QPS DNE
Regional Quality & Patient Safety
Dublin North East

National
Quality Improvement
Programme

Model for Improvement
(including Driver Diagrams and PDSA Cycles)

Guidance note on key concepts

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The Model for Improvement

The Model for Improvement, developed by Associates in Process Improvement, is a simple yet powerful tool for accelerating improvement. The model is not meant to replace change models that organizations may already be using, but rather to accelerate improvement. This model has been used very successfully by hundreds of health care organizations in many countries to improve many different health care processes and outcomes.

The model has two parts:

- Three fundamental questions, which can be addressed in any order.
- The Plan-Do-Study-Act (PDSA) cycle to test changes in real work settings. The PDSA cycle guides the test of a change to determine if the change is an improvement.

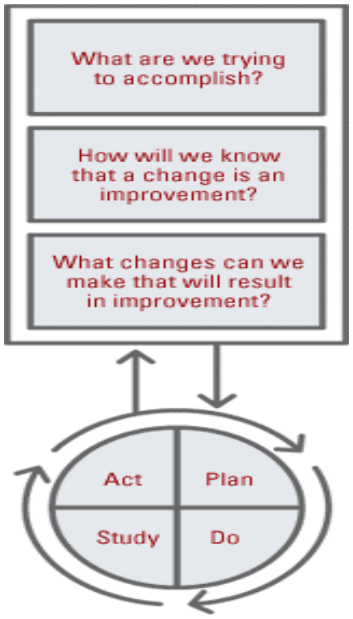


Figure 1. The Model for Improvement

Use of the Model requires a number of logical steps as follows;

1. Forming the Team

Including the right people on a process improvement team is critical to a successful improvement effort. Teams vary in size and composition. Each organization builds teams to suit its own needs.

2. **Setting Aims**

Improvement requires setting aims. The aim should be time-specific and measurable; it should also define the specific population of patients or other system that will be affected.

3. **Establishing Measures**

Teams use quantitative measures to determine if a specific change actually leads to an improvement.

4. **Selecting Changes**

Ideas for change may come from the insights of those who work in the system, from change concepts or other creative thinking techniques, or by borrowing from the experience of others who have successfully improved.

5. **Testing Changes**

The Plan-Do-Study-Act (PDSA) cycle is shorthand for testing a change in the real work setting — by planning it, trying it, observing the results, and acting on what is learned. This is the scientific method adapted for action-oriented learning.

6. **Implementing Changes**

After testing a change on a small scale, learning from each test, and refining the change through several PDSA cycles, the team may implement the change on a broader scale — for example, for an entire pilot population or on an entire unit.

7. **Spreading Changes**

After successful implementation of a change or package of changes for a pilot population or an entire unit, the team can spread the changes to other parts of the organization or in other organizations.

IHI Video – Model for Improvement

http://www.youtube.com/watch?v=SCYghxtioIY

http://www.youtube.com/watch?v=6MIUqdulNwQ

Driver Diagrams

Driver diagrams are a type of structured logic chart with three or more levels (see example below). These would include:

1. a goal or vision

2. the high-level factors that you need to influence in order to achieve this goal (called 'primary drivers')

3. specific projects and activities that would act upon these factors

For more complex goals the number of levels in a driver diagram can be expanded so that each primary driver has its own set of underpinning factors (i.e. 'secondary drivers' etc.). It is these secondary drivers (or lower level drivers) that would then be linked to projects and activities.

Driver diagrams provide a "theory of change". An example of a driver diagram for a simple goal is shown below in Figure 2.

