experience of care. They help staff of all kinds see through the patients eyes. They are great motivators. Given that improvement programs need to focus on both the patient outcomes and the staff outcomes, staff stories are also important to collect and understand.

**Quantitative**
Quantitative measures are measures that can be expressed in terms of definite numbers or amounts. In relation to measurement for improvement, parametric quantitative measures need to be distinguished from non-parametric, but quantitative, measure.

**Parametric measures**
Parametric measures are measures of entities whose exact values can be identified and defined by reference to some external standard, for example, length of stay is an exact measure which is said to be ‘parametric’ because, a length of stay of two days is exactly double a length of stay of one day, because a day is defined externally (eventually by reference to an atomic clock). Two 24-hour periods are not ‘a bit longer’ than one 24-hour period; they are exactly double. Exact measures of this kind can be subject to a variety of powerful statistical techniques.

**Non-parametric measures**
Non-parametric measures are important measurements for improvement. Non-parametric measures can be put into ranks but, unlike parametric measures, cannot be added or subtracted, multiplied or divided.

The simplest example of non-parametric and parametric measures are sports results. In the 100 metres dash, Brown, came first, Jones second, Smith third. Adding together second and third place does not make a value that outranks first, or that is lower than fourth. Ranks are fixed and not open to simple mathematical manipulation. But the time taken for each runner to complete the course is parametric – Brown took 9.8 seconds, Jones 9.9 seconds and Smith 10.01. The time difference between second and third (10.01-9.9=0.2 seconds) is twice as large as between second and first (9.9-9.8=0.1 seconds).

The most common non-parametric measures used for improvement are of staff or patient attitudes. Surveys may be undertaken before a program begins and then repeated afterwards. The responses fall into groups that can be put in order, but where the differences are not exact.

‘Strongly approve’, ‘approve’, ‘neither approve nor disapprove’, ‘disapprove’, ‘strongly disapprove’ are genuinely different categories. But what is the product of four units of ‘approval’ minus two units of ‘disapproval’. And are my units of ‘approval’ exactly the same size as your units of ‘approval’. Trying to count like that does not make sense; agreements don’t come in units that add, subtract, or can be multiplied.

In measuring for improvement, we commonly want to put things in rank order, accepting that differences between ranks may be somewhat approximate. In which case, very simple mathematical approaches work best, for example, 10 per cent of people think nothing has changed, 20 per cent think things have got worse, but 70 per cent think things have improved or improved greatly.
Computers or paper and pencil

The gap between simple analyses using paper and pencil and a calculator, and analyses that require a computer, is a very large one. Unless the process redesign team has good access to a biostatistician or equivalent, most useful measures for improvement can be worked out by hand or with a calculator.

Computers work best when testing whether relatively small differences are real or just the result of chance; when trying to understand how the components of a program interact with one another; and, with pre-existing characteristics of the patients whose care is being improved. The analyses involved are not simple to undertake because routine data produced by health services have many subtle characteristics that make analyses difficult to get right.

If the overall impact of a process redesign is not clear, then there is little point in using complex statistical techniques to dredge something up. It is only too easy to use powerful computer programs to produce results that do not actually mean anything. Simple is always best in this field.

What are the different types of measures?

Whatever the measurement strategies used, the chosen measures themselves will fall into one of three types.

Measuring against an external standard

Technically, measuring against an external standard is often the easiest kind of measurement to do. The fact that an external standard exists tells you what units to measure in (for instance, the percentage of patients having their operations within a defined time period) and how close or far away you are from success. Measurement occasions should be specified, not random, and occasions for measurement should be thought through in advance. Measurement occasions can be before and after an improvement program, or just at a point in time after the process redesign is complete.

Adherence to, or achievement of, an external standard can also be incorporated into monitoring and measuring over time, as described below.

Controlled or group comparisons

The double-blind, placebo-controlled, random allocation clinical trial is the gold standard of evidence-based medicine. It is not a standard that is easily adapted for programs of process redesign.

Process improvements have to involve the staff that provide care in devising and implementing improvements – staff in both the ‘trial’ or ‘business as usual’ comparison groups cannot be oblivious to what is being undertaken, so that basic criteria for randomisation and blinding cannot be met. Also, the double-blind, placebo-controlled, randomised clinical trial assumes that there is no diffusion of the thing being tested from the study group to the comparison group; this is hardly possible within hospitals where staff talk to each other, and are keen to introduce changes that improve care for their patients and make their work easier and more fulfilling to undertake.

So group comparisons are harder to perform in process improvement programs than might at first be assumed and the outcomes are harder to interpret than those from a conventional clinical trial of a new drug or procedure. Is like really being compared with like in relation to the patients involved? Was there little or no contact between
the staff undertaking the process improvement and the staff continuing with the pre-existing methods of care? If these conditions are not met, group comparisons may not be valid.

Progress over time
In many ways, the most satisfactory approach to measuring the introduction and outcomes of programs of process redesign is to:

- define key measure of improvement that answer the question ‘how will we know that we have really made a difference?’
- undertake baseline measurements before the introduction of the improvement program
- keep recording the measures as the process redesign program is introduced and undertaken
- note the timing of any intervention
- then examine the record of measurement to see if a measured change coincides with the introduction of a change in process.

