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1. Introduction

Large organizations such as the Veterans Health Administration (VHA) employ thousands of employees who perform similar functions in hundreds of locations around the country. VHA recruits and trains employees to perform their jobs in a way that is consistent with an organization pledged to deliver world-class health care. Employees often discover ways to do their jobs even more effectively and without wasting precious resources. VHA leaders want all employees to understand that discovering and documenting ways to deliver services efficiently to Veterans is a critical element of his/her job. This Systems Improvement Framework is a guidebook that will share leading practices so that all employees contribute to continuous improvements. It summarizes the knowledge and experience of numerous experts who have successfully and repeatedly helped many organizations redesign systems and processes to improve quality.

This guidebook uses "systems redesign," "continuous improvement," "process improvement" and similar terms interchangeably.

Documented outcomes from previous process improvement efforts include:

- Employees find their jobs are less stressful and more enjoyable
- Veterans receive better care and faster service
- Quality of care improves
- Waste is minimized

Purpose of This Guide

As a VHA employee, you have a vested interest in providing quality care to Veterans. Veterans often judge their care by observing “how the system works” to respond to their requests, needs, and welfare. Paradoxically, you may feel powerless to understand or change the system. This guidebook aims to change that! It offers a step-by-step framework to systematically improve the performance of the system. If you are new to process improvement, this guidebook will help you get started and explain what must occur if you want to succeed. If you have been part of a process improvement team in the past, this guidebook will provide a useful refresher of concepts and approaches. If you are a process improvement expert, you may find this useful for your teams. Please send us your comments and suggestions for future editions of the guidebook. Contact: Fabiane.Erb@va.gov.

This guidebook will provide you with what you need to know to successfully perform systems redesign work, including basic information about:

- Improvement principles, methods, and practices
- Relevant applications of systems improvement knowledge
- Organizational change strategies
• Skill in process redesign\(^1,\)\(^2\)

**Existing Process vs. New Process**

This guidebook focuses on improving systems or processes that are already in existence. However, many of the principles and tools are useful when creating a new process. Leadership engagement and support is crucial if a new process is to be implemented on a local level or across VHA. New processes require the vision of a change champion. The team will explicitly articulate this vision in an aim statement, so that the intent of the new process is clearly understood and can be communicated to relevant stakeholders who will either be directly engaged in the new process or have the authority to approve its implementation. Refer to the guidebook sections on Principles of an Effective Aim Statement and Tips for Setting Aims in Chapter 4, Team and Aim, for more information. After the aim is established, a stakeholder team will determine the steps to implement the new process. The conventions, such as use of a Project Charter, are relevant for starting a process from scratch as well.

Once a change team is operational, they will map the new process with consideration of all stakeholders. Process Flow Diagrams are provided in Chapter 5, Map and Measure. When preparing to test the new process, Checksheets and Process Observation Worksheets (also described in Chapter 5, Map and Measure) will help review process performance. If the change team agrees that the newly-designed process flow appears ideal, they will test the new process on a small scale through the use of Plan-Do-Study-Act (PDSA) cycles, as described in Chapter 6, Change. The team will apply further iterations or PDSA cycles to refine the new process until the intended outcome is realized. The principles outlined in Chapter 7, Sustain and Spread, will ensure widespread diffusion of the new process.

**Current and Historical Improvement Efforts in VHA**

**History of improvement models**

The idea of improving product and service delivery has a long history. Some methods have endured because of their proven success. However, not all of these methods employ the same approach or involve exactly the same steps. A brief recap of the names of notable and successful systems redesign/process improvement efforts follows.\(^3\)

**Current status of systems improvement in VHA**

Many people in VHA have made commendable efforts to promote systematic, practical process improvement. While the intent is to

<table>
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\(^3\) Davies, Michael. *VA Summit: What will we decide is our improvement framework & curriculum?*, June 2009.
improve, many approaches caused confusion and re-work. This guidebook aims to standardize VHA's approach and language.

VHA has chosen to adopt an "un-branded" practical framework intended to simplify the work. A common approach to improvement, language, and understanding will facilitate training and sharing.4

**Desired state of systems redesign in VHA**

The point of process improvement is to achieve our mission of providing excellent care. This requires every leader in the organization to embrace leadership and skills in not only doing improvement work personally, but also in leading and creating an improvement culture. Model cultures have a rich investment in improvement professionals who are closely connected to leadership and are driving the leadership agenda. Improvement professionals help facilitate, lead, and achieve results.5

Successful organizations instill a culture of continuous process improvement to promote the core values of feedback, engagement by all employees, calculated experimentation, discipline, and standardization. The culture values the improvement process more than individual results.

This guidebook discusses the ways to instill a universal passion for improvement among all employees. VHA employees have learned that continually reducing the risk of harm to Veterans is a priority. At the same time, process improvement requires a spirit of calculated experimentation. This does not mean that VHA will tolerate greater risk. It does mean employees should not be content with "the way we've always done things." Leaders at every level must demonstrate their personal commitment to improvement and utilize every available means to encourage a passion for improvement among VHA employees.6

**Vision-Analysis-Team-Aim-Map-Measure-Change-Sustain (VA-TAMMCS) framework**

Following a systematic process greatly increases the chances for successful systems redesign. To that end, VHA offers VA-TAMMCS, as a roadmap to success:

1. **Vision**: Leaders identify potential areas for improvement reflecting an integration of the strategies, resources, and performance goals identified at the VA, VHA, Network, and Medical Center levels. These opportunities focus on the key drivers of VHA healthcare: Veteran-centeredness, quality, effectiveness, equity, and efficiency of healthcare delivery and services.7

2. **Analysis**: Narrowing the focus from the vision, leadership mines the broad opportunities into specific priorities most amenable to action and change. When indicated, chartered teams will assess and improve key processes to ensure implementation of change and sustain strategies.8

3. **Team**: Teams will plan and implement improvement plans and projects. Recognizing that the people who DO the work on a day-to-day basis are those who can best transform the work, it is important to ask: Does everyone who touches this process have a say in the process changes? Teams work best when they have clear sponsorship from

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4 Davies, Michael. VA Summit: What will we decide is our improvement framework & curriculum?, June 2009.
6 Davies, Michael. VA Summit: What will we decide is our improvement framework & curriculum?, June 2009.
executive leaders. They also need front-line staff who have integrity and are passionate around improvement. They need a facilitator, or improvement professional, who has deep knowledge and skill doing improvement work. Needed training can be done “just in time.”

Balance the team size. Small teams often move faster than larger teams, but they must include all stakeholders. Large teams must not get bogged down in process steps. They should spin off subgroups to work out technical details. While not traditionally done, including a patient on a team will bring a mindfulness of mission and a customer perspective that is sometimes missing. Sponsors and team members invest time in focusing on the problems at hand, meeting, and testing changes to measure progress. Sponsors lead and support the work of improvement teams, making weekly or bi-weekly contact. The following is a checklist of questions to ask when identifying team members:

- Does the team leader have the skills and willingness to do the job?
- Does the team leader understand and support the team goals, resources, and timeframe?
- Does the team have a skilled facilitator to organize, arrange, teach, help, and communicate whatever is needed to achieve the aim?
- Does the team include the appropriate disciplines?
- Does the team include a patient? If not, how is their viewpoint represented?
- Is the team “the right size” for the task at hand?
- Is each team member committed to accomplishing the aim?

4. **Aim**: What is your team’s aim or goal? If the team members cannot describe the aim in one or two crisp sentences, they may be unclear about their task. If teams lose focus on their aim, they get lost and are ineffective. It is common for teams to invest a few hours, days, or even weeks in clarifying and achieving buy-in around the real aim. They should write a clear, measurable aim statement in a sentence or two that describes the WHAT and BY WHEN. Aim statements focus on VHA’s priority: the patient experience (in clinical services); or the support of patient experiences (in administrative services) – even if they are removed a step or two. Teams sometimes set more than one aim. In addition to clarifying the improvement work at hand, well written aim statements help identify the end of the work. The following are some additional guidelines to consider when establishing aim statements:

- **State the aim clearly**: Teams make better progress when they are very specific about their aim(s). Be brief; a single sentence is best.
- **Base your aim on data**: Examine data that your department has on the particular process under study. Remember the best aims address either timeliness or reliability goals. Focus on issues that matter to your patients and to you.
- **Include measurable goals**: Numerical goals clarify the aim, direct the measures of improvement, and focus initial changes. For example, setting an aim such as “Reduce the delay from decision to discharge from a medicine unit to placement in the Skilled Nursing Facility (SNF) from 7 days to 1 day by July 1st, 2009” is measurable. “Reduce delays in patients moving from medicine unit to the SNF” is not. Some additional measurable aims follow:

  i. “Our aim is to offer patients appointments today for any problem, urgent or routine, by July 1st.” This is a timeliness aim statement that tells what (offer

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patients appointments today), is measurable by a clearly understood measurement (e.g., offering “today” is commonly measured by using the “third next available” measure), and by when (July 1st).

ii. “Our aim is to reduce the time from selection of a new employee to the first day of work from 60 days to 7 days by December 1st.” This is also a timeliness aim that explains the what (reducing delay for new employee “Entry on Duty” date and by when is December 1st). This process is measurable.

iii. “Our aim is to increase the use of all elements of the central line bundles to 100% by December 1st.” This is a reliability aim statement that explains what (use all elements of the bundle) and by when (December 1st) and is measureable.10

• Set stretch goals: Setting stretch goals immediately tells people that the status quo is not an option. For example, “assure superior satisfaction for more than 95% of patients.” Leaders make it clear that the goal cannot be met by simply tweaking the existing system. Stretch goals should be ambitious enough that they are indeed a “stretch,” but not so ambitious that teams assume they are impossible to meet and quickly lose interest. Once this is clear, team members will begin to see how barriers to achieving the stretch goals can be overcome.

5. Map: Have you drawn a picture of the process? Flow mapping clarifies the start, end, and key decision points for a process. The experience of flow mapping allows teams to agree on the process and discover value to the patient or customer, non-standard and unreliable processes, and the re-work that is involved. Flow mapping leads to ideas for measuring and improving the process.

Flow-mapping requires sustained discipline from every team member. In flow-mapping, nothing should be taken for granted, and every team member should be in agreement that the final map accurately represents the process as it really exists.

Flow mapping can occur at a very high level, or at a much more detailed level. For example, at a high level, the hiring process could involve three steps: recruitment, selection, and orientation. That same process flow-mapped at many facilities resulted in as many as 145 steps. The facilitator and team must choose the appropriate level of detail. An appropriate level of detail allows identification of mistakes, rework, and non-value added steps. Flow maps often use circles to represent the start and end of a process, rectangles to represent steps, and diamonds to represent decision points.

The goal is to visualize and understand existing processes, while discovering improvement opportunities. The team uses the “current state” map to visualize an ideal process.11

6. Measure: How do you know a change is an improvement? In order to recognize improvement and manage by fact, not feeling, we are obligated to measure. Measurement must be “good enough” to support the team’s aim. “Perfect” measurement as would be required for a research study is not necessary. Therefore, teams should not spend all of their time on measurement, but use measurement to both “diagnose” the current state, including the constraints, and to visualize the general direction of change.

Effective measurement contributes to team learning and minimizes individual lobbying for any one point of view.

7. **Change:** *What changes will result in improvement?* Two critical issues affect this area of change: first, focus on considering change **principles**, not necessarily “best practices” or strategies; and second, use “small tests of change” as embodied in PDSA or an equivalent approach, before attempting large, system-wide change.

- **Principles:** *Principles* are “universal truths” in system redesign. Teams can accept the underlying details or **strategies** as change ideas that are consistent with a principle. Certain change principles will work better for a given situation, and teams should feel free to adopt, modify, or create change strategies that work best for them, consistent with the principles. Examples of available principles include balancing demand and supply, decreasing backlog, decreasing queues. While further discussion of these principles is beyond the scope of this handbook, remember these may be topics for just-in-time training, research, or idea-mining.\(^{12}\)

- **Testing:** Teams test and adopt change through PDSA (Plan-Do-Study-Act). PDSA, also known as PDCA (Plan-Do-Check-Act), requires doing small, rapid tests of change. The power of PDSA is the cumulative effect of small changes and the ability to try ideas on a small scale, fine-tune them, build consensus, and then generalize the change on a larger scale.\(^{13}\)

8. **Sustain:** *If everyone on your team retires, how do you know these change strategies will continue to be used?* “Sustain” strategies require us to first think about previous successful changes. Then we think about the process and task changes that resulted in the success. Next, we must “memorialize” those changes by assigning responsibility, changing job descriptions, evaluations, reward systems, policies, and new employee training. Ongoing measurement of the key processes sustains change. Previous improvement efforts have failed, because the appropriate system changes and safeguards were not in place to assure the new processes were supported.\(^{14}\)

9. **Spread:** *How can we share what we've learned with persons who could apply this knowledge to improve services they provide?* Many good ideas can be applied in more than one VA facility. "Spreading" new developments to other units and work areas can multiply the value of the improvement. VHA leaders have a responsibility to help teams apply what other teams in similar situations may have already discovered. Senior leaders must clearly demonstrate their commitment and support for proposed changes, because without their support, many of the best ideas will never be adopted. Communication and teamwork enable improved, safe, efficient care. Positive team relationships move our systems forward. Communication requires effort.

This VA-TAMMCS Framework will form the backbone of your team’s change work performed at VA. Historically, many improvement efforts have failed, because one or more of the nine basic elements noted here were absent. Choosing and using a consistent improvement framework to organize the improvement effort serves to clarify and facilitate the ongoing work.


\(^{13}\) Davies, Michael. *Systems Redesign Framework for Improvement (TAMMCS)*, 2009.

Creating a Culture of Continuous Improvement

A recent study of 12 health-care organization transformations found that five interactive elements lead to provision of consistent, safe, high-quality care. These five elements are:

1. **Impetus to transform**: While the impetus or desire for change may come from inside or outside the organization, it must be supported over time to motivate and engage staff in change efforts.

2. **Leadership commitment to quality**: Senior leaders drive change in two ways. They set the organization’s course, and they reinforce direction and expectations with resources and accountability.

3. **Actively engage staff in problem solving**: Changes last when they are visible, easier to perform, more reliable, and more efficient. Employees who serve on improvement teams often learn new skills around identifying and solving problems and using data to support conclusions. They become enthusiastic champions of changes they have recommended. Finally, success builds more success. Improved care of patients is the goal of every properly-motivated health care worker.

4. **Align resource allocation and other actions at all levels of the organization**: Plans, processes, information, resource decisions, performance measures, incentives, and other actions must support key improvement goals. Accountability is another important component of alignment.

5. **Bridge boundaries among organizational components**: At the front line, successful systems integrate care through improvement teams involving all relevant disciplines. They emphasize communication and collaboration.\(^\text{15}\)

In a recent discussion among VHA and other improvement experts, all agreed that critical success factors to determine whether a culture of continuous improvement is realized also include the availability of staff time and a culture of learning.