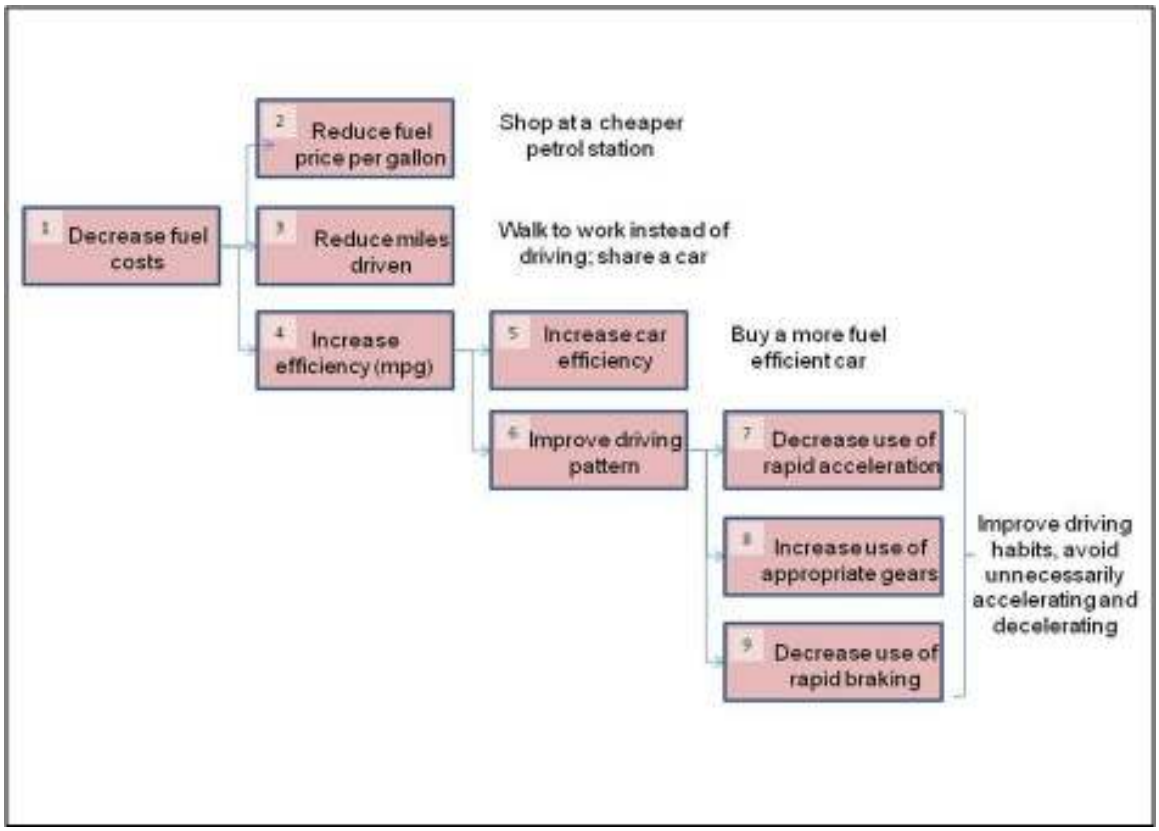


Figure 2. A generic Driver Diagram

This diagram shows how a basic goal to ‘decrease fuel costs’ can be achieved in three different ways. In some driver diagrams these ‘primary drivers’ would be things that have to occur together to achieve the goal. In other diagrams they may be listed as options for reaching the goal.

Notice that in this example, one of the primary drivers is broken down to two lower level ‘secondary’ drivers and that one of these is broken down into ‘tertiary’ drivers. At each level, the driver diagram ends with actions.

This driver diagram therefore shows a complete strategy for decreasing fuel costs. At a glance you can see what its creator decided were important factors and the actions that are planned.

Where possible, the drivers in a driver diagram should be made measurable. That way a driver diagram can become a measurement framework for tracking progress towards a goal.

When does it work best?

Driver diagrams can fulfil a range of functions. They can:

- help a team to explore the factors that they believe need to be addressed in order to achieve a specific overall goal
- show how the factors are connected
- act as a communication tool for explaining a change strategy
- provide the basis for a measurement framework

Driver diagrams are therefore best used when an improvement team needs to come together to determine the range of actions they have to undertake to achieve a goal. They are especially suited to complex goals like ‘reducing teenage pregnancy’ where it is important for a team to explore many factors and undertake multiple reinforcing actions.

