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Table of Contents

Introduction

Over the last decade, efforts to improve patient safety have escalated, acting as a powerful motivator for change in the structure and daily operations of hospitals. Improving safety, in particular, frequently necessitates increasing collaboration among healthcare professionals and shattering the conventional silos within which many established professions, such as risk management, have functioned for years. Risk management has developed to encompass proactive attempts to prevent patient harm, collaborative efforts to address system-based inadequacies that may lead to adverse events, and open communication with patients and families when things go wrong as those silos have been replaced by new models. Some hospitals also realize that providing patients with safe, high-quality care is critical to safeguarding the institution's financial assets, and so falls under risk management's purview. Risk management and patient safety specialists are involved in a close working relationship in this new environment, which can be characterized by easy integration, cautious cooperation, or disagreement.

PART A

What is the main literature gap behind the methodology of PDSA in the context of articles published in journals aiming to improve healthcare systems according the review paper?

The goal of the PDSA technique is to determine whether an intervention works in a specific situation as rapidly as feasible and to make adjustments as needed to increase the likelihood of achieving and maintaining the intended improvement. PDSAs, unlike controlled trials, allow for fresh learning to be included into the experimental process. If flaws with the initial plan are discovered, the theory can be amended to incorporate this knowledge, and a follow-up experiment undertaken to check if the problem has been solved, as well as to determine if any more issues need to be addressed. This flexibility and adaptability of PDSA are crucial traits that assist the adaptation of interventions to function in local settings in the complex social systems of healthcare. As PDSA was adapted from industrial settings to healthcare, an emphasis was placed on rapid small-scale tests of change, generally on one, three, and eventually five patients in 'ramps' of increasing scale, with responsibility assigned to frontline personnel and improvement or quality management. This pragmatic approach has been accepted, with healthcare professionals seeing it as giving them unprecedented freedom to lead change and improvement in local care settings. In healthcare, PDSA training frequently

emphasizes the framework's conceptual simplicity while overlooking the various ways in which the method can be adapted to handle increasingly complicated situations. This frequently leads to people jumping into PDSA without enough investigation and framing of the problem, delegating process management to frontline staff who have little influence over broader systemic concerns that need to be addressed, and providing little support to these staff to overcome the obstacles and barriers they face. The resources, skills, and knowledge required to execute PDSA in the real world are frequently undervalued, resulting in initiatives that are doomed from the start. This has given the idea that PDSA cycles are just 'quick and dirty' change tests. In the haste to empower healthcare workers, the scientific integrity of the PDSA method is routinely jeopardized. The main principles of PDSA are frequently not implemented in reality, according to a systematic review, with "considerable diversity in how they are developed, executed, and reported in the healthcare literature." Failure to effectively use PDSAs can sabotage learning efforts... 'The improvement activity is less likely to succeed if data gathering is not done frequently enough, iterative cycles are few, and system-level changes are not visible as a result of these cycles. This could be defined as the main gap. (Perry, Bell, Shaw, Fitzpatrick & Sampson, 2014)

Describe the four stages of PDSA in terms of their content, milestones and how each stage contributes to the overall improvement project.

PDSA, or Plan-Do-Study-Act, is a four-stage problem-solving technique that can be used to improve a process or implement change.

Internal and external customers should be included in the PDSA cycle since they can provide input on what works and what doesn't. Because the consumer defines quality, it makes logical to include them in the process as much as possible to boost acceptability of the final product. (If you're unsure who your customers are, you might want to make a customer chain to help you figure it out.)

Ask yourself three questions when using PDSA:

What are we attempting to achieve?

How will we know if a change is beneficial?

What changes can we make that will make a difference?

Plan

A. Form a team

Assemble a team of people who are familiar with the problem or improvement potential. Consider the abilities that each team member brings to the table; search for people that are active and forward-thinking. Identify roles and duties, define timelines, and organize a meeting schedule after recruiting team members.