**Leadership Principles**

At a conference held in June 2009, a group of VHA leaders involved in process improvement and systems redesign talked about principles participants in improvement efforts need to know. The leaders came to a consensus on a number of leadership principles, which need to be in place for VHA’s systems redesign efforts. The following are some of these principles:

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<td>• Help employees understand how they are personally connected to the mission</td>
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<td>• Connect all work to the care of Veterans</td>
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<td>• Engage all of the employees to achieve optimal value</td>
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<tr>
<td>• Hold leaders responsible for creating an environment where all employees can improve their work</td>
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<tr>
<td>• Ensure that employees do the following:</td>
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<tr>
<td>Learn the language of improvement</td>
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<tr>
<td>Understand the importance of their role in providing excellence in care, as defined by the</td>
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\(^{15}\) Lukas, Carol VanDeusen et. Al. *Transformational change in health care systems: An organizational model*, 2009.
Leadership Principles:

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<td>Recognize the potential benefits of risk taking</td>
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<tr>
<td>Be aware of the importance of ethics in making choices</td>
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<tr>
<td>Learn about the resources available</td>
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<tr>
<td>Understand the time commitment needed for improvement teams to succeed</td>
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- Principles from the patient safety environment, such as “glitch-hunting” rather than “witch-hunting,” enable employees to be honest about outcomes that are less than desired
- Provide employees with opportunities for learning in order to make it easier to engage them
- Provide every employee necessary skills to improve their work
- Explain the purpose of measures throughout the organization, so employees have a clear understanding of the desired improvement underlying the measure
- Enable optimal performance through both individual and organizational learning, as well as consistency in values
- Encourage the organization to become a learning organization that learns from its own experiences
- Document individual and organizational learning by measuring the spread and sustainment of an improvement initiative
2. Realize Transformational Change

VHA has a proven history of realizing transformational changes that have resulted in sustained systems improvement. Commonalities are apparent across successful VHA transformation initiatives. An understanding of the common success factors provides lessons learned and prepares staff with an understanding of what is required to develop sustainable improvement.

**Define Transformational Change**

Transformational change shifts the culture of an organization by delivering substantial change to a system, process, or idea that the organization has used in the past. It is not a simple improvement over the past way of doing things. This type of change usually involves radical new thought, approaches, and action to elevate the organization to a higher level of excellence. In order to ensure the change is organization-wide, transformational change must be enacted over a period of time, best accomplished in increments. This allows for a sustainable change that has been adopted throughout the organization.

**Success Factors of Transformational Initiatives**

Successful and sustained transformational changes at VHA share the following similar characteristics:
Success Factors:

- Leadership provides strong support
- Team articulates a clear vision for the initiative
- Aim follows a moral imperative (or "pull") around the Veteran
- Initiative focuses on benefit to the Veteran
- Change initiative champion displays persistence
- Team takes a respectful approach to improvement
- Front-line staff drives the initiative
- Front-line staff assume greater control
- All stakeholder groups are willing to collaborate in partnerships
- Early adopters gain rewards and praise
- Team creates formal and/or informal communities of practice (e.g., steering committees, panels)
- Team develops mechanisms for spreading information
- Team provides staff development opportunities through customized learning and training approaches
- Team provides flexibility of choice of how to implement
- Team obtains direct, on-site technical support from internal consultants or the change champion
- Team implements metrics to measure progress and success
- Team makes a successful business case, with the benefit measured in terms of cost savings, quality, or patient-staff satisfaction
- Project captures the hearts and minds of participants

Examples of Successful VHA Transformations

During a Systems Improvement Summit held in Salt Lake City in June 2009, VHA leaders were asked to provide examples of successful VHA transformational changes. In addition to identifying examples, participants were asked to consider the following questions as they pertain to each of the successful transformational changes:

- What was the change?
- What made the change transformational?
- What organizational needs does/did it address?
- What makes/made it successful?
- How do/did you sustain and or spread the transformation?

A sample of the responses is provided below. Additional examples are included in Appendix A.

Learning organization

VHA strives to be a learning organization, continuously looking for ways to improve all processes and systems. The learning organization concept was considered to be transformational when it was introduced within VHA. It represented a shift in VHA's educational model from traditional staff education to a culture in which learning is embedded in daily work. It also enabled VHA to systematically capture learning-related data for the first time through the learning organization survey tool, introduced as part of this initiative.

The learning organization initiative has momentum, because it represents true collaboration across stakeholder groups and across multiple VHA offices. All levels of staff formed partnerships and, in doing so, created a sense of ownership. Dissemination mechanisms were employee-focused. Additionally, useful external collaborations targeted linkage with other healthcare organizations. Initial ambiguity in the definition of the initiative allowed for local
flexibility and customization. In order to sustain and spread the transformation, VHA hosts educational summits to perpetuate learning. Designated learning officers (DLOs) in each facility also provide "on the ground" support of the learning organization. The learning organization concept has since been married to concrete processes through the use of consistent tools.

**VHA’s transition from nursing homes to community living centers (CLCs)**
VHA has recently undergone a transition within long-term care from offering nursing home services to providing care in CLCs. This transformation entailed a paradigm shift from a sickness model of service delivery to a wellness model, in which patients are empowered partners in care. The CLC transformational initiative addressed VHA's need for improved long-term care services in light of the aging Veteran population and the increased need of appropriate services for OEF/OIF Veterans with debilitating injuries.

The CLC initiative was successful, because ownership belonged to front-line staff. The initiative started at the ground level and leadership soon recognized that the effort was worthwhile. The CLC program had a clear vision and a sense of urgency, given the increasing number of Veterans requiring extended care. The initiative champion exhibited strong persistence and was able to gain leadership and public support, due to the distinct moral element (or "pull") to provide Veterans with the care they deserve. Additionally, when the program was initially launched, the champion held face-to-face meetings to introduce the CLC concept to key stakeholder groups. In order to sustain and spread the transformation, the team created feedback mechanisms to evaluate implementation of the change, such as unannounced surveys and consultations with long-term care experts. A field-based steering committee comprised of staff at all levels guided the CLC transformation and drafted a directive. Lastly, the initiative champion succeeded in making CLC transformation a high priority by incorporating it within VHA's strategic plan.

**VHA Nursing Academy**
VHA has sought to increase collaboration with nursing schools across the country in order to mitigate the impact of the nationwide shortage of nurses. Through the establishment of the Nursing Academy, VHA has been able to increase the number of staff available for patient treatment, while providing nursing schools with a venue for students to gain practical experience. The Nursing Academy represented a win-win relationship for engaged parties, driven by the Deputy Under Secretary. In order to sustain and spread the transformation, nurses receive staff appointments, increasing retention and recruitment.

**Inpatient Evaluation Center (IPEC)**
IPEC assists VHA facilities with implementing evidence-based practices. IPEC provides mentoring for struggling sites. IPEC starts with a web-based kick-off live meeting and conference call, which lasts for two hours. During this kick-off meeting, experts take twenty minutes to talk about a problem and why implementing the related evidence-based practice will be successful. Field employees, who have piloted the evidence-based practice, discuss their respective experiences, with an emphasis placed on issues encountered and success factors. The IPEC initiative provides VHA with a system to understand inpatient needs and processes. It is designed as a "convenience store model," offering outcome measures and implementation support.

The IPEC initiative was initially introduced to a broad array of field staff (e.g., every nurse manager, intensive care unit (ICU) physician, respiratory therapist). IPEC's evidence-based practices are grounded in existing data and literature. The IPEC's champion did not waste effort trying to change opinions of naysayers, although these people still had to report their performance measures. The program had leadership support, and offered to mentor struggling sites. In order to sustain and spread the transformation, IPEC employees examine the concerns
of field staff. When questioned, IPEC operates under the assumption that the evidence-based practice is correct and works to prove its efficacy. IPEC also maintains a SharePoint site, containing tools, slides, and data reports used to widely disseminate information across VHA.

**Sustaining and Spreading Transformational Initiatives**

The descriptions of select VHA transformational initiatives outlined above describe how each has been able to sustain and spread their respective change. Key elements for sustainability and spread that increase the likelihood of successful improvement efforts include the following:

<table>
<thead>
<tr>
<th>Key Elements for Sustainability and Spread:</th>
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<tbody>
<tr>
<td>• Ongoing measurement</td>
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<tr>
<td>• Organizational accountability driven by a champion</td>
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<tr>
<td>• Effective communication to enable information to spread</td>
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<tr>
<td>• Win-win initiatives (win-win may have to be created if not obvious)</td>
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<tr>
<td>• Ongoing training</td>
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<tr>
<td>• Clear competencies and standards of practice</td>
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<tr>
<td>• Incorporation of changes into daily operations</td>
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<tr>
<td>• Clear expectations within structure of the organization through policies, guidelines, directives, and minutes</td>
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<tr>
<td>• Resources and support</td>
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<tr>
<td>• Clear process owners at all levels</td>
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<tr>
<td>• Staff ownership and buy-in</td>
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<tr>
<td>• Evaluation or assessment mechanisms</td>
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</tbody>
</table>
3. Vision and Analysis

The Vision and Analysis section of the framework is pre-work to the TAMMCS framework previously used by VHA. These steps of the framework pose the following questions:

- Where are we currently?
- Where do we want to be?
- Which project are we going to do?

**Vision**, the first part of the VA-TAMMCS framework, emphasizes the importance of leadership in identifying the project’s mission. Leaders develop and communicate the VA, VHA, Network and facility mission, vision, and values to Veterans, patients, family members, staff, and the other customers.

The analysis establishes priorities to identify the most important areas on which to focus improvement efforts and evaluate performance. The leaders analyze facts and data as a basis for effective decision making. They determine cause-effect relationships and guide the management of work processes to achieve desired goals or business results. Facts and data alone do not provide an effective basis for setting priorities and developing action plans.

**Vision**

Vision comes first. Leaders develop an organizational strategy, long-range and short-range goals, and an improvement plan to provide vision, direction, and oversight of all performance improvement activities. The plan defines an integrated approach to organizational performance management and should address improving value to Veterans, staff, and other customers, better health care quality, organizational sustainability, organizational effectiveness, and continuous organizational and personal learning. The plan can also address and evaluate key processes, outcomes, opportunities for learning, the adoption of ideas, processes, technology, or business models which may improve health care quality and service. The plan will reflect an integration of the strategies, resources, and important measures identified at the VA, VHA, Network, and Medical Center level. It will focus on the key drivers of Veteran-centeredness, quality, effectiveness, satisfaction, equity, and efficiency of healthcare delivery and services. “V” also stands for Value as defined by the customer, usually the Veteran served by VHA.

Improvement plans could entail designing efficient processes to optimize the length of hospital stays, reduce treatment errors, and analyze resource and asset use. Executing the improvement plan may include staff training in setting priorities based on cost benefit. Evaluation activities may emphasize process efficiency, cost per patient, and/or health care quality.
Case Study:
A VA facility had been unsuccessful over two years in its efforts to implement "advanced access" with one pilot team. They invited a small group of outside observers to assess the situation. After carefully listening to front-line staff for two days, the observers noted two themes: First, the staff believed that advanced access was designed to discourage frequent follow-up appointments with patients, but delivering quality care required frequent follow up; second, "no evidence" existed that facilities "like us" (rural, non-affiliated) were successful in doing advanced access. In short, they believed, "we’re different." Clearly, the front-line staff were not on board with the change.

Subsequently, the team organized a retreat with all staff and provided a complete explanation of advanced access, along with an extensive, two-way dialogue. In addition, testimonials from staff at a similarly-situated facility extolled the improvements in their own work life. This was the turning point. The entire team became engaged and embraced the hard work of backlog reduction, a necessary change to reach the aim of improved access. Change proceeded successfully.

Vision Tool: Management Guidance Teams
Management Guidance Teams get leadership involved up front to identify the project focus area. The Management Guidance Team may include hospital administrators, departmental managers, and key clinicians that are stakeholders within the sponsoring organization and/or the process under investigation. Jack Silversin would describe the team composition as a combination of Champions and Sponsors (refer to Chapter 4, Team and Aim, for more information on Jack Silversin's team roles). Management Guidance Team sessions typically consist of two one-hour sessions, held on an as needed basis. The objectives of these initial sessions are to:

- Identify opportunities for systems redesign
- Develop the opportunities into a formal systems redesign project
- Charter the project team(s)

The expected outcomes from the Management Guidance Team sessions are:

- Identification and ranking of potential opportunities for systems redesign
- Project charter development
- Project team selection

Another more effective way for these Management Guidance Teams to meet is through retreats. Regardless of the duration, retreats provide the Management Guidance Team with an opportunity to remove itself from the rest of the organization and focus on the previously mentioned objectives.

Once the prioritization of opportunities, project charter, and team nominations are unanimously accepted by the Management Guidance Team, the team will draft a memo to the staff announcing the following:

- Final charter
- Final team membership
- Expectations for the deliverables and milestones for those deliverables

Vision Tool: Issue Identification
In order to identify the project focus area, the project team will clearly identify all of the project issues and opportunities. This deceptively simple but critical step is often difficult to execute.

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successfully. In this step, the team must identify a list of all the potential issues to address. The following is a list of key success factors in issue identification:

- Be proactive in identifying issues
- Characterize each issue
- Clarify each issue by listing the improvement goal

Once the project team has clearly identified all of the relevant issues, the next stage in the process is to prioritize and narrow the list of issues. During the Analysis phase of the framework, the project team will analyze the priorities in process improvement to develop an effective resource plan to optimize the use of human capital.

**Vision Tool: Affinity Grouping**

In affinity grouping, members organize their ideas and identify common themes into something called an affinity diagram. Affinity diagrams collect and organize input from across a group or team in order to identify opportunities to apply systems redesign. This technique is similar to brainstorming, except that ideas from team members are compiled through written means, rather than intense discussion (refer to Chapter 5, Map and Measure, for more information on brainstorming). When compared to brainstorming technique, affinity diagrams often provide the greatest opportunities for equitable, objective input from all team members.

Affinity groups take the following steps:

1. Write ideas on individual cards or adhesive notes.
2. Randomly place cards on a table or place notes on flip chart paper taped to the wall.
3. Without talking, each person looks for two cards or notes that seem to be related and places these together, off to one side. Others can add additional cards or notes to a group as it forms, or they may reform existing groups. Set aside any cards or notes that may be contentious.
4. Continue until all items have been grouped or set aside. There should be fewer than 10 groupings.
5. Discuss the groupings as a team. Generate short, descriptive sentences that describe each group and use these as title cards or notes. Avoid one- or two-word titles.
6. Move items from one group to another as consensus emerges during the discussion.
7. Consider additional brainstorming to capture new ideas, using the group titles to stimulate thinking.

**Analysis**

Prioritizing key processes will allow you to evaluate the items against key business drivers in order to identify the most important items to improve and measure in evaluating performance. You will apply priorities to determine when an improvement action is indicated, based on the analysis of data collection, or the outcome of a sentinel event.

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Consider the following questions when identifying the most important functions, processes, systems, or outcomes to measure:

- Does the process affect a large number of patients/associates? (High Volume)
- If the process is not performed well, does it place people at high risk?
- Is the function known to be problem prone?
- Do VHA and/or other regulatory bodies require this performance measurement?
- Is the process critical to the operation of the program?
- Does it support staff views of improvement opportunities?
- Does the process support patient needs and expectations?

When determining the need for an improvement action, such as a Performance Improvement Team within a program, consider the following questions:

- If no actions are taken, will patient care be compromised?
- Does the proposed action support the mission and vision of the VA, VHA, VISN, and Medical Center?
- Are resources available (people, resources, time)?
- Is the process a customer service issue?

When you must choose between several improvement activities, use a prioritization grid to assist in evaluating the items against specific criteria.

Once leadership determines the improvement priorities, decisions are made regarding the need to organize a team to improve the process: selecting the "right" people to serve on the team; identifying the resources available for the improvement effort, such as people, time, money, and materials; setting reporting requirements; and determining the team's level of authority. These elements may be formalized in a written charter (refer to Chapter 4, Team and Aim, for more information about team charters).

**Analysis Tool: Assessment Readiness**

In order to make a business plan for change, look for the 90% solution. The business plan states the resources that will be needed and estimates potential gains in performance. Necessary resources include:

- Facilitation effort. What do you have to do to make sure the plan is followed?
- Provider and administrative effort. Do you have the necessary people available to help?
- Patient effort. The less you require of patients, the more likely the change will stick.
- Material resources ($). What is your budget?

