

Research Article

A quality improvement tool - driver diagram: a model of driver diagram to reduce primary caesarean section rates

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ABSTRACT

Background: Quality improvement in health care is emerging as a science with proven, effective tools and methodologies. This article aims at presenting the importance of adopting one of the effective and simple methodologies and gives an example of a Driver Diagram in obstetrics.

Methods: Usefulness of driver diagram in understanding the aim and the interventions or changes.

Results: Various quality improvement tools can be used in the clinical context. Among them, driver diagram is most widely used at the start of an improvement initiative. The driver diagram in this article shows its applicability in one of the clinical aspects of obstetrics, to reduce primary caesarean section rates.

Conclusions: Driver diagram is an easy and a simple tool widely used in quality improvement activities. It is essential to use at the beginning of improvement initiatives.

Keywords: Quality improvement, Driver diagram, Quality improvement tools, Primary caesarean section, Labour dystocia

INTRODUCTION

Quality improvement is emerging as a science and has been used in the manufacturing and industries more extensively than in the healthcare field. Healthcare organizations both private and public sector are facing many new challenges and must continually improve their services to provide the highest quality of care at the lowest cost.

Quality improvement is a formal approach to the analysis of performance and systematic efforts to improve it. In health care, it consists of systematic and continuous actions that lead to measurable improvement in health care services and the health status of patients. Quality Improvement is a continuous and ongoing process. Improved quality leads to improved efficiency of the organization or hospital, better outcomes to the patients, increased levels of patient satisfaction and reduced costs.¹

Quality improvement may involve any area of activity in a healthcare setting. For ex: improved quality may mean reduced post-surgical infection rates, reduced wastage, reduced length of stay, reducing the number of drug adverse reactions or reducing harm to the patients, increased profits to the organization, improved patient satisfaction, increased belief and trust of patients in the system.²

METHODS

There are various frameworks for improvement. Six sigma DMAIC, model for improvement, lean model, FOCUS-PDCA, FADE etc.³ One of the most effective quality improvement framework for healthcare is model for improvement. This consists of asking three questions. What are we trying to accomplish? How will we know that a change is an improvement? What changes can we make that will result in improvement (Figure 1)?^{4,5}



Figure 1: Model for improvement.

This frame work includes two key concepts: small incremental tests of change and analyzing the results and acting on the learning before implementing by using Plan-Do-Study-Act (PDSA) cycles. The PDSA cycle means planning, doing or trying it, observing the results, and acting on what is learned. This cycle is one of the widely used quality improvement methodology in health care setting.¹

Many tools are used for quality improvement. They consists of tools such as driver diagram, flow chart, process mapping, cause effect analysis, tree diagram, scatter plots, pareto charts, control charts to name a few. All these tools are helpful depending on the context and area of improvement. In this article driver diagram is explained and its applicability with practical example in Obstetrics is provided.

Driver diagram

A Driver diagram provides a framework to help us clarify and articulate improvement goals. It is usually used at the beginning of an improvement activity in many fields, manufacturing, industries, hospitality and health care. (Figure 2). A driver diagram helps us complete the framework contained in the model for improvement. It allows us to link the first question - What are we trying to accomplish? And the third, what change(s) can we make that will result in improvement? A driver diagram is a tool for planning an improvement initiative, and helps to define which aspects of the system should be measured and monitored, to see if the changes/interventions are effective and if the underlying causal theories are correct. The information on proposed activities is organized in such a way that relationships between the aim of the improvement project and the changes to be tested and implemented is clearly displayed.⁶

It has three columns, aim/goal/objective; primary drivers, secondary drivers and change ideas may be added if necessary.

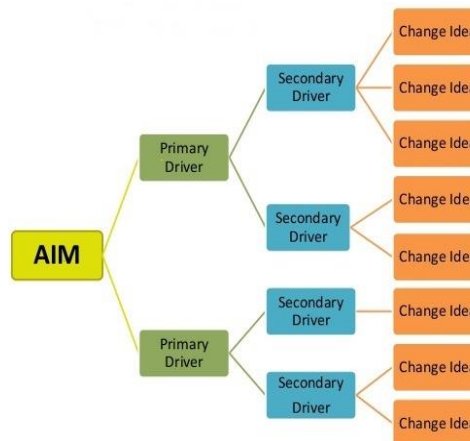


Figure 2: A model of driver diagram.

Aim or objective or goal

The aim should be specific, easy to measure, achievable and time bound. On to the right side of the aim, first column is primary drivers.

Primary drivers

Primary drivers are system components that contribute directly to achieve the aim. They help us to organize the work. In health care depending on the situation, they may be based on evidence based recommendations. They should be in the form of statements, may include terms such as improve/reduce, but not numerical goals.

Secondary drivers

These are usually elements within the related primary driver and consist of specific changes or interventions which will impact the primary drivers. A secondary driver can contribute to more than a primary driver.

Change ideas

These are actionable ideas for change. Help to accomplish the aim. These change ideas are initially tested on a small scale.

Steps in creating a driver diagram:

- 1) Start with a clearly defined aim.
- 2) Brainstorm potential drivers- area where change or intervention will have impact on the aim.
- 3) Cluster the ideas and form groups and see if groups represent a common driver.
- 4) Define each driver clearly as primary and secondary.
- 5) Expand the groups where possible to create a driver.
- 6) Logically link groups together into a driver diagram format.