B. Write a goal statement.

In an aim statement, explain what you wish to achieve. Answer the following three fundamental questions:

What are we attempting to achieve?

How will we know if a change is beneficial?

What changes can we make that will improve things?

C. Describe the existing situation and the brainstorming process.

Examine the way you're doing things now. Begin by posing the following questions to the group:

So, what are we going to do now?

How are we going to do it?

What are the main steps involved in the procedure?

Who is involved in this?

What exactly do they do?

What is well-executed?

What could be improved?

If you've completed a SWOT analysis, you may have already answered the last two questions.

See if you can find a map of swimming lanes. To graphically represent your method, you might find it beneficial to create a swim lane map. Creating a process flow or at the very least illustrating the present process can be extremely beneficial. If your team hits a snag, you might have figured out what's wrong—or the appropriate person to figure out what's missing isn't present.

Obtain more information

Following the completion of the general structure, the following are some further questions to consider:

What is the current time frame for the procedure? Each and every one of them?

Is there a difference in how the process is currently carried out?

D. Specify the issue

State your desired successes using the objective statement produced in Step B, then use data and information to measure how your company fulfils or fails to meet those accomplishments.

For example, if your goal is to improve your employees' quality of life at work, you might gather data by surveying them about workplace pressures.

Create an issue statement.

To properly explain your team's consensus on the problem, write a problem statement. If your team has identified more than one problem, you may find it beneficial to prioritize them and/or offer a reason for why you choose your concern (s).

E. Determine the sources of the problem and possible solutions.

Examine the sources of the problem.

Work to discover the sources of the problem in your problem statement using tools like control charts, fish bones, and work flow process maps (e.g., flowcharts, swim lane maps). The underlying causes should be described and justified at the end of the cause analysis to summarize the findings.

Examine your procedure and consider the following questions:

Is this procedure effective? How much will it cost (in terms of money, time, or other resources)?

Are we taking the proper measures in the correct order?

Is there anyone else who goes about this approach in a different way?

Consider other options.

By completing the statement, you can try to reduce your root causes.

"If we do_____ , we will get_____ ."

Choose one (or a few) options that you believe would best help you achieve your goal while maximizing your resources.

Create an action plan that includes the necessary personnel/resources as well as a timeline. As you carry out your action plan, try to account for any potential hazards.

DO

Begin putting your strategy into action. Collect data as you go to aid in the evaluation of your plan in Stage 3: Study. To collect data/occurrences as they happen or over time, your team could find it useful to utilize a check sheet, flowchart, swim lane map, or run chart.

Problems, unanticipated consequences, and general observations should all be documented by your staff.

STUDY

Consider the plan and the results.

If your team determined that the idea worked, standardize the enhancement and start using it on a regular basis. Return to Stage 1: Plan and re-examine the process after some time has passed to see where it may be improved.

Return to Stage 1: Plan and design a fresh and different plan that might result in success if your team believes an alternative approach will be more successful.

The PDSA cycle is continual, and as businesses intuitively implement PDSA into their planning, they grow more efficient.

Recognize accomplishments and lessons learnt.

Internal and external clients should be informed of your accomplishments.

Take actions to protect your gains and build on your achievements.

Make long-term strategies for future enhancements.

When necessary, perform iterative PDSA cycles. ("Plan-Do-Study-Act (PDSA) Directions and Examples", 2022)

3- **What deficiencies have been unravelled with respect to the use of PDSA?**

Its simplicity conceals its sophistication

One of the most common myths about the use of PDSA in healthcare is that it is simple and that anyone can use it. On one level, this is correct, and one of the PDSA method's key virtues is its simplicity and applicability to a wide range of scenarios. However, because of its simplicity, PDSA poses some of the most difficult obstacles to master. Users must be able to adjust their use of PDSA to different challenges and phases in the improvement project's lifetime. This necessitates a diverse set of skills and expertise, which must be combined with the core PDSA paradigm.