Initially, target interventions with people and processes that maximize potential return on investment. Then reassess and decide if more work is needed. Often the most gain can be obtained with minimal investment. These are called "90%" or "90/10" solutions.

Using an example from the Colorectal Cancer Care Collaborative (C4), let's say that in your facility providers must actively check lab results for positive fecal occult blood test (FOBT). The rate at which they look up lab results is unknown. We will measure it, and if we find out that the rate is low, we will undertake an intervention to change the providers' behavior. Then we learn from other teams that emailing results to providers or using view alerts is associated with a
higher referral rate in their facilities. It will take less effort for us as change agents to initiate active notification of results than to study the matter further. It will also take less effort to give the providers lab results than to get them to regularly look them up. Therefore, targeting a system change that supports providers by lessening the effort required to do their jobs is an example of harvesting low-hanging fruit. It delivers more positive change with less effort from everyone.

Sometimes you cross a chasm in one step. Let’s say you can’t pin down a 90/10 solution. For example, you may have small, diffuse performance gaps across the gastro-intestinal (GI) preparation and appointment adherence part of the process that add up to a big problem. No single intervention target stands out as a major contributor to the performance gap. If both preparation adherence and appointment adherence in GI need to be changed, then this may be more readily accomplished as a single system redesign effort, rather than successive piecemeal interventions.

Staging sequential interventions – sometimes you DO carefully cross a chasm in two steps. Think about what effect the proposed intervention will have on downstream processes. You may need to target your first intervention at a point further along in the task model to prepare for increased demand that may result from the main intervention. For example, a low referral rate and the availability of a low-cost intervention may make the referral system a reasonable quality improvement target. But what effect will this have on other processes? If you have a process to ensure appointment and preparation adherence rate, increased referrals will put more demand on those systems. Will the current appointment and preparation adherence rates hold up or decline? What kind of intervention targeted at the preparation education and appointment reminder systems will maximize their ability to deal with demands generated by increased referrals?20

Analysis Tool: Benchmarking against "Best Practices"
The team must gather background information and best practices to establish a clear picture of how the status quo needs to be changed. The team should use a combination of published sources and expert advice to develop a description of best practices that will serve as a goal of the improvement process.

The team members will begin gathering information on best practices by familiarizing themselves with available knowledge (also known as “best thinking”) relevant to the issue they have chosen to address. This may include standards and guidelines, consensus statements, scholarly publications, precedent cases, institutional policy, and law. The team will generally review journals, texts, and online resources on ethics in health care organizations. In addition, it may be helpful to examine codes of ethics for relevant professional groups, such as social workers, physicians, researchers, health care executives, or accounting professionals. Team members will familiarize themselves with applicable local and national VA policy, as well as reports from national commissions, the Institute of Medicine, the American College of Healthcare Executives, or other learned bodies. Staff at other VA and private facilities who have faced similar issues may offer helpful suggestions and lessons learned.21 The goal is to understand and to develop a vision, based on a well-grounded description of “best practice” and lessons learned from similar teams. The team will customize this vision to fit local circumstances.

Analysis Tool: Project Selection Matrix
A project selection matrix ranks and compares potential project areas to determine which should be implemented. Ranking criteria may include, but are not limited to:

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Systems Improvement Framework

- Organizational and strategic goals
- Potential financial impact to the organization
- Effect on patient and employee satisfaction
- Likelihood of success
- Completion within a specified timeframe (typically 8-12 weeks).\textsuperscript{22}

An example of a project selection matrix is included in Figure 1; arbitrary scores are used:

<table>
<thead>
<tr>
<th>Criteria:</th>
<th>Project:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Likelihood of Success</td>
<td>5</td>
<td>10</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>$$ Impact (cost or revenue)</td>
<td>10</td>
<td>5</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td>10</td>
<td>4</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Employee Satisfaction</td>
<td>10</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Completion in 4-6 weeks</td>
<td>1</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

\textit{Figure 1: Project Selection Matrix.}

**Analysis Tool: Root Cause Analysis**

How do you identify the causes of the gap between current practices and best practices? One of the more common methods is root cause analysis (RCA), which is often applied to patient safety incidents. VA policy defines root cause analysis as “a process for identifying the basic or contributing causal factors that underlie variations in performance.” A root cause is “one of multiple factors (events, conditions, or organizational factors) that contributed to or created the proximate cause and subsequent undesired outcome and, if eliminated or modified, would have prevented the undesired outcome.” Typically, multiple factors contribute to the gap between current practices and best practices.

In the event that you would like to perform RCA using patient data, coordinate the effort with the Office of Patient Safety. RCAs using patient data are non-disclosable, because they contain private patient information.

Successful RCAs have the following characteristics:

- Focus primarily on systems and processes rather than individual performance
- Investigate the underlying systems through a series of “why” questions
- Continue until all aspects of the process are reviewed and all contributing factors are considered
- Identify changes that could be made in systems and processes either by redesigning existing processes or by developing new processes or systems that may improve performance

Just as mapping the process behind a practice requires collecting information directly from people who are involved, identifying the major causes of a quality gap also requires input from front-line staff who know and use the process. Second-hand conjecture about other people’s motives is unreliable. For example, program staff may believe that elderly patients avoid automated telephone help systems, because “they would rather talk to someone face to face,”

when the real reason is that these patients have slow reaction times and cannot push buttons in the time allowed.23

Root cause analysis is a great method for identifying potential projects for your team to improve. The next section will discuss how to build and maintain effective teams, along with building a group consensus around a common aim or goal.

**Analysis Tool: Applying Analytic Skills**

Applying analytic skills involves utilizing basic biostatistics and epidemiology techniques to translate data into meaningful recommendations for clinical practice or administrative support functions. Employees who are knowledgeable about sources of data (information) available within VHA and who can evaluate data sources for relevance, accuracy, comparability, integrity, and data gaps should consider this technique. They can examine multiple sources of data and make meaningful connections that can lead to choices about systems redesign priorities.

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4. Team and Aim

The Team and Aim section on the VA-TAMMCS framework poses the following two questions:

- Does everyone who touches this process (key stakeholders) have a say in the process changes?
- What is your team's aim or goal?

People who DO the work on a day-to-day basis, the team, must transform the work. The team must be able to clearly answer the aim question in one or two concise sentences in order to fully understand the task at hand.

Who should be on your team? Your team needs clear sponsorship from executive leaders. It needs front-line staff involved with the process to be improved, who are passionate about improvement. It needs a facilitator or improvement professional who has deep knowledge and skill in improvement work. All of these must be unified around a common aim or goal. Note that the project's aim is a particular goal or outcome, not the project's vision as defined in Chapter 3, Vision and Analysis.

This chapter will help you define your team and aim. It will also provide several tools and techniques that can be helpful.

Team

Types of Teams

Everyday, people encounter a wide assortment of tasks in the workplace which are best addressed by working together in groups or teams. Just as there is a lot of variety in the type of challenges these teams may face, there are a number of types of teams for differing circumstances, both formal and informal. The following is a description of several potential team types, as depicted in Peter Scholtes' The Team Handbook.

Project teams

Project teams are temporary, have a special focus, and often have both core and resource members. Core members participate throughout the project and often have complementary skills needed for the work output. Resource members may only be critical for specific phases of the project and may move in and out of the team as work progresses. Improvement teams, problem-solving teams, and product development teams are examples of project teams.

Ongoing, or functional work teams

Ongoing or functional work teams are permanent, or at least long-standing:

- A natural work team involves all the people in a given work area who share responsibility for completing a whole piece of work. These team members sometimes cross-train to learn each other's jobs.

- A self-directed work team is a natural work team that also shares many management responsibilities, such as scheduling work, managing budgets, evaluating performance, and hiring new team members.

Section Takeaways:

<table>
<thead>
<tr>
<th>Team</th>
<th>Types of teams</th>
<th>Team roles</th>
<th>Project team composition</th>
<th>Project charter</th>
<th>Stages of Team Formation</th>
<th>Clinical Microsystems</th>
<th>The Three &quot;Cs&quot;: Content, Context, Community</th>
<th>Aim</th>
<th>Principles of an Effective Aim Statement</th>
</tr>
</thead>
</table>

A process management team focuses on sharing responsibility for monitoring and controlling a work process, such as new product development. Members may be full-time or part-time. Members may rotate on and off the team on a yearly basis.²⁵

Virtual teams
Virtual teams use technology-supported communications more frequently than face-to-face interactions to accomplish their tasks. They cross boundaries, such as time zones, geography, and organizational units. Both project teams and ongoing teams can be virtual. Three actions are key to the success of any team, but are especially critical for virtual teams:

1. Developing shared goals and methods to accomplish outcomes
2. Developing methods and skills to communicate and make decisions across systems and organizations
3. Developing leadership that balances getting input and making decisions, so work moves ahead

Virtual teams also need to spend time together to build good working relationships, so periodic face-to-face meetings are helpful.²⁶

Team roles
Many responsibilities need to be carried out cohesively for a team to be successful. Dr. Jack Silversin broke these responsibilities down into the following three roles for the project team:

- **Sponsors**: The formal leaders and prime movers of the project
- **Change Agents**: The helpers, facilitators, and content experts for the project
- **Champions**: The respected opinion leaders who provide credibility to the project²⁷

The success of the team depends on the ability of each person to fulfill his or her respective duty, as well as on the group's ability to work together as a cohesive unit. An effective leader needs dedicated team members. Team members need credibility and expertise. Each member brings something to the table and is equally important to the project's success.

Sponsors
Sponsors hold others accountable to get on with change. The sponsor inspires the team members to say, “I believe in this project.” Some project tasks may require sponsors at multiple levels in order to obtain adequate resources and buy-in from the entire project team.

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²⁷ Silversin, Jack, DMD, DrPH. *The Tipping Point & Organizational Change*. PowerPoint presentation to VHA employees.
Case Study:

Sponsors for the Advanced Clinic Access (ACA) initiative (a VHA effort focused on improving access to care for Veterans) are passionate role models who help build public support for the effort. They use their authority to deploy resources and hold those resources accountable for their actions. Additionally, they help develop policies that made ACA the "easy way." Sponsors include service chiefs, managers, and front-line supervisors.

Change agents

While the change agents have no formal authority over other team members, they are instrumental in implementing the change through planning, helping, and facilitating. As these change agents are the technical experts on the team, they influence progress by gathering measurable data and information. They listen to the concerns of other team members and help remove barriers. They support the sponsors to do what only they can do.

Champions

The champions are respected clinicians or staff who have influence through clinical reputation or leadership qualities. Through their experience, they provide credibility for the project team and task. They support the change and work for its implementation by speaking favorably about it, sharing their first-hand knowledge or experience.

Project team composition

While project team composition will vary, depending on the type of team being built, in most cases the project team will include the front-line staff (i.e., nurses, physicians, clerks, ancillary services staff) and area supervisors directly affected by the project task. To identify these personnel, consider all relevant stakeholders to the process. The ideal team size is 8-12 people. Team size should not exceed 15 people unless absolutely necessary. The project team will benefit from including an administrative leader who has the authority to support implementation of changes. The team should also include individuals who can provide performance improvement technical support. For those stakeholders who are not represented, develop a communication mechanism (team minutes, session report) and designate one or more people to disseminate this information regularly.

The process owner is the team member who will be responsible and accountable for sustaining improvements during and following implementation. Ideally, the process owner should be someone with authority over front-line staff directly involved in the process evaluation.

Chosen team members must be able to commit to attend team meetings and meet their responsibilities.28

Teaming Tool: Project Charter29

A team charter describes the boundaries, expected results, and resources to be used by a process improvement team. The individual or group who formed the team usually provides the charter. Sometimes the process owner or the team members develop a charter. A charter is always required for a team working on a process that crosses departmental lines. A charter may not be necessary for a team that is improving a process found solely within a work center, or office space. A charter identifies the following:

- The project background, including problem and goal statements

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The project scope, including process start and stop, and identification of items not within consideration for the project

The project deliverables, including specific end results expected from the project, and a definition of how change will be validated following improvements

The charter represents a ‘binding contract’ between the project team with respect to project direction and outcomes. A sample project charter template is provided in Figure 2. It is often used as a reference document by the project team during project execution. The project charter ensures:

- That project expectations, including scope and deliverables, are clearly identified prior to project initiation.
- Continuity of the project throughout the project cycle

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<table>
<thead>
<tr>
<th>Project Name:</th>
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<tbody>
<tr>
<td>Date Chartered</td>
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<tr>
<td>Project Team</td>
</tr>
<tr>
<td>Process Owner</td>
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</table>

**Problem Statement**

- Describe the problem, opportunity, or objective in concise, measurable terms.
- Include a summary of the problem and impact (a.k.a. PAIN).

**Goal Statement**

- Describe the team’s improvement objective
- Begin with the words “reduce, eliminate, control”
- Include ‘SMART’ factors: specific, measurable, attainable, relevant, timebound

**Project Scope**

- Where does the process under investigation start?
- Where does this process stop?
- What is inside of the project scope?
- What is outside of the project scope?

**Deliverables**

- What end result(s) do you expect to achieve from this project?
- How will you know that any changes have resulted in improvements?

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Stages of Team Formation

Some team members may instinctively understand their role and how teams evolve. Others may be surprised when a team does not initially function in an effective and collaborative manner. Teams may get off to a "rocky" start, but ultimately the members adapt and learn to work together effectively. One description of this change in team behavior is the Tuckman model of team formation. This model describes how a team tackles a task from the initial formation of the team through the completion of the project. These four stages consist of Forming, Storming, Norming, and Performing, as outlined below:

1. **Forming** represents the teambuilding phase immediately following introduction of the team members. During this time, team members are transitioning from individuals to team members.
   - **Team Characteristics:** reserved, awkward silences, overly polite, excited, anxious
   - **Typical Behaviors:** Members speak as individuals, hesitate to participate

2. **Storming** is often the most difficult stage of team formation. During this phase, team members are assessing boundaries and roles within the team. They realize that tasks may be difficult or different from what they expected.
   - **Team Characteristics:** team members resist collaboration and participation, because they are frustrated with the lack of progress
   - **Typical Behaviors:** arguing, competition, disregard of ground rules, increase in hindering behaviors

3. **Norming** is the phase where team members begin to accept each other and the team goals.
   - **Team Characteristics:** enthusiasm is high, relationships become more cooperative, a sense of trust and team cohesion builds
   - **Typical Behaviors:** increased focus on group norms and team relationship behaviors

4. **Performing** is the final stage in team formation, where the greatest amount of work is accomplished. During this phase, the team has settled down and has become a cohesive unit. Additionally, the team has worked through personal and relationship issues and can concentrate on the team performance goals.
   - **Team Characteristics:** members understand and accept their place within the team environment
   - **Team Behaviors:** members are willing to make individual sacrifices, and are open to disagreement

Clinical Microsystems (CM)

A CM is the place where patients, families, care teams, and information come together. This is where quality, safety, outcomes, patient satisfaction, and staff morale are created. A CM is a small group of people who work together on a regular basis to provide care together with the subpopulation of patients (and family) that receive that care. A CM has specific clinical and administrative aims, linked processes, and shared information. It produces a service (care that can be measured) and is part of a larger macrosystem. CMs are the basic building blocks of

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healthcare. Examples of a CM include an individual primary care team (embedded in a larger system), the emergency department, or a discrete inpatient unit.

Within a CM, employees learn how to become competent professionals and how to keep improving over time. A CM serves as a laboratory to test changes in the care delivery system. A flourishing CM is the place where pride in work happens. Thus, VHA has chosen to have process improvement work done in teams. An ideal team (part of a CM) has the following characteristics:

- Team members regard each other as peers
- Teams are empowered to make changes
- Teams have data about the outcomes of their work
- Teams operate with a Continuous Improvement Process framework such as the PDSA framework (refer to Chapter 6, Change, for further information about PDSAs)
- Teams have time set aside to regularly do PDSA cycles
- Teams work collaboratively

Successful teams learn about the distinct system redesign methodologies and how to follow instructions. The team will do their own measurement, measure their progress frequently, plot their outcomes, and post their results in their CM. From the “Theory of Constraint”33 we have learned that all staff need to have a “forum” or platform in their CM, where they can discuss problems and suggest innovative changes. Process improvement cannot be mandated by senior management; improvement occurs through teams working within their CM.