How to use it

Figure 3 below shows the typical way in which a driver diagram is constructed by a group.

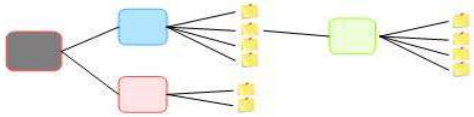
Gather together the subject matter experts	
Brainstorm "to achieve our goal, the things we need to improve are . . ."	
Cluster the ideas to see if groups represent a common driver	
Expand the groups (or single ideas) to see if new drivers come to mind	
Logically link together the groups into a driver diagram format	
(***Work backwards*** from project ideas if that helps!)	

Figure 3 – Outline of the process for developing a Driver Diagram

This process essentially represents a mixture of brainstorming improvement areas and then clustering them to create the drivers. It can be hard work for a team to create a driver diagram as implicit in the process are assumptions about the changes required to achieve a goal and the relative priority of these. However, sticking with this discussion and debate leads to better shared understanding of the task facing the group.

It is also important to remember that no driver diagram is objectively 'right'. They always represent a group (or individual) mental model of a situation – which might not be shared by others. The driver diagram is however a tool for communicating this mental model.

What next?

Driver diagrams fit into an improvement process. Before starting a driver diagram it is important to be clear about your goal (e.g. to 'reduce teenage pregnancy' rates or 'decrease fuel costs'). These goals are also termed 'aim statements'.

Once you have a completed driver diagram (including identifying your projects) you are ready to begin project implementation. Driver diagrams therefore naturally lead into activities such as developing project plans and undertaking PDSA cycles.

Where drivers are defined measurably and the driver diagram is used as a measurement framework for monitoring progress, time-series techniques such as statistical process control (SPC) can be applied.

Driver Diagram for *Pressure Ulcers to Zero*

As the Pressure Ulcer to Zero Collaborative is from it's inception working to a common aim and with a common change package (the SSKIN Bundle) the Driver Diagram for this Collaborative was developed as part of the collaborative pre-work. This Driver Diagram is outlined below;