One of the most common misunderstandings about PDSA is that it may be utilized as a stand-alone method. PDSA should be utilized as part of a larger set of QI techniques, the nature of which may be modified by the overall methodological approach (eg, model for improvement, lean). Conducting studies prior to beginning the usage of PDSA to verify that the problem is accurately identified and defined is an important part of the broader methodological approach. Process mapping, failure mode impacts analysis, cause and effect analysis, stakeholder involvement and interviews, data analysis, and assessment of existing evidence are all examples of investigations.

The PDSA is also misunderstood as being limited to small-scale change studies on one, three, or five patients. PDSA is a highly adaptable strategy that can be used to support the scaling up of interventions as well as monitoring efforts to ensure long-term sustainability. However, this adaptability creates a number of important dimensions that must be carefully considered. The extent and magnitude of the change, the amount of preparation required prior to usage, the rigor of the evaluation, time, knowledge, management support, and financing, for example, must all be carefully coordinated. Throughout the project's existence, these requirements are frequently rebalanced. These adjustments, if correctly managed, allow PDSA to adapt to new learning and support the design and execution of 'change tests' as they grow in scale and complexity to meet the intended improvement goal.

As a result, using PDSA as an iterative design framework to help address "large hairy problems" or "big hairy audacious objectives" is perfectly acceptable. Indeed, discovering solutions to large-scale 'wicked issues' may necessitate a PDSA-style 'iterative explorative and

generative' approach, in which 'knowledge is built through design.' The key is to realize that for huge and complicated problems, this framework will need to be implemented (and resourced) significantly differently than for smaller and more 'tame' situations. There is no such thing as a one-size-fits-all solution.

While frontline workers with limited training or support may be able to solve some quality issues, the complexity of many issues necessitates more organizational support, including direct involvement of senior management to facilitate sufficient planning. Projects in which frontline employees are left to their own devices risk a lack of use of theory and existing evidence in the development of the intervention, as well as a suboptimal evaluation. (Taylor et al., 2022)

Inability to devote resources to a thorough and targeted application

The PDSA approach is conceptually straightforward, but it does not imply that it is simple to implement. PDSA, on the other hand, is a powerful method, and programs that apply it well can solve specific quality issues while also helping to improve the culture of healthcare organizations. As a result, the time and effort required to correctly utilize PDSA pays off handsomely. However, the resources and supportive environment essential for success (including financing, methodological competence, buy-in, and long-term effort) are frequently overlooked. Many projects fail due to a lack of human resources and financial backing, which also undermines organizational culture, adding to change fatigue and disappointment as yet another project fails to deliver tangible results. It is therefore critical that the resource needs for successful implementation of PDSA for a given project are well known and that the process is adequately managed, both at the project and programmatic levels. In a healthcare culture of 'just get on with it' and 'do, do, do,' the challenges to assuring this type of practice are difficult to overcome. To be effective, PDSA must be accompanied by a large investment in leadership, experience, and change resources. Academia and academics have a possible role to play in promoting adequate planning and study, as well as understanding how to manage emergent learning while involving a variety of stakeholders. Collaboration will be helpful to the effective implementation of PDSA and is necessary for the establishment of true learning organizations.

PART B

1. Propose a PDCA improvement project to address a healthcare problem of your choice. Ensure to describe in detail the problem you wish to address and analyse its possible causes using the Fishbone Diagram tool and Pareto chart. Identify the vita few causes (2) and address them with a suitable solution.

To change a system's quality of care outcome, quality improvement programs must first identify the factors that influence the outcome. Changes can be done to address the reasons of a given outcome and change the outcome once the causes have been identified. This assignment in this Moving Points feature on quality improvement will use the example of home dialysis (home haemodialysis and peritoneal dialysis) to provide health care professionals with the tools they need to analyse the steps that contribute to certain outcomes in health care quality and develop ideas that will eventually lead to their resolution. Cause and effect diagrams, Pareto analysis, and process mapping will be discussed as tools for identifying the primary contributors to a quality of care outcome. We'll also go over some typical change concepts and do some brainstorming to come up with some good change ideas.