**The Three "Cs": Content, Context, and Community**

Successful change initiatives enable teams and stakeholders to make sense of the issues, problems, and opportunities. They create a shared understanding of the potential solutions, come to agreement on the most viable solution, promote acceptance and buy-in to decisions, and help ensure that new ways of working are incorporated into the sustained attitudes and behaviors of employees. This outcome is often attributed to a clear idea of how to successfully "manage" change. A change management approach during the teeming stage will provide VA teams with a practical process for planning and conducting change initiatives (e.g., performance improvement, problem solving, and change implementation) at the workplace level. The change management approach aims to provide VA teams with the knowledge, capability, and empowerment necessary to create practical solutions to local problems.

As shown in Figure 3, VA’s change management approach involves three important elements: **Content** (the idea, solution, or innovation being introduced to the workplace), **Context** (the social, organizational, and technological environment considerations for developing solutions or

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33 Theory of Constraints (TOC) is an overall management philosophy related to process improvement introduced by Dr. Eliyahu M. Goldratt in his 1984 book titled The Goal, that is geared to help organizations continually achieve their goal.
implementing the change) and Community (those affected by or who can affect the success of the change) for which the change initiative will be introduced.

**Content**
Content refers to the activity, problem, or decision that requires change management. Content can reflect any aspect of changing VA operations. VHA's four-phased process improvement and problem solving approach, shown in Figure 4, depicts the steps that a team should employ to:

- Assess a particular problem or issue and improvement opportunities
- Develop the to-be solution and action plans for implementation
- Implement change through employee training and migration to the new way of working
- Sustain by monitoring and assessing performance results

![Figure 4: VHA's Four-Phased Approach to Process Improvement.](image)

**Context**
Context refers to the social, organizational, and technological environment considerations when making a decision or implementing a change. These factors may represent enablers or constraints on the design of a practical solution. This element can be considered through a lens incorporating three dimensions, as shown in Figure 5:

- The Organizational dimension takes VA's core characteristics into account, such as mission and strategic direction, organizational structure, roles and responsibilities, major processes, policies and procedures, rules and regulations, and technology environment. This dimension also takes into account any operational considerations that will influence the development of solutions or implementation plans for a change initiative.

- The Behavioral dimension takes into account the social influences on employee behavior. The social influences of an employee's workgroup can reinforce or counter new ways of working. These social influences can be observed, modeled, and imitated through the behaviors and attitudes of members of an employee's workgroup. If these are consistent with the new way of working, the desired change in work practices will likely be sustained. If these are inconsistent, the new behavior will diminish over time.

- The Tone at the Top dimension examines the leadership team at the top of the organization as change champions (refer to section on Team Roles earlier in this chapter) and models for the new way or working. Viewing change through this lens, teams should clearly understand the important role that leaders play in defining and communicating the change vision, inspiring others, driving action and accountability, and serving as a visible role model for the change.

![Figure 5: VHA's Three Dimensions for Building Context.](image)

**Community**
Community refers to those stakeholders impacted by the change, or who can affect the successful implementation of the change, either through control of resources or decision making. Consider each change initiative through the lens of the stakeholders who can determine the success or failure of the initiative. Stakeholders will, in general, share some common goals. But they will also bring specific objectives, interests, and perspectives to the project. The team must understand these shared and sometimes different or competing interests.

Shared and competing interests may impact the success of the change initiative. How can your team best develop the buy-in and commitment of the stakeholders to the change initiative? Through a process of inquiry (e.g., interviews, focus groups, surveys), you can learn about the unique perspectives of each stakeholder group. Through a collaborative process (e.g., retreat), the team can seek to build agreement, buy-in, and commitment of the stakeholders to the change initiative. Even if the team does not achieve complete buy-in and agreement to the new way of working, the act of involving the stakeholders in the change process will likely create a solution that each stakeholder can "live with and support."

**Aim**

An “Aim” is a written, measurable, time-sensitive statement of the expected results of a systems redesign process. An aim tells us what we are trying to accomplish. Because VHA’s purpose is to reduce the burden of illness and improve health status and function, we must decide what parts of our health care system to improve. Another way of looking at an aim is to make it personal to the team—stated in words that are meaningful to your team and larger system:

- What does the team intend to accomplish?
- What is the timeframe for this change to take place?
- What part(s) of the system will be improved?
- What are our specific, numerical goals?
- What is the overall direction of our improvement?

Both senior leaders and front-line staff must participate in establishing aims. Senior leaders assure that the aims are aggressive and align with the strategic goals of the organization. Front-line staff will feel challenged by aim statements, yet feel that they are achievable. Both senior leaders and staff must agree on the aim in order to achieve optimal results.

**Make the Aim Effective, Clear, and Measurable**

Improvement requires setting aims. An organization will not improve without a clear and firm intention to do so. Express the aim in specific, measurable terms. For example, "Reduce waits for colonoscopy procedures from 30 to 15 days."

"Improve percent of primary-care patients screened with FOBT to 98%." Your team must agree on the aim and allocate the necessary people and resources to accomplish it.

For each issue, specify a corresponding improvement goal, describing in general terms what change the team hopes to see after its work is completed. A goal describes the desired outcome, indicating both a direction of change (increase or decrease in numbers or time) and a way of measuring that change (e.g., counts or percentages). This general statement will be further refined in later steps, as the team develops a better understanding of the systems issues.

A common mistake is to state the improvement goal in terms of what are actually intermediate goals or improvement processes, instead of true outcomes. For instance, stating the improvement aim as “All patients will receive education about advance directives,” actually
identifies a process to bring about change (training or education), not a specific outcome. It states what activity will be undertaken, but not what the activity is expected to accomplish. A better aim is, “Patients will communicate specific treatment preferences,” or “Patients will be knowledgeable about advance directives.”

The team must specify a preliminary improvement goal for three reasons:

- First, it requires the team to clarify the meaning of ill-defined concepts or ambiguous terms and helps to ensure that everyone is talking about the same aspect of the systems issue in question.
- Second, if the issue was initially defined too broadly, stating a specific improvement goal will help the team focus more narrowly and define the issue in more manageable and measurable terms.
- Finally, specifying a concrete goal will help to ensure that the team operates in an efficient, practical, problem-solving mode.34

To create an effective aim statement, follow these principles:

- **State the aim clearly:** Achieve agreement on the specific aim of a project and state the aim very clearly. Provide a measured aim. Be brief; a single sentence is best.
- **Base your aim on data:** Examine your medical center’s data: delays into, through, and out of the unit; flow issues or bottlenecks; and patient, staff, provider satisfaction. Focus on issues that matter to your patients and to all members of the unit.
- **Include numerical goals:** Numerical goals clarify expectations. For example, “Reduce the delay from ordering of x-ray test to final report from 2 days to 1 day by July 1st, 2012.” Numerical goals clarify the aim, direct the measures of improvement, and focus initial changes.
- **Set stretch goals:** Setting stretch goals immediately tells people that the status quo is not an option. For example, “Assure superior satisfaction for at least 95% of patients.” Make these stretch goals aggressive, but make sure these goals are possible. You do not want to demoralize the project team by "reaching for the sky." One way to avoid this is to set additional intermediate, more practical goals, building up to the stretch goal, which serves to reinforce the stretch goal.
- **Avoid aim drift:** Once the aim has been set, be careful not to back away from it. An initial stretch goal, “Reduce waiting time for colonoscopy to 15 days by December 1, 2012” can slip almost imperceptibly to “Reduce waiting time to 30 days by December 1, 2012.” To avoid aim drift, repeat the aim as often as deemed necessary for the particular type of team. For example, periodically begin formal team meetings with the aim statement: “Remember, we are here to reduce waiting time for colonoscopy to 15 days by December 1, 2012,” and then review progress quantitatively over time.35

5. Map and Measure

The VA-TAMMCS framework poses the following two map and measure questions:

- **Have you drawn a picture (map) of the process?**
- **How do you know if a change represents improvement?**

The **mapping** question highlights the importance of the flow-mapping process. Flow mapping serves to identify a process clearly by clarifying the start, end, and key decision points. It allows the teams to agree on the existing process. In addition, the experience of flow mapping itself leads to realizations about how complex many processes are, how non-standard and unreliable they can be, and how much re-work is involved. Flow mapping can also lead to ideas for measuring and improving the process in question.

The **measure** question enforces the need for measuring. How will you know if the changes your team makes are really an improvement and fulfill your obligation to manage by fact not feel? Measurement in the improvement world is intended to be measurement that is "good enough" so that the team knows whether it is meeting its aim. You do not necessarily need "perfect" measurement as, for instance, would be required for a scientific research study. Your team should not spend all of its time on measurement, but use measurement to both "diagnose" the current state, including the constraints, and to "see" the general direction of change. Measurement done well will contribute to team learning and minimize individual lobbying for any one point of view.

Over the course of this chapter, we will help define what these two terms mean. We will provide several tools and techniques for both mapping a process and measuring its outcomes.

**Map**

**Mapping Tool: Supplier, Input, Process, Output, Customer (SIPOC)**

SIPOC, as shown in Figure 6, is a process-oriented tool to begin mapping and understanding any process. It pieces together the major elements of a process/value stream to allow participants the ability to view it at a high-level and agree on it. The term “SIPOC” consists of the first letter of the five major pieces in a process, consisting of:

- **Suppliers** to the process. Who or what provides information, materials, or service?
- **Inputs** provided by the suppliers. What actual information, materials, or service do they provide?
- **Process** steps. What are the main steps of the process? What actions taken upon the inputs yield output and add value?
• **Outputs** for the customer. What final product or service results from the process?

• **Customers** of the process. Which person, process, or organization receives the output?

After you have identified every element of the SIPOC, you can identify the starting point and the stopping point of the process. This sets boundaries and limitations, so the scope is clearly defined for the team. It allows the team to see the big picture. If you cannot identify all the elements of the SIPOC, you may lack a clearly-defined process. Review it again.

The process of completing a SIPOC starts with a general description of the scope of the initiative from the leader, process owner, or subject matter expert. The next steps are to identify 1) the customer(s) of the process, 2) the outputs or final products to the customer(s), and 3) the high-level steps to the process. The optimum is 5-10 steps. The process must have a clearly identified “start” and “stop” point. The next steps will identify the suppliers and inputs to the process and then document the conclusions of this tool for later reference.

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**Mapping Tool: Analyzing and Mapping the Value Stream**

A Management Guidance Team may use value stream mapping techniques to strategically prioritize improvement, based on the high-level constraints within the process(es) under investigation. The team often conducts value stream analysis during an annual or bi-annual strategic planning (refer to the Chapter 3, Vision and Analysis, for more information about Management Guidance Teams). The value stream is defined as all of the processing steps necessary to satisfy the customer requirements for a specific process. The Management
Guidance Team may use current- and future-state value stream maps to develop implementation plans leading from the current to future state.  

Steps to analyze a value stream:
1. Develop the current-state value stream map.
2. Apply basic measurement tools to collect high-level process timeliness, quality, and reliability data.
3. Identify high-level process constraints within the current-state value stream.
4. Utilize advanced measurement and process mapping tools to ‘drill down’ into the high-level processing constraints.
5. Using PDSA cycles, test the application of Lean Tools to reduce or mitigate the process constraints and improve process reliability.
6. Develop and utilize an implementation plan to improve processes.
7. Go back to step #3 to address additional high-level process constraints, with the goal of moving the value stream from current to future state.

Map the value stream
A value stream map visually represents the current state of the process. The value stream map includes information about processing steps, processing times, wait times, and number of items within the process. Information and material flow may be added to provide a complete snapshot of the process.

To draw a value stream map, you need to have a value stream. This includes all of the activities, both value added and value lost, which are required to begin the process and move through the process to the end point. For example, bring a patient from "decision to admit" through "discharge from acute care." Steps to create a value stream map include:
1. Flow chart the Process at a very high level (5-7 processing steps).
2. Add suppliers and customers.
3. Map the information flow.
4. Map the material flow.
5. Utilize basic data collection tools to collect and add information about process times, wait times, and queues.

After mapping the existing process, build a map of the ideal process for patient flow at your facility. This will begin the brainstorming towards rapid-cycle changes that can improve the overall quality of care and throughput.

A value stream map uses common symbols, as shown in Figure 7.

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The following key provides definitions for these symbols:

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process Box</td>
<td>Box used to display process name</td>
</tr>
<tr>
<td>Data Box</td>
<td>Box used to display process step specific information</td>
</tr>
<tr>
<td>Physician</td>
<td>Icon used to display the physician as a customer and/or supplier</td>
</tr>
<tr>
<td>Hospital</td>
<td>Icon used to display the hospital as a customer and/or supplier</td>
</tr>
<tr>
<td>Information/Computer System</td>
<td>Icon used to display process steps related information flow and/or data entry into a computer system</td>
</tr>
<tr>
<td>Queue/Inventory</td>
<td>Symbol used to identify delays in processing and/or excess inventory</td>
</tr>
</tbody>
</table>

**Mapping Tool: Critical Path Method (CPM)**

CPM visually models the activities and events of a project as a network. Activities are depicted as nodes on the network, and events that signify the beginning or ending of activities are depicted as arcs or lines between the nodes. CPM provides the following benefits:

- Provides a graphical view of the project
- Predicts the time required to complete the project
- Illustrates the precedence and interrelations of each activity
- Shows which activities are critical to maintaining the schedule, and which are not

To create a CPM network diagram, you must complete each of the steps below:

1. Specify the individual activities
2. Determine the sequence of the activities
3. Draw the network diagram
4. Estimate activity completion time
5. Identify the critical path
6. Update CPM diagram as necessary

An example of a CPM network diagram:
The critical path can be identified by determining the following four parameters for each activity:

- **ES**: Earliest start time: the earliest time at which the activity can start, given that its precedent activities must be completed first.
- **EF**: Earliest finish time: the earliest time at which the activity can be completed based on the earliest start time plus the time required to complete all the necessary steps.
- **LF**: Latest finish time: the latest time at which the activity can be completed without delaying the project.
- **LS**: Latest start time: latest time at which the activity can start and allow the activity to finish, without delaying the project.

The *slack time* for an activity is the time between its earliest and latest start time, or between its earliest and latest finish time. Slack is the amount of time that an activity can be delayed past its earliest start or earliest finish without delaying the project.

The critical path is the path through the project network in which none of the activities have slack. That is, the path for which ES=LS and EF=LF for all activities in the path. Any delay in the critical path delays the project. Similarly, to accelerate the project, you must reduce the total time required for the activities in the critical path.

CPM was developed for complex but fairly routine projects, with minimal uncertainty in the project completion times. For less routine projects, there is more uncertainty in the completion times. This uncertainty limits the usefulness of the deterministic CPM model.\(^{41}\)

### Mapping Tool: Process Flow Diagram

Begin your process flow diagram by illustrating how the process works in the local setting. Gather information from key sources to develop a detailed understanding of the process behind the relevant practice. Understand how the process actually works. This will help the team clarify the scope of the issue, identify potential leverage points for change, and generate ideas for measuring improvement.

Process flow diagrams are inputs for other tools, including cause-and-effect matrices, fishbone diagrams (Ishikawa diagrams), failure mode and effect analyses (FMEAs), and control plans. Therefore, process flow diagrams must be detailed (at an actionable level), complete, and accurate (up-to-date, latest revision).