After creating a driver diagram, it often helps to look at the driver diagram both forwards and backwards to make

sure that the drivers are properly aligned. Driver diagram is dynamic and it may need to be changed through the journey of improvement.

RESULTS

It is very useful to create a driver diagram at the beginning of an improvement activity. The example given emphasizes the ease of creating one and its applicability in one of the common problem areas of obstetrics that is how to reduce primary caesarean section rates.

DISCUSSION

A model of driver diagram to reduce primary caesarean section rate

Caesarean delivery rates are increasing throughout the world. A caesarean delivery can be life saving for the foetus, the mother or both in some cases; it is associated with long term maternal morbidity and mortality. Most women have normal conception, foetal growth, labour and birth and require minimal to no intervention in the process. Primary caesarean section rates vary widely and it is necessary to reduce unnecessary caesarean section rates in an organization. This reduction of caesarean section comes in the domain of quality improvement.¹¹ Many organizations have succeeded in reducing caesarean section rates by adopting model for improvement as quality improvement methodology.

Aim

Aim is to reduce caesarean section rates. The percentage reduction can be determined depending on the local rate and to be decided how much can be reduced in what time frame.

Primary drivers

In this example the primary drivers are based on common indications and these can be modified depending on the locally prevalent indications.¹⁰ Each primary driver is clearly defined. For instance, labour dystocia is one of the common indications for caesarean section. Evidence shows that unnecessary caesarean sections can be avoided by reducing interventions in the latent phase of labour. ACOG’s obstetric care consensus report states the active stage of labour to be considered from 6 cm of dilatation onwards.⁷⁻⁹ Many a times there exists controversy among obstetricians regarding the definition of arrest of descent and dilatation in the first stage and arrest in second stage of labour. It is prudent to reach a consensus regarding the definition based on evidence and formulate a guideline to reduce caesarean sections due to labour dystocia. Other primary drivers are incorporated in this example are based on common indications such as foetal distress, failed induction of labour.

Secondary drivers

Secondary drivers are components of primary driver and are derived after analysing the primary driver. For the first primary driver, the secondary drivers are, to identify active stage of labour and define arrest of dilatation and descent. For example, Caesarean section for labour dystocia can be reduced by defining arrest after 4 hours of no cervical change.¹²⁻¹⁵ A Partogram can be used to identify labour abnormalities. Similarly other secondary drivers for each primary driver are identified which are the areas of intervention or change. By modifying some of the processes of secondary drivers, it is possible to achieve the aim.

Change ideas

These are specific actions involved. For example, the staff needs to be trained in CTG, using Partograms, feed back to the staff (Figure 3).

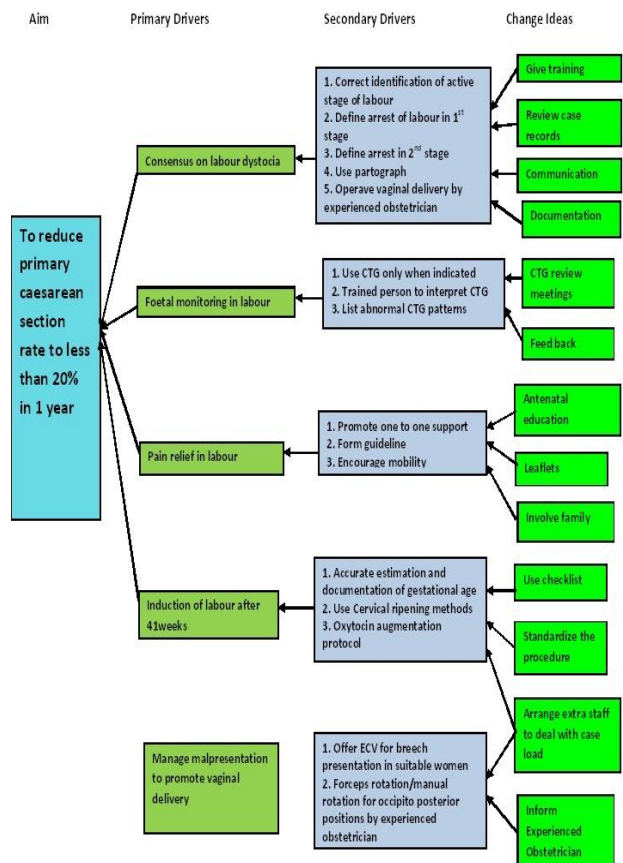


Figure 3: Driver diagram to reduce primary caesarean section rate.

Advantages of a driver diagram

- 1) It’s easy and simple to use. Clearly displays the areas where specific intervention is needed.
- 2) Helps us to stay focused and motivated to reach the aim.
- 3) Easy to communicate with others regarding the improvement

activities. 4) Could be reviewed again and again and modified depending on the circumstances. 5) Helps us to identify which processes to be measured. For example percentage of women who had Partogram completed, percentage of women for whom labour dystocia was correctly diagnosed etc.

Once specific areas are identified, the team/s should work together to achieve the aim. After completing the driver diagram the team should test changes initially on small scale using PDSA cycle and then implement the change if there is an improvement.

There may be many barriers for an improvement work. The Barriers for an improvement effort are cultural, attitude and behavior related. In general there may be resistance to change, to change the practice or process. These barriers can be overcome by good leadership, establishing effective team, involvement of all the members of the team, feedback and audit.

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