Root cause analysis was first used in systems engineering to determine "the underlying and causative factor(s) that underpin performance variance." It is currently a well-known tool for hospitals and health-care organizations to discover problems and solutions. Root cause analysis has traditionally been employed in the health-care environment to analyse the causes of medical errors, but it has lately been utilized to remedy shortcomings in care quality and enhance quality outcomes. As a result, it is a necessary tool for quality improvement. Although there are alternative techniques to understanding problems inside a system, such as Six Sigma and Lean , root cause analysis is the most straightforward and straightforward, and it is the most often used method for detecting quality issues. Most outcomes in any given system are the result of a complicated chain of behaviours and events that take place within that system. As a result, determining why a specific outcome happens necessitates a structured method that can identify active (events occurring at the point of interaction between people and a complex system) and latent (issues buried within a system) events that contribute to the result. Such an approach can be found in root cause analysis. It's a method for determining the true reasons of a specific outcome that employs a structured exploratory strategy. The concept of root cause analysis, as it relates to quality improvement efforts, is based on the premise that the solution to a particular outcome can be discovered by looking at the basic variables that may be causing that event. In the context of quality improvement, the goals of a root cause analysis are to determine what is

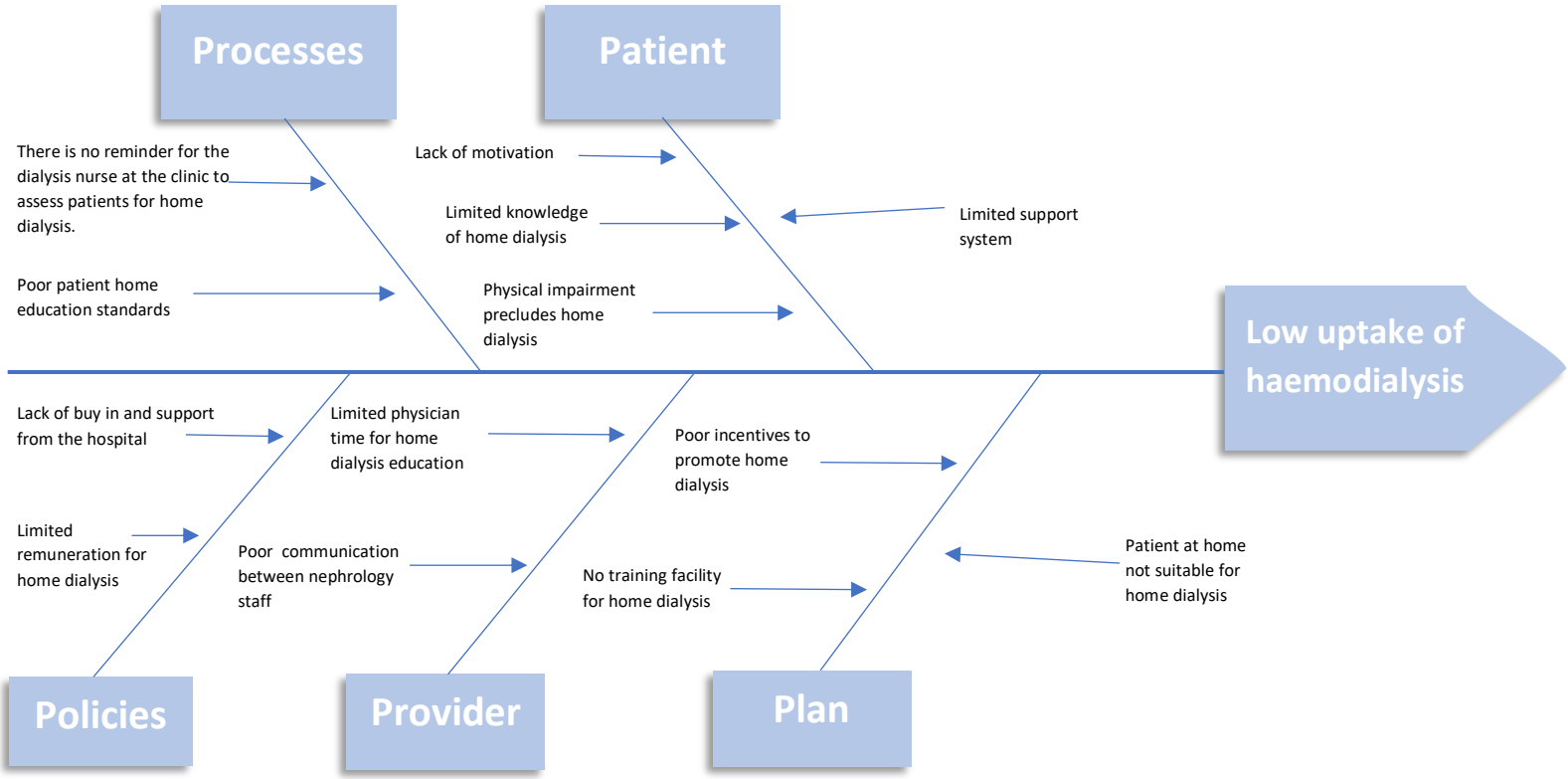
happening, determine why the outcome is occurring, and determine what can be done to avoid the outcome from occurring again. In our example, root cause analysis will assist the quality improvement team in determining why the dialysis program is not meeting its goal of 30 percent of patients commencing home dialysis and facilitating potential change options.