The ideal team members to work on process flow diagrams should be the process owners (those who inherit the results of the project), technical staff who know the process, product, design, equipment, and operations staff (e.g., clerical, maintenance, health professionals).

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shift supervisors, trainers, and lead personnel).

The team can employ a variety of methods to develop the process-flow diagrams, including brainstorming, observation/experience, manuals, handbooks, SOPs, engineering specifications, and work directions.

Most processes are complex, and the different people involved may perceive the process very differently. Stakeholders who are affected by a process may see it very differently from individuals who participate in carrying it out. Oftentimes, these latter individuals are only familiar with aspects that directly involve their work and lack a comprehensive sense of the process. Therefore, except for very simple processes, you need multiple sources of information to ensure that the description of the process is accurate and complete.

The process flow diagram will help identify loops (potential bottlenecks), serial and parallel process steps, internal supplier and customer relationships, and inputs and outputs for each process activity.

**Validate** the process flow diagram. What is documented on paper may not always reflect reality. Always walk through the process and ensure what was documented on paper is what is actually occurring. Ensure the process flow diagrams include all inspection, measurement, and transportation steps. Show the controlling documents for each process step. The standard symbols for process flow diagrams, as shown in Figure 9, make it easy for others to follow the process:

![Diagram Symbols](image)

**Figure 9: Standard Symbols for Process Flow Diagrams.**

Diagramming a complex process accurately and efficiently may require one or more meetings where “process experts” are all in the same room together. Although this may seem time-consuming, in the end it is the most reliable method of developing a process flow chart. Whenever possible, collect information about a given process firsthand from the people who are most directly involved. Alternative methods for gathering information include conducting group discussions (or even focus groups), directly observing the practice, and talking to individuals one on one. Ideally, you should include individuals with direct knowledge and experience of the process under study as team members or as ad hoc members of the workgroup.  

**Mapping Tool: Brainstorming**

Sometimes the most innovative and effective ways of dealing with a problem come to mind when people just toss out ideas—in other words, when they brainstorm. Effective, open-ended brainstorming actively engages all members of a workgroup. This is especially important for engaging individuals who have significant “on the ground experience,” but who are rarely asked to contribute their opinions to systems improvement efforts.

Effective brainstorming follows a few basic rules:

1. The session leader clearly states the purpose of the brainstorming session.
2. Participants call out one idea at a time, either going around the round in turn, which structures participation from everyone, or at random, which may favor greater creativity.

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Another option is to begin the brainstorming session by going in turn and after a few rounds open it up to all to call out ideas as they occur.

3. Refrain from discussing, complimenting, or criticizing ideas as they are presented. Consider every idea to be a good one. The quantity of ideas is what matters; evaluation of the ideas and their relative merit comes later. Get as many ideas generated in a short period of time as possible. Discussing ideas may lead to premature judgment and slow down the process.

4. Record all ideas on a flipchart, or on self-adhesive notes so that all group members can see them.

5. Build on and expand the ideas of other group members. Encourage creative thinking.

6. Remain open to a wide range of possibilities and strive to think outside the box, going beyond familiar strategies.

7. When generating ideas in turn, let participants pass if an idea does not come to mind quickly.

8. Keep going when the ideas slow down in order to create as long a list as possible and reach for less obvious ideas.

9. After all ideas are listed, clarify each one and eliminate exact duplicates.

10. Resist the temptation to “lump” or group ideas. Combining similar ideas can come later.  

After the brainstorming session is over, sort through the new ideas as a team. Critique, refine, and reorganize them, to produce a list of change strategies. For additional information on brainstorming, refer to "Preventive Ethics: Addressing Ethics Quality Gaps on a Systems Level," produced by the National Center for Ethics in Health Care (available online at www.ethics.va.gov/IntegratedEthics).

**Mapping Tool: Fishbone Diagram**

The fishbone diagram, as shown in Figures 10-12, is a method of systematically organizing all of the potential causes that may be contributing to a problem (effect). It is particularly effective right after a brainstorming session. This process is done by first stating the problem; place it in a box on the right side (the fish’s head). Next, draw a horizontal arrow to the problem box and begin writing the traditional main categories of factors or suspected categories above and below the line. Connect them to the main line. Within each of the main categories, brainstorm and list all of the detailed factors that may be causing the problem. Further refine the categories by listing all of the inputs in each of the detailed factors. The following diagrams illustrate an unlabeled fishbone structure and two alternative ways of categorizing the factors affecting a process. You should feel free to use whichever one appeals to your team.

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Mapping Tool: Modeling

Modeling allows you to consider changes in a system, current or planned, under different situations to optimize the outcome. Models can be simple mathematical models, but more complex models can provide a more realistic picture of the system you are studying.

Greater complexity allows the model to better reflect the changes that might occur in the real system. Greater complexity likely will require more time to construct the computerized dynamic simulation model. Keep in mind that these models will have no value if the correct data are not
put into the system, such as the actual length of stay on a given unit in the hospital. This will require an understanding beyond the averages, such as average length of stay, to an understanding of the appearance of the distribution of those values, including likely minimum and maximum values. Complex models may have multiple interacting subsystems, each with their own distributions of various values.

Dynamic simulation modeling can be used to assess potential changes in the system of interest. It allows for variations in many different inputs. The complexity is limited by the time of the model developer and the availability of the data. Once built, changes can easily be made and assessed. Just as results of real-world changes may be unexpected and counter-intuitive, the results from modeling may be surprising. However, the results from simulation modeling “experiments” can be reviewed before committing money for design and construction and without placing any patients at risk for adverse outcomes.45

As modeling can be a complex process, refer to "Patient Flow Handbook" for a more robust and in-depth description of proper modeling techniques.

Mapping Tool: Spaghetti Diagrams
The spaghetti diagram examines the physical path that a patient takes through a treatment area, or the path that a health care worker takes, as they perform tasks associated with patient care. The term ‘spaghetti’ is used, because these diagrams often begin to look like spaghetti noodles as process flow is recorded.

These charts provide a graphical depiction of physical movement, enabling identification of inefficient workspace, area layout, or both. A comprehensive understanding of the physical work flow allows the project team to identify problem areas, including waste caused by inefficient movement and patient, information, or supply transportation.46 To create a spaghetti diagram, follow these steps:

1. Find or create a diagram of the workspace.
2. Note the physical location of the worker or patient at the beginning of the process.
3. Observe the process, drawing lines that follow the path that the worker or patient takes as they complete the processing steps.
4. Lines may be numbered to reflect the steps on the process map.

Your team will need qualitative measures to determine if a specific change actually leads to an improvement. For example, is access to colonoscopy improving? Is screening for colorectal cancer getting better? In addition, your team needs to make sure that changes designed to improve one part of the system are not causing new problems in other parts of the system. For example, a team working to improve access needs to make sure that patient waits in the clinic (visit cycle time) is not getting worse, and patient satisfaction is not declining.

Measure
Tips for Effective Measurement
Measurement should be used to speed improvement, not slow it down. Often, organizations get bogged down in measurement and delay making a change until they have collected enough data. The following is a list of useful tips for effective measurement

1. **Data Sources:** Because VA has a culture of measurement, many data sources may be available to inform a process. Remember, before relying on any measurement, you need a clear understanding of data definitions, data sources, and process. In addition to existing data, teams often find it necessary and useful to collect data locally on a given process.

2. **Timeliness:** Given that the underlying dynamics of demand, supply, and activity are responsible for the overall timeliness of any process, teams will find an examination of those elements helpful. Teams will also be interested in balancing measures, such as no-shows, rework, continuity, and panel size (or case load) in clinical care. Satisfaction improves as the underlying processes improve. Therefore, patient satisfaction must be measured over the long term.

3. **Reliability:** When your team chooses to improve the reliability of a system as its aim, you will need to establish a baseline of current performance using existing performance measures and databases.

4. **Level of detail:** Measure everything at the front-line, or team level, where the process can be affected. This allows each team to know the effect of their process execution. Individual or team data can then be rolled up into sections, departments, services, or facilities, as desired.47

5. **Seek usefulness, not perfection:** Remember, measurement is not the goal; improvement is the goal. In order to move forward to the next step, your team needs just enough data to know whether changes are leading to improvement.

6. **Use sampling:** Sampling is a simple, efficient way to help your team understand how a system is performing. In cardiac surgery, the patient volume is typically low enough to allow tracking of key measures on all patients. However, when there are too many events to examine, sampling can save time and resources, while accurately tracking performance. For example, instead of monitoring the visit cycle time continuously, measure a random sample of 5 to 10 patients per month.

7. **Integrate measurement into the daily routine:** Useful data are often easy to obtain without relying on information systems. Avoid waiting two months to receive patient satisfaction data from the Austin Automation Center. Develop a simple data collection form and make collecting the data part of someone’s job. Often, a few simple measures will yield all the information you need.

8. **Use qualitative and quantitative data:** In addition to collecting quantitative data, be sure to collect qualitative data, which often are easier to access and highly informative. For example, ask the clerical staff how the messaging system is working. Or, in order to focus your efforts on improving Veterans’ access, ask patients about their experience of getting a timely appointment.48

**Measuring Tool: Gather Data**

The project team needs to collect specific data about current practices to establish a baseline against which to compare the results of future improvement efforts. Note that the project team must collect its own data. Data about current practices will help your team answer the question, “What are we doing now, relative to what we should be doing?” The team will “think outside the box,” but it does not need complicated measures, demanding data collection efforts, or sample sizes that would yield statistically significant conclusions. In fact, they can measure practices

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simply by comparing the number of occurrences of a particular practice before and after an improvement strategy has been implemented.

Data to measure baseline practice can come from a variety of sources, such as:

- **Key informant interviews**, which can be done quickly and provide general baseline data. For example, if the issue is that pharmaceutical representatives are unduly influencing formulary decisions, you could ask formulary committee members questions based on their personal experiences.

- **Focus groups**, which are harder to do properly, can be valuable for obtaining comments on an issue from multiple stakeholders. For example, a focus group might provide insights into how leaders make resource allocation decisions.

- **Existing facility databases**, such as financial performance indicators, Healthcare Effectiveness Data and Information Set (HEDIS) measures, employee surveys, patient surveys, or other quality improvement initiatives. One such example of a facility database is the LINKS database and dashboard. Hospital leaders in the VA are expected to track outcomes and processes of more than 200 quality measures, results from the VA Inpatient Evaluation Center (these reports may be more than 200 pages each), surgical outcomes, and measures of organizational performance from the National Center for Organizational Development. Each series is generally held in a separate location. The LINKS dashboard consolidates bits of critical data from multiple sources. By using automation to identify significant data, the dashboard provides more management time for the crucial human analysis.

- **Surveys**, which are difficult and time consuming to develop and require specific survey design expertise. Your team should strongly consider using existing validated instruments, rather than designing its own surveys.

- Other data sources suggested by local quality management staff.49

While data may be appear to be readily available from multiple sources, be sure to consult with appropriate stakeholders before using the data.

**Measuring Tool: Run Chart**

Improvement requires change, which occurs over time. Much of the information about a system and how to improve it can be obtained by plotting data (e.g., delays, cycle times, patient satisfaction) over time and observing trends and other patterns. That is why an annotated time series is a useful standard for displaying data.50 Run charts, as shown in Figure 13, display process performance over time. Your team can observe upward and downward trends, cycles, and large aberrations and investigate them further. In a run chart, events, shown on the y-axis, are graphed against a time period, on the x-axis.

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50 Veterans Health Administration. Flow Improvement Inpatient Initiative (FIX) FY09: Bedside Care Collaborative, January, 2009.
Figure 13: Run Chart Measuring Tool.

Measuring Tool: Variability Analysis
All Healthcare systems are subject to three major stresses:

1. **Flow stress**: The variation in the request or arrival rate of patients presenting for hospital care
2. **Clinical stress**: The variability in type and severity of disease
3. **Professional stress**: The variability in the professional abilities and competing responsibilities of health care providers, such as teaching medical and nursing students, while at the same time caring for patients.

The variability associated with these stresses routinely produces peaks and valleys (sometimes extreme) in the demand for hospital resources.

Just as an automobile not designed for rugged travel is unlikely to cross roadless terrain, if health care resources are inadequate to respond to Flow, Clinical, and Professional stresses, errors are likely to occur. System stress introduced by demands for nurses to care for more or sicker patients has clearly been shown to be a leading cause of adverse patient outcomes.

To date, the typical response to this situation has been to spend enough to provide the resources needed to handle peaks in resource demand and ignore the waste that results during the valleys. This solution is based on the notion that one cannot store the resources accumulated during the demand valley to use during the next peak. Mismatch between costly hospital resources and peaks in demand is thus a major source of reduced quality of care, nursing dissatisfaction, and reduced access to care.

Operations Research suggests that managing the variability by smoothing (lowering) the peaks and raising the valleys of variation in patient demand will reduce many of the stresses placed on the system (e.g., nursing and other staff).\(^{51}\)

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Measuring Tool: Checksheets
A checksheet is a worksheet template used to collect quantitative process output data, such as compliance and adherence data, or frequency of occurrence. Checksheets are used to:

1. Collect baseline performance data for the current state process
2. Collect performance data following the implementation to validate the impact of process changes

Standardize your team’s checksheets in order to build confidence in the data collection system and to ensure that data is collected in a reliable, repeatable way:

1. Select the output variable(s) to be measured and type of checklist to be used
2. Add columns to collect additional information in addition to the process output variable, such as dates, time, shift, and patient room
3. Add columns that may be used to indicate reasons for non-compliance/adherence (audit checklist) or process failure (operational barrier checklist)
4. Pilot test the form design and make changes as required

VHA uses two basic types of checksheets: audit checksheets and operational barrier checksheets.

Audit checksheets, as shown in Figure 14, are used to monitor compliance against protocols or policies during audits. Typically, these types of checksheets are filled out during an audit and represent compliance during a specified timeframe. Examples include the following:

- Number of patients receiving components of the ventilator-assisted pneumonia VAP prevention bundle during a 24-hour period
- Number of staff members performing hand hygiene prior to entering the patient room during a one-hour direct process observation

Example #1: Audit Checksheet

<table>
<thead>
<tr>
<th>Project Name:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Output metric:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Unit</th>
<th>Room #</th>
<th>Compliance against Hand Hygiene protocol (Y/N)</th>
<th>Reason if non-compliant</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/2007 10:00AM</td>
<td>ICU</td>
<td>405</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/1/2007 10:05AM</td>
<td>ICU</td>
<td>405</td>
<td>N</td>
<td>Alcohol dispenser empty</td>
<td></td>
</tr>
<tr>
<td>1/1/2007 10:10AM</td>
<td>ICU</td>
<td>405</td>
<td>N</td>
<td>Nurse carrying items</td>
<td></td>
</tr>
</tbody>
</table>

Figure 14: Sample Audit Checksheet.

Operational barrier checksheets, as shown in Figure 15, are used to collect data to determine how frequently operational barriers negatively impact the process. Typically, these types of checksheets are filled out over an extended period of time, by personnel directly involved in the process under investigation. Examples include the following:

- Type and frequency of delays in outpatient registration
- Type and frequency of equipment or supplies not in store room54

### Example #2: Operational Barrier Checksheet

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Patient Delay?</th>
<th>Delay Type</th>
<th>Patient Pre-reg’d?</th>
<th>Reason for delay</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1/2007 10:00AM</td>
<td>N</td>
<td></td>
<td>Y</td>
<td>Wrong billing info</td>
<td></td>
</tr>
<tr>
<td>1/1/2007 10:05AM</td>
<td>Y</td>
<td>DATA</td>
<td>N</td>
<td>Call-off, low staffing</td>
<td></td>
</tr>
<tr>
<td>1/1/2007 10:10AM</td>
<td>Y</td>
<td>ES</td>
<td>N</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reason codes:
- DATA: Data Error
- REG: Waiting on Registrar
- ES: Waiting on Escort

**Figure 15: Sample Operational Barrier Checksheet.**

### Measuring Tool: Process Observation Worksheet

A process observation worksheet, as shown in Figure 16, is used to collect data during direct process observation. Your team will number the processing steps from the process flow diagram and record them sequentially on a process observation worksheet template. During direct process observation, an observer will record the duration, wait time, and the length of the physical path to complete each step. Process Observation Worksheets are used to: quantify the duration and frequency of processing steps; and identify and quantify the impact of operational barriers on the process under investigation.