If an external standard has to be reached, that can be incorporated into the measurement program. But the most important aspect of measurement over time is to use a service or institution’s own performance as the baseline against which to assess improvement. That way, the danger of saying ‘well, we have reached a minimal acceptable standard for X so we can ease up now’ can be avoided.

The most common way to monitor and track the progress of improvement programs is to use a run chart; a measurement method commonly used by manufacturing and service industries. A run chart takes whatever measure is being recorded and charts its value at predetermined time intervals (every hour, every day, every week and so on) then joins the values together to provide a visual measure of change over time.

Which measurement focus should be selected?
A common and important question asked of process improvement programs is ‘do they work?’. This is not necessarily an easy question to answer, and ‘work for whom’ may be a more appropriate starting point. It is an issue that needs careful thinking through.

Process redesign programs may be focused on:
- releasing time and resources
- increasing adherence to standards
- improving access
- improving care outcomes
- or combinations of some or all of the above.

Releasing time
A program of process redesign can legitimately focus on reducing the time staff spend on non-value adding activities such as looking for things, looking for people, going over tasks time and again because of interruptions, and so on. How the released time is spent is for the staff and their managers to decide.

Unless the uses of released time have been specified in advance, the appropriate measures are simply the amount of time released by improved processes (often determined by a before-and-after tracking exercise), and changes to levels of staff satisfaction.
An introduction to process redesign

Similarly, a program of work may be focused on releasing the patients’ time by minimising waits spent in an outpatient clinic or by ensuring that patients leave hospital earlier in the day, or after a shorter total period of time. For the individual patient, the qualitative measures will be satisfaction; the quantitative measure will be the reduction in waiting time, length of stay and so on.

Redirecting released time

It may be decided in advance that released time will be redirected to specified tasks or priorities. Improving the work organisation of the nursing day may release nursing time and it may be decided in advance that some of that time should be redirected to activities designed to reduce the incidence of pressure ulcers. Standards for such activities may be in place and increased adherence to those standards is an appropriate measure for the improvement program, as well as the outcomes in terms of changes in pressure ulcer rates.

Evidence of increased time spent on approved activities without evidence of improved outcomes (for example, more time spent on pressure ulcer prevention but no change in the incidence of pressure ulcers) should lead to a closer scrutiny of programs to which the released time is being directed. Is the time actually being spent? Are the designated activities actually effective?

Assuming that released time will automatically improve outcomes that have not been specified in advance does not make analytic sense.

Increasing utilisation

Process redesign can focus on reducing the time spent on an activity sequence by reducing wasteful steps or other flow improvement strategies. The intent may be to increase the number of patients that can complete the required process in a given period of time. For instance:

- Improving the scheduling of X-rays can decrease set-up times and increase the number of patients who can be X-rayed in a day or over a week.

- Starting clinics on time and making sure that everything needed during a consultation is ready to hand can decrease the time taken to see individual patients and increase the number of patients seen during a clinic.

Process and outcome measures

Many evidence-based treatments have benefits that are only apparent over time. The improved patient outcomes resulting from evidence-based treatments for heart disease may not show themselves until well after patients have left hospital. In which case, measuring the percentage of patients who leave hospital with evidence-based treatments is called a process measure; it is assumed that adherence to correct evidence-based processes will enhance patient outcomes in the long term.

Improved adherence to the specific regimes in evidence-based treatment protocols can be a focus of process redesign programs but, as an area, it is more commonly the focus of clinical improvement programs than generic process redesign programs.

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Glossary of terms

**Controlled or group comparisons**
The double-blind, placebo-controlled, random allocation clinical trial is the gold standard of evidence-based medicine.

**Lean Thinking**
Lean Thinking is primarily concerned with the creation of flow in processes and the removal of wasteful activities that do not directly improve patient care.

**Lean Six Sigma**
Lean Six Sigma blends the approaches of Lean Thinking and Six Sigma.

**Measurement**
Measurement is a vital part of any scientific enterprise, as it provides an external and objective template against which to assess the impact of process improvement.

**Non-parametric measures**
Non-parametric measures can be put into ranks but, unlike parametric measures, cannot be added or subtracted, multiplied or divided. The most common non-parametric measures used to measure improvement are of staff or patient attitudes.

**Parametric measures**
Parametric measures are measures of entities whose exact values can be identified and defined by reference to some external standard.

**Process redesign**
In general terms, process redesign is an approach to mapping, reviewing and redesigning the patient journey to meet demand and ensure that care is safe, effective and efficient.

**Qualitative measures**
Qualitative measures concentrate on using words and images to portray the essential characteristics of the subject at hand.

**Quantitative**
Quantitative measures are measures that can be expressed in terms of definite numbers or amounts.

**Six Sigma**
Six Sigma is a data-driven methodology that focuses on identifying and reducing variation in a process, thereby eliminating defects. A defect is defined as anything outside of customer specifications.

**Theory of Constraints**
The Theory of Constraints states that in any complex system there are only a few factors (constraints) that limit performance and for improvement to occur, these constraints must be identified and strengthened.

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