There are a variety of methods available to assist pinpoint the source of quality issues and focus improvement efforts. Although each tool has a distinct purpose and so provides unique insights into a quality-of-care issue, they are complementary to one another and are frequently used in tandem. This is especially true for fishbone and process maps, which are generally often done at the same time. It's crucial to remember that the effectiveness of root cause analysis techniques is influenced by the opinions and experiences of the people who use them. To avoid inaccuracies and omissions, it is critical to include key stakeholders and frontline staff. ("PDCA Cycle and Its Application in Healthcare Industry |QM", 2022)

Ishikawa or Fishbone Diagram (Cause and Effect Diagram)

When a team wants to identify the various potential causes of a quality-of-care problem and focus improvement efforts on these reasons, they utilize the Ishikawa or fishbone diagram. It can be applied at several stages of the quality improvement process, although it is most commonly employed in root cause analysis. The fishbone diagram resembles a fish's skeleton. The problem (effect) is written in a box on the far right of the diagram to produce this diagram for a quality of care concern. To the left of the box where the problem is recorded, a central line (spine) is drawn. After that, diagonal lines (fish bones) are drawn off the central line (spine). These diagonal lines reflect several groupings of the problem's causes. To show causes of causes, additional lines might be created off the main fish bones. The five Ps (patients/clients, providers, policies, processes and procedures, and place/equipment), the six Ms (machine, method, materials, measurement, man, and Mother Nature), and the four Ss (surroundings, suppliers, systems, and skills) are common groupings; however, the groupings should be specific to the organization and problem under study, and the quality improvement team is in charge of ensuring this specificity. Following the specification of the categories, the quality improvement team holds a brainstorming session to identify causes particular to each category. This technique is repeated until the team is unable to find any other causes. Using the diagram, it is clear that a number of factors may be contributing to the low proportion of patients who begin dialysis at home. It's vital to note that each probable reason in the fishbone