In order to create a process observation worksheet, follow these steps:

1. List the steps from the process map in sequential order. Steps following decision points may be listed as separate rows and numbered as sub-steps of decision point.
2. Observe the process and collect information on process step durations, wait times, and travel distances.
3. Perform multiple observations in order to determine the range of variation in processing steps and times.55

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Figure 16: Sample Process Observation Worksheet.

Figure 17 provides a key describing several of the terms used in the process observation worksheet.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>Travel distance in feet or steps</td>
</tr>
<tr>
<td>Clock Time</td>
<td>The elapsed time on a stop watch. This should be filled in to correspond to the time that each step is completed.</td>
</tr>
<tr>
<td>Task Time</td>
<td>The calculated time for each processing step. The task time is calculated by subtracting the clock time for the current step from the clock time for the previous step.</td>
</tr>
<tr>
<td>Wait Time</td>
<td>The amount of wait time present within each task time.</td>
</tr>
<tr>
<td>Observations</td>
<td>Comment on any observations with respect to the processing step.</td>
</tr>
</tbody>
</table>

Figure 17: Terms Used in the Process Observation Worksheet.

Measuring Tool: Voice of the Customer Analysis

The "Voice of the Customer" is a term used to describe the customer requirements for a specified process. Your team can analyze this utilizing a variety of "proactive" techniques, including direct discussion or interviews, surveys, and focus groups. Historically collected "reactive" data, such as complaints or comments cards can also be included.

The Voice of the Customer Analysis is a useful tool for:

- Understanding and validating customer requirements, expectations, and areas of dissatisfaction with the current processes
- Engagement of staff members involved in the process under investigation that are not part of the process team.

Example interview questions for Voice of the Customer Analysis include:

- What do you like about the current processes?
- What do you think needs improvement?
- What would you recommend to improve the current processes?
- What could potentially threaten the success of the project?56

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6. Change

All improvement requires making changes, but not all changes result in improvement. Teams must, therefore, identify the changes that are most likely to result in improvement. Ideas for change can come from a variety of sources: critical thinking about the current system, creative thinking, observing the process, a hunch, an idea from the scientific literature, or an insight gleaned from a completely different situation. The Change section of the VA-TAMMCS framework poses the following questions:

- What process change should be made to achieve the desired outcome (included in the aim statement)?
- When the change is implemented on a small scale, is the intended outcome realized?
- If not, what can be changed to achieve the intended outcome?

The key to successfully improving work processes is to test proposed changes on a small scale prior to large-scale implementation and then ensure that the work going forward is standardized. PDSA cycles are the primary tool of change within VA-TAMMCS. In the common vernacular, PDSA cycles can be thought of as, "I have a hunch, now let us see if it works." The velocity of improvement is directly related to the number of PDSA cycles undertaken by the team. As such, it is important to note that multiple PDSAs may occur at the same time.

Over the course of this chapter, we will help define PDSA cycles, discuss existing VA Collaboratives and Change Packages, and introduce additional tools that may help your project team entering the change phase of VA-TAMMCS.

**Plan-Do-Study-Act (PDSA) Cycles**

According to the Institute for Healthcare Improvement (IHI), changes should be tested on a small scale before large-scale implementation. Small-scale testing can be useful for confirming (or disproving) assumptions about the outcome of a selected change, and whether that change has the intended effect as outlined in the aim statement. Implementing untested changes can actually widen the gap between optimal performance and current practice. Thus, small-scale testing—making the change with one or two patients, or with one clinical team, or with a small sample of accounts receivable—ensures that the strategy avoids creating new problems, or making the original problem worse. The team will then monitor whether the strategy works and make adjustments to refine it into the most workable and effective solution possible. Once the decision is made to apply the change on a broader scale...

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across the organization, make sure to standardize the work. This will allow for members across
the organization to speak in the same language about processes and best practices.

PDSA cycles, as shown in Figure 18, are used to conduct small tests of change within current
processes. Your team will collect data following the test to verify improvements.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Steps</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Plan  | Plan the test or observation, including a plan for collecting data. | 1.) State the objective of the test.  
2.) Make predictions about what will happen and why.  
3.) Develop a plan to baseline the current process and test the change. (Who? What? When? Where? What data need to be collected?) | Describe Problem, make prediction. |
| Do    | Try out the test on a small scale. | 1.) Carry out the test.  
2.) Document problems and unexpected observations.  
3.) Begin analysis of the data. | Summarize Baseline Data |
| Study | Analyze the data and study the results. | 1.) Complete the analysis of the data.  
2.) Compare the data to your predictions.  
3.) Summarize and reflect on what was learned.  
   Adapt, Adopt, Abandon? | Enter Trial Information/Results |
| Act   | Refine the change, based on what was learned from the test. | 1.) Determine what modifications should be made.  
2.) Prepare a plan for the next test. | Summarize Results |

**Plan**
Once the team has identified the most promising change strategy for narrowing the gap
between current practices and best practices, your next step is to develop a specific plan for
how to carry out and evaluate the change and to execute the plan. First, the team must
determine what steps are needed to implement the change strategy and who should be
involved. In some cases, the core team might execute the plan itself. In others, it will need to put
together a special workgroup, or recruit additional individuals to perform specific tasks. Your
team must identify who needs to know about the plan to ensure that people are not blindsided
by changes being made in their area. When feasible, enlist the help of front-line staff, some of
whom may have already helped in prior stages of VA-TAMMCS. Also inform customers,
stakeholders, and process suppliers of planned change (or small tests of change) in order to be
aware of potential positive or negative effects that could occur within their own processes.

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Second, and equally important, the team must anticipate barriers to implementation and address them head on. For example, if a key staff member appears resistant to change, attempt to get the person’s buy in by engaging him or her in the improvement process. The biggest detractors can become the staunchest supporters when they are involved in implementing change. In the same way, identify ahead of time staff whose support is essential for successful implementation. For example, a change process that involves social work and nursing processes will be easier to advance, if social work and nursing leadership champion it by communicating support to their respective staff.

Include two types of measures in any plan for evaluating the change: measures to assess execution (whether the change was executed as planned) and measures to assess effectiveness (how well the change accomplished the improvement goal). For example, a team's aim was to enhance patients’ understanding of their right to access their health record, and the change strategy chosen was to provide educational materials to patients. This team assessed execution by counting the number of patient education brochures given out, and they assessed effectiveness by talking directly to patients to determine whether patients know that they can access their records and how to do so.

To execute the plan, the team will:

- Spell out each task in detail
- Assign each task to a specific person
- Establish explicit deadlines

Appoint someone from the team to oversee and monitor the execution of the plan. This person will follow up to ensure that tasks are being implemented. If the plan is not proceeding according to schedule, he or she will determine why, troubleshoot, offer advice, reassign tasks, convene a team meeting, or make other adjustments as necessary.

Also appoint someone from the team to monitor results in real time, as the plan is executed, in case mid-course changes are needed. Ideally, this person will have experience in collecting and analyzing data through the methods proposed, whether qualitative or quantitative. Regular monitoring will help to identify whether small adjustments to the change strategy need to be made, or whether implementation needs to be cut short because the intervention is resulting in unintended consequences. Depending on the nature of the project, your team may need to make mid-course corrections as you gain insight into what works and what does not. You will learn how to perfect the change to better achieve the intended improvement goal.61

Do
The "Do" component of PDSA is where the small-scale change is executed. This consists of carrying out the test, documenting problems and unexpected observations, and beginning analysis of the data.62 This step is vital in determining the impact of the change.

Study (or Evaluate)
After your team executes the change, you will evaluate the execution and results and follow up accordingly. Review all available information about the execution and results to determine whether the change should be made permanent and disseminated more broadly within the unit, service, or facility. Determine whether adjustments are needed in order to achieve intended aims. Consider these questions:

- Was the change executed as planned? If not, why not?

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In some cases, when a change does not achieve its intended results, it is not because the change strategy is faulty, but because execution has failed. For example, an important component of the change strategy may not have proceeded according to plan, because communication broke down, or a crucial member of the staff was on sick leave. In these cases, persist with the change until it can be executed according to the plan. Only then will the team be able to assess how effective it is in achieving the intended improvement.

In other cases, the change may have been executed according to plan, but it did not realize its intended outcome. For example, if the strategy was to change local policy relating to a particular practice, the change might have only a minor effect or no effect at all. And in some cases, even when a change is successful, it may have unintended secondary effects that make it unacceptable. A failed change strategy tested on a small scale is an acceptable result. It prevents large-scale failure. Failure is necessary for learning; therefore your team should not feel discouraged, if a tested change does not result in the desired outcome. The intent of PDSA cycles are to test and retest changes on a small scale, as shown in Figure 19, making necessary modifications until the desired outcomes are reached. Only at that time should changes be made and implemented across the enterprise.63

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Tips for Testing Changes

Stay a cycle ahead.
When designing a test, imagine at the start what the subsequent test or two might be, given various possible findings in the “Study” phase of the Plan-Do-Study-Act cycle. For example, if your team is redesigning same-day admission criteria, also plan how those criteria will be applied.

Scale down the scope of tests.
Dimensions of the tests that can be scaled down include the location, duration, number of patients, doctors, and others involved in the test. For example, “Sample the next 10,” instead of “Get a sample of 200.”

Pick willing volunteers.
Work with those who want to work with you. For example, “I know Dr. Jones will help us,” instead of “How can we convince Dr. Smith to buy in?”

Avoid the need for consensus, buy-in, or political solutions.
Save these for later stages. When possible, choose changes that do not require long processes of approval, especially during the early testing phase.

Do not reinvent the wheel.
Instead, replicate changes made elsewhere. For example, instead of creating your standing orders protocol from scratch, try modifying another facility’s protocol.

Pick easy changes to try.
Look for the concepts that seem most feasible and will have the greatest impact.

Avoid technical slowdowns.
Do not wait for the new computer to arrive; try paper and pencil instead.

Reflect on the results of every change.
After making a change, ask questions: What did we expect to happen? What did happen? Were there unintended consequences? What was the best thing about this change? The worst? What might we do next? Ask these questions even if the project failed. Your team may learn very important lessons from failed tests of change.

Be prepared to end the test of a change.
If the test shows that a change is not leading to improvement, end it. Note that Failed tests of change are a natural part of the improvement process. If your team experiences very few failed tests of change, it is probably not pushing the boundaries of innovation far enough.

Beware of resource-intensive change.
Changes that require additional employees (FTE), new equipment, and other resources are time consuming and often better saved for later stages of improvement work.

Consider sphere of influence vs. sphere of control.
When scoping tests of change, the best first changes are often those under the immediate control of the project team or lead.

Match the intensity of measurement with the magnitude of the change.
Over-measuring small tests can slow the process down and demoralize eager participants.

Figure 19: Tips for Testing Changes.64

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64 Veterans Health Administration. Patient Flow Handbook (Draft), August 3, 2006
**Act**

Depending on the results achieved, the team may decide to implement the process change more broadly, modify the original change strategy, conduct another test, or look at a different change to achieve the same improvement goal. If the strategy worked to successfully achieve the intended improvement outcome, the team should determine whether the improvement was sufficient to declare victory and move on. In general, if a small-scale test indicates that the change achieves the improvement goal or otherwise improves the process without causing adverse consequences in other parts of the system, implement the process change more broadly.65

**VHA Collaboratives and Change Packages**

A collaborative is a "structured framework within which teams learn about research and best practice, apply quality methods, and exchange their experiences of making improvements."66 The purpose of most collaboratives is "to close the gap between potential and actual performance by testing and implementing changes,"67 as well as providing a mechanism for "advancing the spread of improvement through a structured learning process."68 Collaboratives typically include the following features:

- Participation of a number of multi-professional teams with a commitment to improving services within a specific subject area and to sharing with others how they made their improvements
- A focused clinical or administrative subject—for example, reducing Caesarean sections, wait times and delays, or improving asthma care
- Evidence of large variations in care, or of gaps between best and current practice
- Participants learn from experts about the evidence for improvement, about change concepts and practical changes which have worked at other sites, and about quality improvement methods
- Participants use a change testing method to plan, implement, and evaluate many small changes in quick succession—for example, in the IHI model, the rapid-cycle improvement method, or PDSA
- Teams set measurable targets and collect data to track their performance
- Participants meet at least twice, usually more, for 1–3 days to learn the methods, report their changes and results, share experiences, and consider how to spread their innovations to other services
- Between meetings, participants continue to exchange ideas and collaborative organizers provide extra support, sometimes through visiting facilitators, email, and conference calls69

Participants in VHA change packages and collaboratives have learned some universal truths, described below:

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Advanced Clinic Access (ACA)
ACA is a VHA initiative focused on improving access to care for Veterans. The fundamental principle underlying ACA is that Veterans should have same-day access to healthcare services. ACA utilizes three main strategies for improving access: shape demand, match supply and demand, and redesign the service delivery system to increase supply. ACA shapes demand through working down the backlog of appointments, reducing demand for unnecessary clinic visits, and lengthening the time (when clinically appropriate) between return appointments. ACA matches supply and demand by reducing appointment types. Lastly, ACA redesigns the healthcare service delivery system by optimizing the care team and utilizing alternatives to office visits (e.g., provider phone calls replace superfluous follow-up visits).70

Flow Improvement Inpatient Initiative (FIX)
Dealing with hospital crowding is a widespread challenge. The healthcare industry is in the midst of a capacity and patient throughput crisis, which hinders efficient care and increases risks to patient safety throughout an organization. This has resulted in ineffective policies and procedures, poor utilization of resources, and patient dissatisfaction. The goal of VHA's FIX is to improve patient throughput and access to care, while improving or controlling quality of services. FIX seeks to optimize patient flow in order to eliminate delays, waste, and errors. With smooth “flow” of patients throughout their length of stay at the hospital, more patients can obtain quality care at the hospital over a given period of time.

Lessons Learned from FIX:
Case:
- A team in the FIX collaborative undertook to free up nurse and physician time by streamlining the process through which discharge appointments are made. After identifying that providers collectively spent up to 10 hours daily scheduling appointments, the institution elected to hire a discharge appointment clerk to centralize and standardize the work. Hiring and training took 9 months. After coming on staff, the clerk was able to identify several rapid changes in the clinics to accelerate the process and cut time to do the daily scheduling to less than 4 hours.

Lessons:
- Standardizing work and measuring its impact are solid improvement strategies. Was it necessary to make the first test of change, which took 9 months? Thoughtful process mapping, and the piloting of smaller, more numerous tests of change may have allowed this team to streamline their process in a much shorter timeline. Changes that require FTEs, or new equipment are time consuming and often better for later stages of improvement work.

FIX is designed to systematically analyze the barriers to the flow of patients through the continuum of care. This initiative is composed of health service teams that understand, analyze, implement, and measure processes that can smooth any unnecessary delay in the patient journey.71 VHA has undertaken the following projects related to FIX:

- Surgical flow collaboratives: Although not national-level collaboratives, several VISNs have launched single VISN (VISNs 3, 6, 11, 23) and Tri-VISN (VISNs 1, 7, and 19; VISNs 2, 8, and 12; VISNs 20, 21, and 22) Surgical Flow Improvement Collaboratives. The change package for these collaboratives focuses on identifying artificial variability (e.g., admissions to inpatient care and scheduled operating room (OR) utilization), improving pre-operative, intra-operative, and post-operative flow processes). They measure several key metrics, such as on-time starts, OR utilization, OR cancellations, and the impact of surgical flow on overall hospital flow.