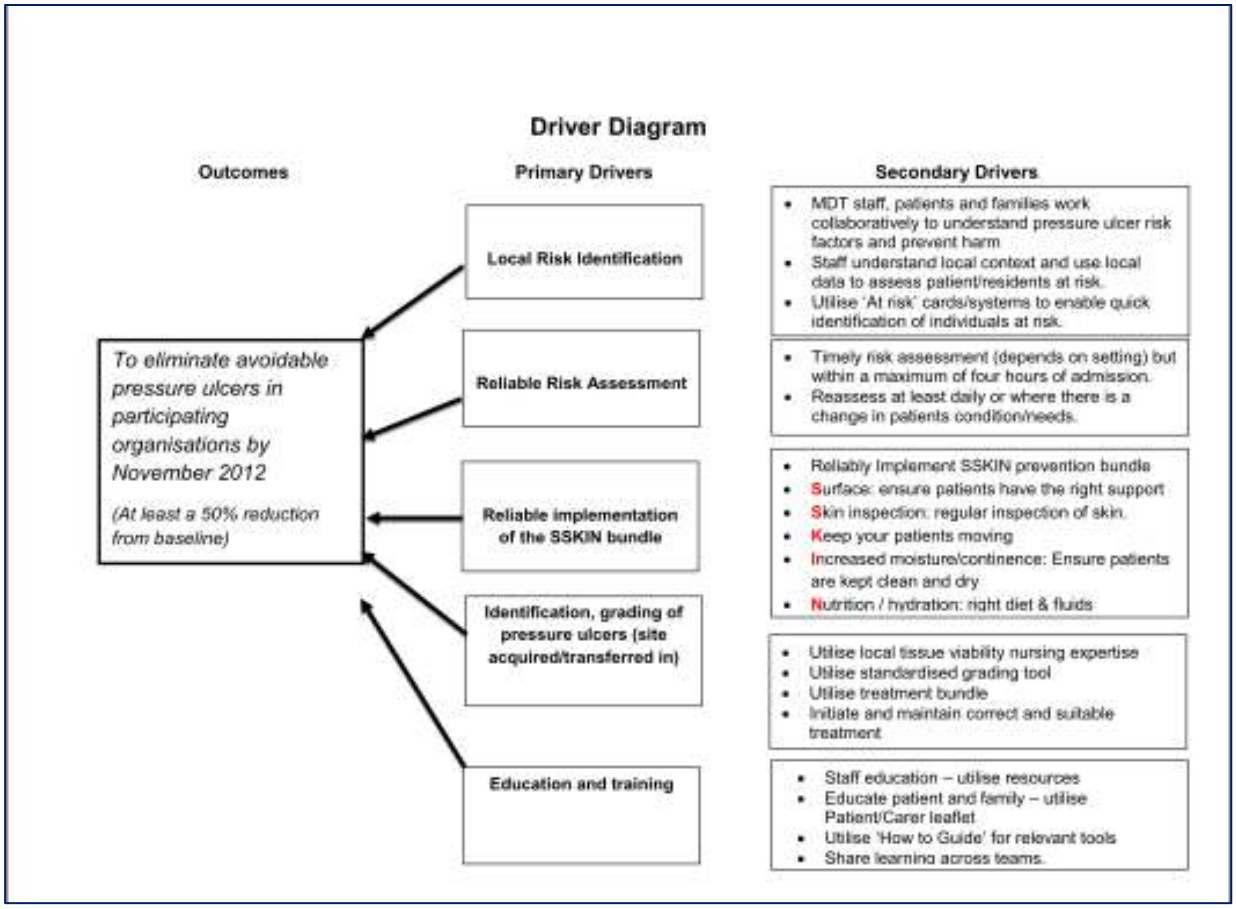


Figure 4. Driver Diagram - Pressure Ulcers to Zero

IHI Video - explaining Driver Diagrams

http://www.youtube.com/watch?v=A2491BJcyXA

Plan, Do, Study, Act (PDSA)

What is it and how can it help me?

You can use plan, do, study, act (PDSA) cycles to test an idea by temporarily trialling a change and assessing its impact. This approach is unusual in a healthcare setting because traditionally, new ideas are often introduced without sufficient testing.

The four stages of the PDSA cycle:

Plan - the change to be tested or implemented

Do - carry out the test or change

Study - data before and after the change and reflect on what was learned

Act - plan the next change cycle or full implementation

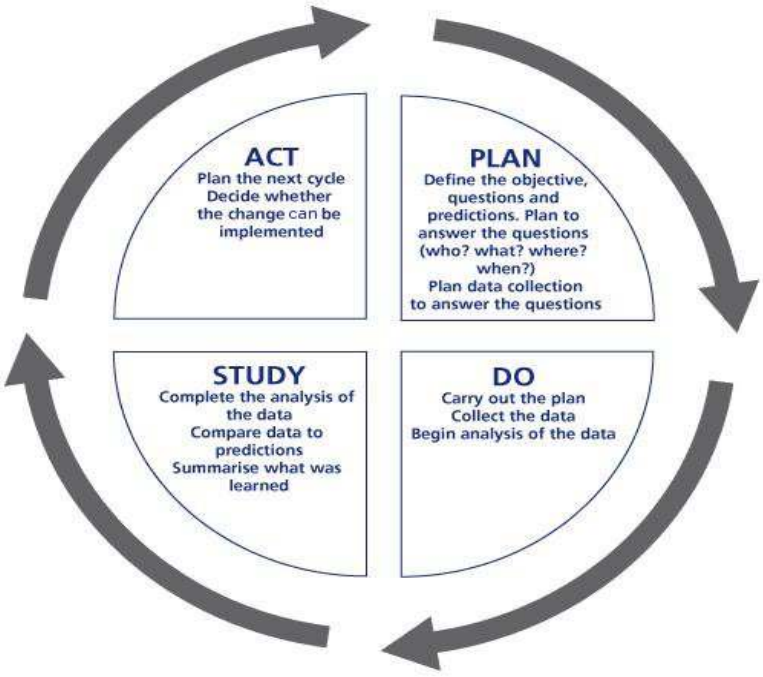


Figure 5. Steps in the PDSA Cycle

Step 1: Plan

Plan the test or observation, including a plan for collecting data.