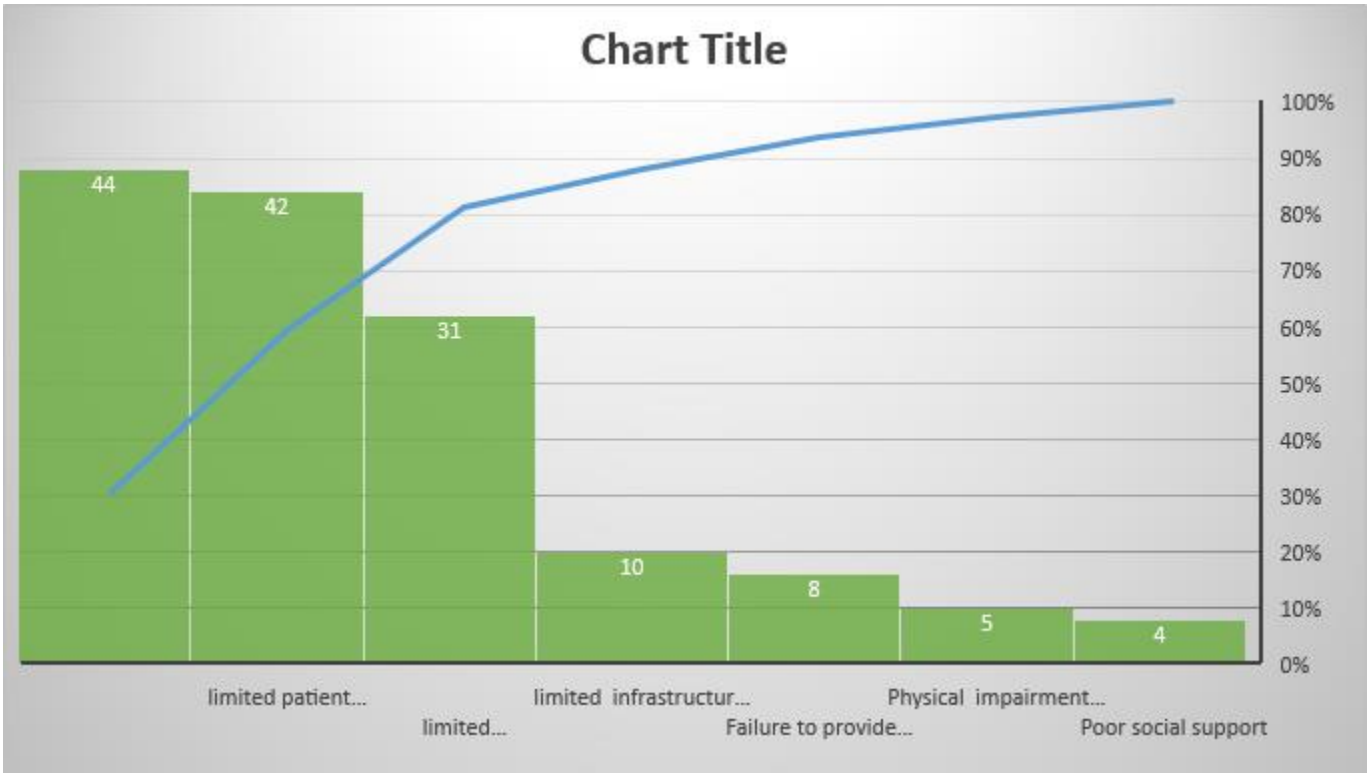
diagram is equally weighted, and pinpointing the underlying cause of the quality outcome necessitates the use of additional tools as well as extra team discussion. (2022)



Pareto Analyses (Pareto Principle; 80/20 Rule)

A team may quickly identify which processes have the most impact on a quality of care outcome by using Pareto analysis to categorize data. This approach is based on the hypothesis that a limited number of processes contribute the most to poor quality. As a result, it adheres to the 80/20 rule, or Pareto principle, which claims that 80% of a system's effects/outcomes are tied to 20% of the causes. When there appear to be numerous processes contributing to an outcome, Pareto analysis is especially useful since it allows you to focus your efforts on the ones that will have the largest positive impact. The drawing of an Ishikawa diagram to determine the potential causes/processes leading to a certain quality outcome is the first step in performing a Pareto analysis. After that, a check sheet is created. A check sheet is a pre-made, structured form for gathering and analysing information. It's employed when data can be watched and collected regularly using a variety of methods, such as clinic audits, patient and staff interviews, and chart audits. The major functions of a check sheet are to keep track of how frequently various outcomes occur, as well as the frequency of the processes or potential causes