• **Transitioning levels of care collaborative:** The initial phase of this collaborative focused on changes relating to the transition (movement) of patients from acute inpatient care to community living center (VA nursing home) level of care. They measured both the cycle time of the process as well as the completeness of the handoff and communications among the staff.

• **Patient flow coordination collaborative:** This collaborative builds upon previous collaboratives and initiatives on inpatient flow. It emphasizes the implementation and enhancement of flow improvement techniques from admission to discharge, while combining strong practices and technological tools that maximize efficient flow processes. Multi-disciplinary teams from 44 medical facilities participated. They learned how to:
  
  - Outline the principles and strategies necessary to improve patient flow
  - Describe methods to improve interdisciplinary communication and coordination
  - Describe the institutional groundwork necessary for the implementation of technological systems to track and streamline patient flow
  - Describe how the avoidable days data relates to flow; describe how patient safety and patient flow interact
  - Identify and analyze site-specific flow constraints or choke points in the patient-flow process and develop strategies to reduce the bottlenecks
  - Measure improvements in patient flow, using established metrics, such as Observed versus Expected Length of Stay (OMELOS), Utilization Management data, and avoidable days
  - Utilize avoidable days data to identify specific areas to reduce Length of Stay (LOS)
  - Improve LOS by focusing on the management of hospital flow, communications and coordination, while incorporating the deployment of VA’s Bed Management System software and other technological systems

• **Bedside care collaborative:** Forty multi-disciplinary teams are working together with senior leadership, faculty, and coaches to design, test, and implement efficient processes in delivering care and optimizing the work environment. Their goal is to empower front-line staff to drive performance initiatives, improve team collaboration, create safe and reliable care processes without waste and delay, and increase staff and patient satisfaction. They derive their key metrics from the principle of balancing demand and supply on the respective unit(s), including improvement in nursing time “saved” for increasing time for direct patient care, improvements in supply/equipment availability, and data on patient and staff satisfaction.

• **Cancer care collaborative:** This group designs, tests, and deploys new clinical models of timely and reliable cancer care, leading to fundamentally improved patient care. It consists of 18-20 teams and expert VA resources, which come together to learn from each other. They apply this knowledge to cancer care in their area of focus: colorectal, lung, prostate and breast. Use of measures of “reliability,” (i.e., specific disease processes and treatments using the current best evidence-based methods), help support national work on quality of care. Each team uses systems redesign and lean techniques to identify the core issues in their own process of care and develop facility-specific aims.

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72 Veterans Health Administration. *Bedside Care Collaborative Handbook (Draft 5)*, January 2009.
**Human Resources (HR) recruitment improvement collaborative:** This group designs, tests, and deploys new models of recruitment practices to maintain or increase supply of service providers. The primary goal of this collaborative is to reduce delays in recruitment for Nurses (Title 38) and a Title 5 position of the team’s choice, to a 30-day time standard. They measure from the date of application/tentative selection to the point of firm offer, while also improving patient, provider, and staff satisfaction.⁷³

**Mental health improvement project:** This group designs, tests, and deploys new models of office and inpatient-based mental health practices. The primary goal of this collaborative is to reduce delays in access to care to within a single day for mental health outpatient screening, and within 14 days for a complete new patient mental health evaluation. A secondary goal is to improve residential/inpatient flow, thereby reducing waits in accessing programs and reducing avoidable hospital days by 10%.⁷⁴

### Additional Change Tools

In addition to PDSA, VHA also applies other change tools. A sample of the more commonly used tools is provided below.

**Rapid Process Improvement Workshops (RPIW)**

This tool assesses the current state of the process and redesign of the current processes or systems to meet specific objectives, timeline, and deliverables. VHA's current RPIW strategy calls for five 8-hour project team sessions, held sequentially during one week. The objectives for the RPIW sessions are to:

- Define the problem and processes under investigation
- Baseline current systems and processes
- Identify operational barriers and failure modes in current processes
- Apply basic and advanced systems engineering principles to redesign current processes to eliminate or mitigate failure modes
- Design and perform an implementation pilot to test process redesign
- Implement new processes and systems with a robust control strategy to ensure long-term sustainability of improvements⁷⁵

For additional information on RPIWs, refer to the "Lean Improvement Participant Fieldbook," produced by Heather Woodward-Hagg and Dr. Peter Woodbridge.

**Sort, Set in Order/Straighten, Shine/Scrub, Systematize, and Sustain/Standardize (5S)**

5S is an approach to waste and variability identification, utilizing techniques to organize a workplace or workspace. 5S is a simple and practical approach to improvement that can achieve a great amount of results in a very short period of time. The 5S steps are: sort, set in order/straighten, shine/scrub, systematize, and sustain/standardize. In some organizations there is a 6th S added: safety.

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⁷⁴ Mark Murray and Associates. *Mental Health Improvement Project*.
This 5S process focuses on cleaning, organizing, and arranging a workplace to eliminate the waste associated with looking for items required to complete a process. For example, it is estimated that nurses spend greater than 40% of their time locating information, equipment, or materials required for patient treatment. 5S results in dramatic changes; it is not just a housekeeping program.76

For additional information on these and other change tools, please refer to the "Lean Improvement Participant Fieldbook," produced by Heather Woodward-Hagg and Dr. Peter Woodbridge.

**The four outcome factors: duration, integrity, commitment, and effort (DICE)**

The following four factors will determine the outcome of any change initiative:

- **Duration:** The duration of time until the change program is completed if it has a short life span. If the project is long, the amount of time between reviews of milestones.

- **Integrity:** The project team’s performance integrity, its ability to complete the initiative on time. This depends on members’ skills and traits relative to the project’s requirements.

- **Commitment:** Top management and employees affected by the change display commitment to the initiative.

- **Effort:** The amount of effort over and above the usual work that the change initiative demands of employees.

The different ways in which organizations combine these four factors create a continuum, from projects that are very likely to succeed to those that are most likely to fail. For example, a short project, led by a skilled and cohesive team, with leadership support, which is implemented in a department that is receptive to the change and requires little additional effort, is bound to succeed. At the other extreme, a long, drawn-out project, which is executed by a disjointed team, lacks leadership support, targets a function that dislikes the change, and requires a lot of extra work, will fail. While it is easy to identify change programs at either end of the spectrum, most initiatives occupy the middle ground, where the likelihood of success or failure is more difficult to assess. Study the four DICE factors carefully, make appropriate adjustments to the project (e.g., adjust schedule, change scope, increase communication, obtain leadership support), and increase the likelihood of your program's success.77 If your project seems likely to fail, consider cancelling it. Invest the resources in a more beneficial program.

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7. Sustain and Spread Change

This chapter on sustaining and spreading change addresses the following questions:

- If everyone on your team quits or retires, how do you know these change strategies will continue to be used?
- How can you share lessons learned with others who could apply this knowledge to improve services they provide?
- What are some factors affecting Sustainability?

If your team has finally reached the point where it has found a way to improve a work process, they may not realize its work is unfinished. Some old processes may reappear, or new processes may disappear or change, reversing the effect of the improvement that the team worked so hard to design and test. The concepts of "sustain" and "spread" are closely related. Sustained improvements will continue to provide value to Veterans and employees who serve them at the site at which they were first implemented, and could potentially improve services if they "spread" to similar settings throughout the Veterans Health Administration.

Many good ideas can be applied in more than one VA facility, so "spreading" new developments to other units and work areas can multiply the value of the improvement significantly. VHA leaders also have a responsibility to help teams easily learn what other teams in similar situations may have already discovered about how to improve a particular process. Senior leaders must clearly demonstrate their commitment and support for proposed changes, for without their support, many of the best ideas will never be adopted. Communication and teamwork are also essential components in the improved provision of safe, efficient care. Published studies, along with worldwide experience in improvement, clearly show direct relationships between the level of teamwork, safety, and efficiency that result. These relationships, the “soft stuff” of our day-to-day work, provide the critical “lubrication” that moves our systems forward. Communication requires dedicated resources and desire, the result of consistent effort.

Section Takeaways:

<table>
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<th>Sustain (and Spread)</th>
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<td>What is Sustainability? Performance improvements persist over time.</td>
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<td>What is Spread? The application of tools and techniques outside of the original project focus area.</td>
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<td>Sustain and Spread Tool: Pilot Implementation Plan</td>
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Reason for senior leadership involvement:

Almost every organization today has multiple strategic objectives. Some of these objectives may be at odds with managers' highest priorities. Leadership must make the priorities clear. For example, leadership may decide to utilize nursing staff in a new way that will improve care and reduce costs across the system. Suppose this involves reassigning a nurse to a new activity that, while more productive, takes resources away from what remains a part of the established routine of daily clinical care. A clinic manager may rightly feel pressured to keep a nurse doing the mundane task of ear lavage, for example, rather than devote needed resources to a not-yet-established new idea. While this manager fails to support the strategic objective, it also means that leadership has failed to communicate the importance of the new objective to the manager. They must encourage the manager to support the new objective in ways that makes its importance clear, be aware of its acceptance, and find solutions to problems that may arise. In a case like this, front-line personnel need guidance.

Sustain

Once your team has determined that a given strategy was successful in narrowing the quality gap, you need to sustain the improvement, implement the improvement more broadly, and monitor results on an ongoing basis. Producing lasting changes in practice can be very difficult. To increase the chances that improvements will endure, integrate process changes systematically into standard operating procedures, rather than relying on specific individuals to sustain them. For example, if the service chief of a particular department takes another job, the process changes that were implemented during his or her tenure must continue seamlessly. If they do not, it is likely that the process was not sufficiently integrated into day-to-day operations.

How do you assess sustainability? No one measure can assess the sustainability of every change, especially if the change is far-reaching. One approach to assessing sustainability for many changes is to score them, such as:

- **Excellent**: Fully implemented, sustained to goal for greater than 12 months
- **Good**: Significant or partial implementation, sustained to goal for greater than 6 months
- **Fair**: Some implementation occurred, but did not sustain to goal for greater than 3 months
- **Poor**: No Implementation, and/or did not meet goal for at least 3 months following implementation or other sustainability issues

Factors affecting sustainability

Employee attitudes toward a proposed change predict success, so your team must understand the preferences and willingness to change of front-line staff. As noted above, senior management and leaders must demonstrate their support for change. Other factors affecting the sustainability of change include:

- **Bottom-Up vs. Top-Down Initiatives**: Drive change from the lowest level possible within the organization.
- **Small Incremental Tests of Change**: Implement gradual change, beginning with the lowest levels of implementation complexity and migrating to higher levels.
- **Regular Data Feedback to Front-Line Staff**: Present process performance data to the front-line staff on a regular basis, reducing the frequency as the process achieves stability.
- **Accountability**: Monitor performance metrics and provide encouragement and recognition to staff for high performance.
Spread

How do you assess spread of your tools and techniques? Consider scoring them according to the following criteria:

- **Excellent**: Principles are readily adopted in other units or project areas, at least in part as a result of effective communication.
- **Good**: Principles spread to other units or project areas, but there is evidence that the principle is not always readily adopted.
- **Fair**: You find some evidence of application of principles beyond initial project area.
- **Poor**: You find no evidence of application of principles beyond initial project area.

A bulletin available on the website of Sarah Fraser and Associates suggests that monitoring the spread of good ideas involves:

- **Communication**: What is the awareness level of the adopters? Do they know about the innovation? How much do they know?
- **Decision making**: When did the adopters make the decision to implement the new ideas?
- **Implementation**: Has the new practice been implemented? To what extent?

What are the factors influencing Spread?

- **Perceived benefit**: What are the organizational and personal benefits?
- **Compatibility**: How do the new ideas integrate with existing systems, values, beliefs, and current needs?
- **Simplicity**: Are the ideas and processes as simple as possible? Simple innovations spread faster than complicated ones, due to the role of adaptation in spread of innovation.
- **Workable**: Are the processes feasible? Test and verify changes prior to full implementation.
- **Observability**: Can you measure the outcomes? Conduct tests of change in such a way so as to be readily observable by other ‘early adopters.’

Once a given intervention has proven effective, consider how to spread it for broader implementation (e.g., across additional units, settings, facilities, networks, or the entire system). The target of dissemination will depend on the scope and boundaries of the practice, the effectiveness of the change, and an understanding of who might benefit from broader application of the change. In preparing to disseminate an improvement widely, your team must keep in mind that the change in practice may need to be refined and adapted, if it is to succeed in another setting that will probably not be completely identical to the original setting. Each setting has features that must be taken into account and will affect improvements.

**Sustain and Spread Tool: Pilot Implementation Plan**

One way to monitor the sustainability and spread of change is to develop a pilot implementation plan, which outlines implementation of solutions throughout a 90-day cycle. This type of implementation strategy is often referred to as a "staggered" implementation. Often, the scope of the implementation during the pilot is narrowed to a specific patient population or unit.

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Your team creates an implementation plan, detailing the actions that will occur prior to implementing a specific process redesign component. Assign team members as owners for individual action items, and determine dates for completion. The components of the pilot implementation plan include a list of changes that will be implemented.80

**Sustain and Spread Tool: Control Plan**

Provide regular, daily feedback through the pilot implementation to assess the effect of process changes. Display daily reports or assessments prominently within the process areas to encourage staff to discuss progress and foster awareness among staff members including those not on the process team. A control plan will include the following information:

- **Metric**: Description or title of measurement
- **Target value**: Goal or Target operating value
- **Data source**: Location of data
- **Collected by**: Persons or role responsible for data collection
- **Sample size/frequency**: Number of samples and how frequently data will be collected
- **Collection method**: How the data will be collected (i.e. historical, manual, paper form, online tool)
- **Review frequency**: Frequency that the data will be reviewed (i.e., daily, weekly, quarterly)

Monitor the metrics affected by the implementation plan as part of the pilot control plan, if possible.81

**Continuous monitoring**

Perform ongoing monitoring. Practices may unexpectedly revert to the pre-intervention baseline, or changes made in one part of the system may directly counteract the improvements made in another. For example, one facility instituted a new electronic reminder system that improved an ethics-related health care practice. The system was working well until a national update to the computerized patient record system resulted in deleting the local reminder system. The team was monitoring ongoing activities, so it noticed this change and addressed it. Otherwise, the facility would have reverted to its prior inefficient practices, and the improvement efforts would have been wasted.82

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Lessons Learned from Over Monitoring:

Case:
- A team aimed to improve the discharge process with a simple initial test of change: The nurse will write the anticipated date and time of discharge on a white board in the patient's room. A month later, the team leader followed up with the initial data. Hall A, with the white board, discharged 81 patients and had an average length of stay of 4.8 days and discharge time of 11:15 a.m. Hall B, which did not adopt this technique, discharged 74 patients with average length of stay of 4.9 days, and discharge time of 11:53 am. The team then set about planning a second step.