- State the objective of the test.
- Make predictions about what will happen and why.
- Develop a plan to test the change. (Who? What? When? Where? What data need to be collected?)

Step 2: Do

Try out the test on a small scale.

- Carry out the test.
- Document problems and unexpected observations.
- Begin analysis of the data.

Step 3: Study

Set aside time to analyze the data and study the results.

- Complete the analysis of the data.
- Compare the data to your predictions.
- Summarize and reflect on what was learned.

Step 4: Act

Refine the change, based on what was learned from the test.

- Determine what modifications should be made.
- Prepare a plan for the next test.

Example of a Test of Change (Plan-Do-Study-Act Cycle)

Depending on their aim, teams choose promising changes and use Plan-Do-Study-Act (PDSA) cycles to test a change quickly on a small scale, see how it works, and refine the change as necessary before implementing it on a broader scale. The following example shows how a team started with a small-scale test.

Diabetes: Planned visits for blood sugar management.

- **Plan:** Ask one patient if he or she would like more information on how to manage his or her blood sugar.
- **Do:** Dr. J. asked his first patient with diabetes on Tuesday.
- **Study:** Patient was interested; Dr. J. was pleased at the positive response.
- **Act:** Dr. J. will continue with the next five patients and set up a planned visit for those who say yes.

After each PDSA cycle and considering the learning obtained, the process is refined, reapplied and monitored until the aim is achieved. This process is illustrated in Figure 6.

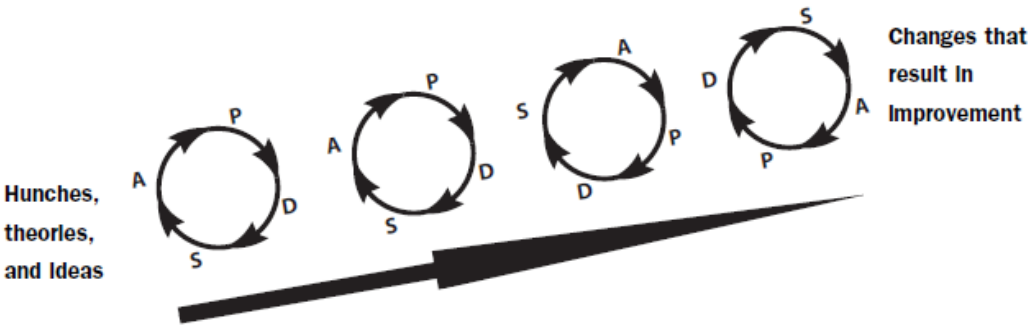


Figure 6. Multiple PDSA cycles leading to improvement

IHI Video – explaining PDSA Cycles

http://www.youtube.com/watch?v=xzAp6ZV5ml4

References and further Information

Institute for Health Care Improvement – resources
http://www.ihi.org/resources/Pages/default.aspx

NHS Institute for Innovation and Improvement – Quality and Service Improvement Tools
http://www.institute.nhs.uk/option,com_quality_and_service_improvement_tools/Itemid,5015.html

Easy Guide to Practice Improvement – NSW Health
http://www0.health.nsw.gov.au/pubs/2002/pdf/cpi_easyguide.pdf

Enhancing Project Spread and Sustainability – NSW Health
http://www.cec.health.nsw.gov.au/__documents/resources/tools-_and_-toolkits/spread-and-sustainability.pdf