that are thought to contribute to these results. Creating a check sheet entails compiling a list of prospective processes that contribute to a high-quality result. This is accomplished by populating a column with the various processes/causes leading to a given outcome using the results of an Ishikawa diagram. The data collector then checks off each time one of the possible causes/processes contributing to the outcome occurs, utilizing a number of approaches such as



clinic audits, chart audits, and patient and staff interviews. If a clinic staff member is interviewed about why they think home dialysis uptake is low, the interviewer would mark off each individual reason they give, ensuring that each reason is only counted once per interviewee. At least 50 causes (similar or different) have been observed in this process, according to some estimates. After the data has been gathered, the putative reasons should be prioritized from most common to least common, and the frequency and cumulative frequency of each supposed cause should be determined. After that, a histogram is constructed, with the most common causes on the left and the least common causes on the right. From a vast list of probable causes, this exercise assists the improvement team in identifying the short list of causes that contribute the most to a quality of care problem. Then, to address these common reasons, change concepts might be devised. ("Pareto Analysis In Healthcare", 2022)

Despite the fact that there are several types of modifications that can lead to improvement, all of them are based on a small number of change concepts. A change concept is an overarching idea or strategy to change. Despite their origins in the manufacturing business, change

principles are easily transferable to the health-care industry. Regarding interested readers, there are several resources for change concepts utilized in health care. The following three change concepts are some broad examples of change concepts that can assist stimulate change ideas.

Eliminating waste: This can be done by recycling/reusing a product (e.g., resterilising medical equipment), removing stages or resources that aren't used in a process, or matching a resource's supply to its demand (e.g., decreasing dialysis staff when the dialysis unit is not busy).

The usage of reminders is an example of a change concept that involves designing mechanisms to avoid mistakes (e.g., computerized order entry to minimize dosing errors for patients with CKD).

Changing the work environment: This notion entails enhancing staff education (for example, continuing medical education and in-service training) and properly educating staff (e.g., formal training for placing personal protective equipment).

To enable change, effective solutions to challenges sometimes necessitate creativity and ingenuity. Some of these options will necessitate improvement teams challenging the status quo (or current system) and reorganizing existing data and processes. There are several brainstorming tools available to help you come up with new ideas. I'll go through two brainstorming techniques: mental benchmarking and TRIZ exercises (theory of inventive problem solving).

By recognizing ways from other industries to handle parallel problems, mental benchmarking provides change ideas. This strategy works by stating your problem/outcome in terms of quality of care and then asking how another industry would address it. The improvement team, for example, proposes the creation of a brief 2-minute movie detailing the various home dialysis modalities, similar to the pre-flight safety videos prevalent in the airline sector, to address the issue of poor home dialysis knowledge among patients and carers.

The philosophy of innovative problem solving is known as TRIZ, which is a Russian acronym. TRIZ entails the creation of creative activities that challenge present beliefs and behaviours. A typical TRIZ exercise entails taking a quality improvement goal and asking frontline personnel or the improvement team how to ensure that the problem persists. A list of maladaptive behaviours is compiled, and the behaviours are divided into those that are currently occurring and those that can be modified to better treatment. In our scenario, if our team's goal is to boost home dialysis adoption, the team is requested to make a list of what can be done to ensure that

no patients are placed on home dialysis. This activity may provide ideas such as not educating patients about home dialysis, not holding staff meetings regarding home dialysis assessments, and not talking to patients about home dialysis. Following that, the team is asked how many of the aforementioned ideas are now being implemented to some extent, which leads to the identification of new change ideas to be evaluated. ("The Underlying Philosophy of TRIZ", 2022)