Lessons:
- Monitor effectively, but match the intensity of monitoring with the magnitude of the change. Your team can try several new ideas simultaneously. Over-monitoring small tests will slow the process down and demoralize eager participants by forcing them to spend time monitoring, rather than implementing change. In many instances, you only need a huddle after piloting an idea on several patients. Concentrate more intensive monitoring efforts on displaying progress toward your team's overarching, collective goal.
Glossary

5S - Approach to waste and variability identification utilizing techniques to organize a workplace or workspace: Sort, Set in Order/Straighten, Shine/Scrub, Systematize, and Sustain/Standardize

90% or 90/10 Solutions - Solutions in which large gain are obtained with minimal investment

A

ACA – Advanced Clinic Access; VHA initiative focused on improving access to care for Veterans

Accreditations – Credit or recognition by an official review board

Action plan – Specific method or process to achieve the results called for by one or more objectives

Affinity diagram – Used to collect and organize input from across a group or team in order to identify opportunities for application of systems redesign within the sponsoring organization

Aim statement – Explicit statement summarizing what the team hopes to achieve during the project

Analysis – Establishing priorities to identify the most important areas to focus improvement efforts and evaluate performance

Assessment Readiness – Business case; statement of necessary resources to invest and an estimate of potential gains in performance

Batch – A collection of items or persons to be handled together

Benchmarking – Standard for measuring a process against leading practices in order to improve performance

Brainstorming – Method of shared problem solving in which all members of a group spontaneously contribute ideas

Bottlenecks – A narrowing that reduces the flow through a channel

Boundaries – The line or plane indicating the limit or extent of something

C

C4 – Colorectal Cancer Care Collaborative – VHA initiative to redesign systems in order to improve the quality of care delivered to patients with a positive colon cancer screening test, or those with symptoms that suggest colorectal cancer

Cause-and-effect (aka the "Fishbone" diagram) – Tool which graphically represents potential causes for why there is a gap between current performance and best practice, as well as help to focus the team on what causes might be most amenable to change

Cells – The smallest organizational unit of a centralized group or movement

Centerline – The average of plotted values

Change – Part of the VA-TAMMCS framework; Plan-Do-Study-Act (PDSA) cycles are the primary tool for implementing change
Change Principles – Universal truths in system design; underlying details or strategies; change ideas consistent with a principle that can be adopted or adapted by the team

Changeover – An event that results in a transformation

Checksheet – Worksheet template used to collect quantitative process output data, such as compliance and adherence data, or frequency of occurrence for operational barriers

CLC – Community Living Center; transformational initiative, which addresses VHA's need for improved long-term care services

Clinical Stress – Variability in type and severity of disease

Collaborative – Structured framework within which teams learn about research and best practice, apply quality methods, and exchange their experiences of making improvements

Common Cause – Random shifts in the process, due to the nature of the process

Communication – The exchange of thoughts, messages, or information, as by speech, signals, writing, or behavior

Community – Stakeholders affected by or who can affect the success of the change

Competencies – The quality of being adequately or well qualified: physically and intellectually

Content – Idea, solution or innovation being introduced to the workplace

Context – Social, organizational, and technological environment considerations for developing solutions or implementing the change

Continuous Cycle – Understand, analyze, and improve

Continuous Improvement – See definition for "Systems Redesign." Also used interchangeably with "Process Improvement."

Continuous learning – The ability to continuously seek new knowledge, skills, and information, through formal and informal learning throughout one's career. As a result, the learner continues to expand his or her capacity for working more effectively

Control chart – A graph that plots randomly selected data over time in order to determine if a process is performing to requirements or is, therefore, under statistical control. The chart displays whether a problem is caused by an unusual or special cause (correctable error), or is due to chance causes (natural variation) alone.

Control limits – Define the expected limits of variation when the process is stable

Count chart (c Chart) – A graph that plots randomly selected data over time in order to determine if a process is performing to requirements, including: qualitative attribute data; discrete numbers or counts; number of defects in a subgroup (e.g., complaints, rework, missed due dates, delays, rejects)

Critical path method – A model to map the activities and events of a project as a network. It provides a graphical view of the project, predicts the time required to complete the project, shows which activities are critical to maintaining the schedule, and which are not

Cross function flow chart – Diagram that shows the relationship between a business process and the functional units, such as departments, responsible for that process.

Current-State Map – Picture used to understand and communicate the current process
Data – Factual information, especially information organized for analysis or used to reason or make decisions

Data gathering – Collecting specific data about current practices to establish a baseline against which to compare the results of future improvement efforts.

Deploy – To put a process into use or action

Dispersion – The scattering and breakup of the values of any type of distribution from the average or normal, causing it to become spread widely throughout the organization.

External and internal boundaries – Organizational environment have two types of boundaries 1). Internal: including management and staff; and 2). External: including customers, competitors, suppliers and relevant government agencies. Since these can sometimes be in conflict with each other, boundary spanners can help to allow external feedback that helps the organization stay on track.

Facilitator – An improvement professional, who has deep knowledge and skill doing improvement work

Feedback – The return of a portion of the output of a process or system to the input, especially when used to maintain performance or to control a system or process

Framework – A step-by-step approach to systematically improve the performance of a system

Flow chart – A schematic representation of an algorithm, a sequence of operations, or a process

Goals – The purpose toward which change initiative is directed; an objective

Haphazard – Dependent upon or characterized by mere chance

Histogram – A graphical display of tabulated frequencies showing what proportion of cases fall into each of several categories

HPI – Human Performance Improvement; a systematic process of discovering and analyzing important performance gaps, planning for future improvements, designing and developing cost-effective and ethically justifiable interventions to close performance gaps, implanting the interventions, and evaluating the financial and non-financial results

Illustrate – To clarify the change aim, as by use of examples or comparisons

Implement – To put change into practical effect; carry out

Incremental – The process of increasing in number, size, quantity, or extent of change

Inhibit – To hold back; restrain

Initiatives – The power or ability to begin or to follow through energetically with a plan or task

Innovation – The act of introducing a new process
Interdependencies – Mutual dependence, connection, or correlation between entities affecting change

Interrelationships – An interaction between mutual entities affecting change

Intuitive reasoning – Intuition is an immediate apprehension or cognition, based on an individual’s knowledge and life experiences, often without evident rational thought and interference. Since reasoning tends to link experience with universal meaning based on methodology, intuition can be a guiding process for reasoning.

Line chart – A method for showing trends in quality, cost, customer satisfaction, etc.

Lower control limit – The bottom limit in quality control for data points below the control (average) line in a control chart

Macro flow chart – The steps in a process, connected in a linear fashion. It provides a high-level perspective on a process, a quick representation. It allows you to compare several processes in order to identify improvement areas.

Matrix – A situation or surrounding substance within which something else originates, develops, or is contained

Micro flow chart – Often called a deployment chart, it assigns steps of a process to the individual who performs them, and briefly describes a more detailed action phase of the process. It provides a comprehensive view in order to organize the detailed steps in a process

Management – The person or persons who control or direct a business or other enterprise

Mean – The approximate statistical norm or average of a set of numbers

Mechanism – A system of parts that operate or interact like those of a machine

Median – The middle value, separating the upper numbers from the lower numbers

Mental model – A description of a front-line staff person’s thought process for how something works in the real world. It is a kind of internal symbol or representation of external reality, hypothesized to play a major part in cognition.

Mission statement – A short but complete description of the overall purpose and intentions of an organization; it provides the focus on what is to be achieved, and defines the scope of the business

Mode – The value that occurs most frequently in a data set

Modeling – An activity that stands as an equivalent for another activity or results in an equivalent

Monitor – To track systems with a view to collecting outcome data

Outcome – An end result; a consequence

Paradigms – A clear or typical model or archetype

Pareto charts – A bar chart, with the values arranged in descending order
**PDSA** – The model fits with Plan-Do-Study-Act cycle

**Percentage chart (p Chart)** – A graph that plots randomly selected data over time in order to determine if a process is performing to requirements; it can include qualitative attribute data; discrete or counts; percentage defective (e.g., complaints, rework, missed due dates, delays, rejects)

**Points** – Individual measurements, averages, counts, or percentages on a chart

**Process** – A series of actions, operations, or functions bringing about a specific result

**Process map** – A flowchart of a work process that lists the steps, details, and measurements necessary for the process to work properly

**Process owners** – A manager or leader who is responsible for ensuring that the total process is effective and efficient

**Productivity** – The rate at which goods or services are produced, especially output per unit of labor

**Quality circles** – Quality improvement or self-improvement study groups composed of a small number of employees and their supervisor. Quality circles originated in Japan, where they were called quality control circles.

**Qualitative data** – Non-analytical data (i.e., opinions, ideas, thoughts)

**Quantitative data** – Continuous data (i.e., number of errors, number of patients), measured or identified on a numerical scale, which is analyzed using statistical methods; results can be displayed using tables, charts, histograms, and graphs

**QI** – Quality Improvement

**Range** – The difference between high and low values in a set of observations

**Reengineering** – The radical redesign of an organization’s processes, especially its business processes.

**Reliability** – The extent to which an experiment, test, or measuring procedure yields the same results on repeated trials

**Root cause analysis** – A structured approach that focuses on the decisive or original cause of a problem or condition

**Run chart** – Graph that shows a measurement against time, with a reference line to show the average of the data (a simple monitoring tool that indicates a trend of change or process over a specific time)

**Scatter diagrams** – A diagram that establishes whether or not a relationship or correlation exists between two variables

**Scenario planning** – Strategic planning method that some organizations use to make flexible long-term plans; an adaptation and generalization of classic methods used by military intelligence.

**Scope** – The project boundaries, range of operation
**Sequence** – A following of one thing after another; succession

**Silo** – A health care system has many such nerve centers — often called "silos" in business slang — that traditionally operate independently of one another.

**Six Sigma** – Measure of quality that strives for near perfection, a process must not produce more than 3.4 defects per million opportunities

**Six Sigma Defect** – Anything outside of customer specifications

**Special cause** – A factor that sporadically causes variation, a correctable error

**Stable** – The statistical model for the process that stays the same overtime

**Standard deviation** – A mathematical expression of the tendency of values to vary from the arithmetic mean

**Statistics** – A mathematical science pertaining to the collection, analysis, interpretation or explanation, and presentation of data

**Structural variation** – Systematic changes in output, caused by such things as seasonal factors or long term trends

**Survey** – To examine or look at comprehensively

**Systems thinking** – Focuses on seeing multi-dimensional patterns, recognizing them, and organizing these interconnected patterns through intuitive perception. Systems thinking is necessary in order to perceive the whole and understand how to work effectively through all systems that affect the organization

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**Tampering** – Unnecessary adjustments made to a process in an attempt to compensate for a common cause

**Team culture** – A group culture with a common, collaborative work approach, clear roles and responsibilities. They hold themselves mutually accountable for the team’s performance. Effective teams display confidence, enthusiasm, and seek continuously to improve their performance.

**Team structure** – A group of interdependent individuals who have complementary skills and are committed to shared, meaningful purpose and specific goals.

**Total Quality Management/Total Quality Improvement (TQM/TQI)** – A management approach that is mainly concerned with continuous improvement in all work, from high-level strategic planning and decision-making, to detailed work elements on the shop floor. It stems from the belief that mistakes can be avoided and defects can be prevented.

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**Unstable** – A statistical model for the process that changes overtime

**Upper control limit** – The top limit in quality control for data points above the control (average) line in a control chart

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**Validate** – To establish the soundness of; corroborate

**Validity** – Meaningfulness of the data (variable data, averages, and ranges)
Variation – A change in data, a characteristic, or a function that is caused by one of four factors: special causes, common causes, tampering, or structural variation.

Vision – A statement that explains in measurable terms what an organization wants to become and what it hopes to achieve
Appendix A

Additional Examples of Successful VHA Transformations

**National Center for Organizational Development (NCOD)**
The National Center for Organizational Development (NCOD) provides tools, such as the Leadership Development and All Employee Services (AES) Assessments, and support for organizational development projects. NCOD programs include CREW, AES, and translation of research from the Center for Organization, Leadership, and Management Research (COLMR). NCOD addressed VHA's need for third-party organizational development expertise. It is considered transformational, because it represents a clear investment in VHA employees and human resources.

NCOD started with a clear vision and met an unmet need for a "true third party." NCOD’s success is also predicated on the availability of a wide skill set, with the capacity to support for a broad array of organizational development projects. NCOD provides action planning resources, has established feedback mechanisms, and offers consultations. NCOD "companions" assist the sites through coaching and education. In order to sustain and spread the transformation, NCOD invests in employees and prepares them to successfully develop their organizations. NCOD is constantly evolving and collaborates with external organizations to continuously learn (i.e., NCOD's collaboration with eight hospitals in Canada using CREW).

**Uniform Mental Health Services Package**
The Uniform Mental Health Services Package consists of four components: access to care, mental health/primary care integration, rehabilitation and recovery model, and suicide prevention. The package ensures consistency in care across VA medical centers for the growing Veteran population with mental illness. Successful implementation resulted from a "burning platform," namely the variation in mental health services from site to site. The package was evidence-based, had persistent and committed champions, and provided resources and training for all staff levels. In order to sustain and spread the transformation, the package took the following steps: clearly stated expectations; developed a common mantra ("mental health is equally important"); focused on the best mechanisms for training; integrated services with medical care; created a three-dimensional metric system consisting of structure, process, and outcomes measures; and targeted early adopters through a request for proposal (RFP) process asking for volunteers to get involved during the first year. It offered coaching to sites who responded to the RFP.

**Blue Ribbon Panels**
VHA's Blue Ribbon Panels consist of external experts who brainstorm the issues assigned to their respective panel. The outcomes of the various panels are different and specific to the issues being addressed. One example of a VHA Blue Ribbon Panel is the panel on VA Medical School Affiliates, tasked with determining novel ways to partner with affiliates. That panel analyzes past affiliations, identifies any issues with current affiliations, and highlights success stories. VHA's Blue Ribbon Panels support the agency's goal of being a learning organization. Blue Ribbon Panels are successful, because they facilitate collaboration between the expertise of external stakeholders and VHA system specialists. In order to sustain and spread the transformation, panels evaluate current VHA practices and processes.

**MRSA/Hospital-Acquired Infections Program**
VHA's MRSA/Hospital-Acquired Infections Program aims to reduce hospital-acquired infections through improved quality of care. This program was transformational due to its role in changing how clinicians understood the importance of reducing hospital-acquired infections. A checklist
developed by program staff led to a decrease in infections. This program benefited from employee and leadership support, external interest in the issue (program launch coincided with the Institute for Healthcare Improvement's 100,000 Lives Campaign), the program's origin at the front line (it began in a nursing unit in the Pittsburgh VA medical center), and dedicated resources. In order to sustain and spread the transformation, the program office identified site-based coordinators, sent program experts to conduct site visits and provide in-person education, and established collaborations with outside agencies (i.e., with CDC to create a hospital-acquired infections database to benchmark VHA data with other providers).

**My Health-E-Vet**
My Health-E-Vet is a web portal for patients to access their health information and reorder medications. The system provides the patients with clinical reminders, and will soon be an avenue for patients to communicate with their primary care physician through secure messages. Veterans wanted increased access to information. The portal's success was due to multiple partnerships and collaborations (e.g., IT and business owners, a steering committee composed of clinicians and patients, and patient focus groups), the program's clear vision and well defined milestones, and the persistence of program champions. In order to sustain and spread the transformation, the My-Health-E-Vet initiative is supported with dedicated monetary and staff resources, because it is a crucial component of providing Veteran-centered care.

**Systems Redesign**
The purpose of systems redesign is to improve systems and process performance. Systems redesign includes Lean, ACA, FIX, systems improvement capability projects, and the Veterans Engineering Resource Center (VERCs). VHA’s systems improvement methods focus on patient access, throughput, and level of care transitions. Systems redesign is successful due to the existence of a "burning platform" around the need to increase patient capacity, front-line staff engagement, passion and persistence of initial champions, external partnerships (i.e., with the Institute for Healthcare Improvement, who provided expertise until VA had developed institutional knowledge), a clear return on investment (in terms of quality of care and patient satisfaction), and a well defined measurement system. In order to sustain and spread the transformation, VHA created the infrastructure required to support partnerships and to measure facility performance at regular intervals. Barriers to successful systems redesign efforts include the time availability of front-line staff to engage in systems improvement work and the lack of staff having the necessary skills to analyze performance data.