2. Explain how you will implement the solution. Indicate how you will know (Which measurement) that an improvement will take place when you implement the project. Describe the data collection plan

Now that the team has identified change ideas to address the fundamental causes of the dialysis unit's poor home dialysis uptake, the next stage in the improvement process is for them to be tested using PDSA cycles. Using PDSA, the team will be able to fine-tune their change ideas and see if they are leading to improvement. The addition of a nurse educator to the CKD clinic was the change idea provided by this analysis. The main causes of poor patient education by nephrology personnel and restricted interdisciplinary contact between nephrology professionals were addressed with this adjustment. Now it's up to the improvement team to put this concept into action and see if the modification is having the desired effect. Although the improvement team is familiar with the Plan–Do–Study–Act (PDSA) process, they are confused how to execute small change tests and communicate results to the rest of the team and stakeholders. In order to do so, the team must devise a strategy for introducing the nurse educator to the clinic. The team must define what success (or failure) criteria will be used, as well as a strategy for determining whether the change is having the desired effect in real time and responding properly if it is not.

The Model for Improvement recommends using a series of PDSA cycles in a method known as fast cycle change to accomplish this. This is an iterative process in which one cycle produces results that shape the next, and so on, until the final aim is reached. Rapid cycle change can be compared to erecting a brick wall rather than pouring a concrete floor. The placement of each brick on the wall may be scrutinized and used to determine where the next brick should be placed; however, this is not the case with the concrete floor.

In our case, the correlation would be implementing a set of initiatives across a health-care system in the hopes of enhancing independent dialysis penetrance without first testing them individually and on a limited scale. Multiple actions implemented in a haphazard manner can result in large costs and unforeseen consequences. The rapid cycle change methodology has

the advantage of allowing us to reduce risk and time and money expenditures while implementing changes that are less disruptive to our patients and colleagues. We also lessen resistance to change by starting small and learning from both successful and unsuccessful ideas and processes. Although the overall goal of our project is to increase independent dialysis rates to 30% for all new dialysis patients across a health-care system, we may not be able to achieve this goal with a single intervention, but rather with a series of interventions that have been tested locally and extrapolated to the larger community.

Every PDSA cycle is a visual representation of the scientific method. Our change concept is the starting point. Then we estimate the system's impact, implement the change, analyse the results, and use what we've learned to inform future changes.

To illustrate these stages, we use an example created by our root cause analysis: the introduction of a dialysis nurse educator into a CKD clinic.

Creating a document that sets objectives and timetables and fosters accountability on the part of the improvement team members and stakeholders is beneficial during the planning stage. The Institute for Healthcare Improvement recommends the PDSA worksheet for this purpose.

The quality improvement team put the independent dialysis nurse educator attending the dialysis clinic's change concept to the test in a real-world clinic setting. To obtain the predicted impact, several PDSA cycles were required. The first PDSA cycle failed, indicating the need for organizational modifications to the clinic's patient flow. The number of patients tested increased dramatically in the second PDSA cycle, however this rise was not sustained due to extrinsic reasons. A second nurse educator was hired in the last cycle, resulting in an increase in patient assessment for independent dialysis. Data was tracked on run charts throughout all of the PDSA cycles for the improvement team and stakeholders to visualize and comprehend. As patient assessments for independent dialysis reached target levels, the number of patients dialyzing independently at home began to increase. This paragraph backs up the findings of the root cause analysis and change idea exercises, which indicated that a nurse educator was an important part of the autonomous dialysis process.

Conclusion

Every health-care business must prioritize quality and risk management. Both management teams work to ensure that the quality and risk variables that firms face continue to improve. It is critical for new staff to understand the basic components of both quality and risk management. Understanding how each management team evaluates data and the hurdles they confront when deciding how to make the best-informed decisions is also critical. Quality and risk management are critical components of the organization because they are responsible for ensuring the facility's success by implementing new tactics to improve it.

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