

## Chapter 66

# CONTINUOUS PROCESS IMPROVEMENT USING LEAN SIX SIGMA CONCEPTS

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## Introduction

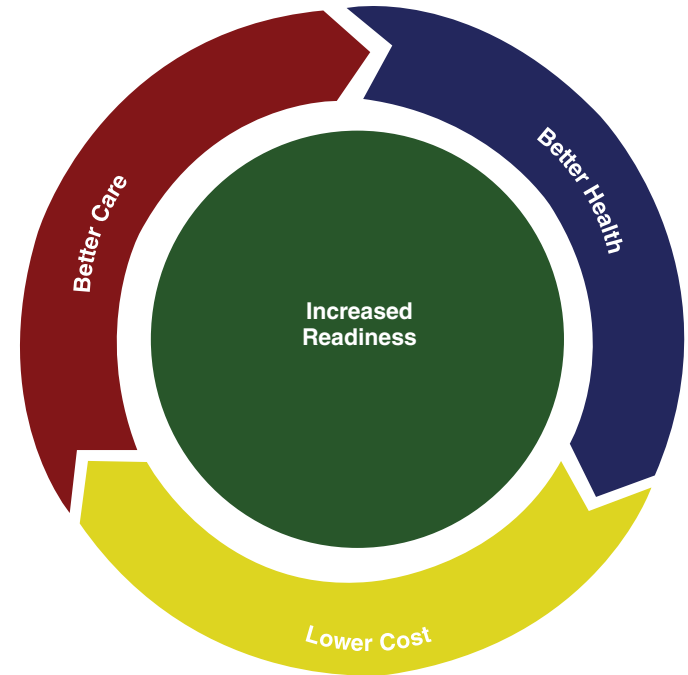
All Army physician assistants (PAs) must be involved in continually improving the organizations in which they serve. PAs demonstrate dedication and commitment to the organization through leading and participating in continuous process improvement (CPI) of their organization and its processes. CPI projects bring together subject matter experts with ideas to improve outcomes with potential for system-wide and even enterprise-wide implementation. Used by the Department of the Army as a CPI program, Lean Six Sigma (LSS), and the related Lean Daily Management (LDM) concept, is relevant to health care organizations (Figure 66-1). As of publication, the Army Medical Command (MEDCOM) LSS program is undergoing a transition to the Defense Health Agency (DHA). The DHA uses CPI, LSS, and high-reliability organization (HRO) concepts for its Quadruple Aim Performance Process (QPP) (Figure 66-2).<sup>1</sup> By completing LSS projects and training, including LSS certification, PAs can distinguish themselves from other officers, earn additional skill identifiers, implement cost reductions, increase profits, improve the quality of products, and use these skills at any duty station and in the civilian sector.<sup>2</sup> This chapter introduces several of the process improvement tools and methods being used in military medicine, especially by the DHA as it takes on more responsibility for providing care.



**Figure 66-1.** Department of the Army Lean Six Sigma logo.

### Background

Every organization is driven by quality, cost, and speed considerations. Organizations may need improvement due to lengthy processing times, poor quality, or both. Continuous improvement is “the ongoing improvement of products, services and processes through incremental and breakthrough improvements.”<sup>3</sup> LSS tools provide a framework to examine and meet organizational needs such as accelerating a product or service delivery, decreasing costs, and improving a product or service quality. Military medical treatment facilities (MTFs) and other health care organizations are using LSS and other models for CPI, and there is also room for LSS application in the operational environment. The



**Figure 66-2.** The Quadruple Aim Performance Process (increased readiness, better health, better care, and lower cost).

tenets of LSS can be applied anywhere to any process that needs some level of improvement to enable better outcomes.

### Lean Six Sigma Process Steps

LSS consists of five process steps, signified by the acronym “DMAIC,” that must be completed in sequential order. Each steps ends with a “gate review”—a collection of all the required components needed to fully complete each step and move on to the next. “DMAIC” refers to the following steps<sup>4</sup>:

1. **Define.** This step involves identifying the problem, the scope of the problem, the goals that the team wants to achieve to improve the situation, a validation of the problem through data sources or the process owner/business/customer, and the financial benefits. A project charter is completed in this step. Team members map out the process steps from start to finish and do their best to determine how long it takes between and at each step. During this step in the process, the team creates a communication plan, defining who will perform what actions during the process and by what means and how frequently the information will be communicated. In addition to this plan, a project plan lays out how long the team will spend working on each step in the process and the tentative deadlines.
2. **Measure.** This step helps identify the extent of the problem by collecting data. During this step, the team develops a value stream map, a data collection and analysis plan, baseline data, and other specific analyses in preparation for conducting the gate review.
3. **Analyze.** Key aspects in this step are determining whether the steps bring value to the process, calculating the process cycle efficiency and comparing it to the standard or recognized benchmark, analyzing the process map to find sources that impede the flow of work, and finding root causes of issues that create friction or constrain the process (lack of training, lack of resources, unclear procedures, etc).
4. **Improve.** In this step, the team explores potential solutions to the problem and develops a new process value stream map. The team also develops an implementation plan and pilots that plan. Upon the conclusion of the pilot, the team continues with a full implementation plan.
5. **Control.** This is the final step in the DMAIC process, whereby all the lessons learned are captured and applied to the process and actions to monitor the new plan are put into place. The intent is to check the process months later to analyze any outcomes and financial gains.

### Lean Daily Management

LDM is an operating system with steps and tools that can be used to train leaders and teams to find and solve problems at the front line.

It can be used in both military and civilian health care organizations. Health care executives and leaders should understand LDM's relevance and be able to recognize the elements of LDM and its applications. In LDM, "lean" is the process of eliminating waste and driving productivity, commonly using CPI, with the goal of creating value using a set of principles, concepts, and techniques.<sup>2</sup> In a lean health care organization:

- The job of every frontline care team is to provide safe, quality care and to find and solve problems.
- The job of every other team is to support the frontline care team.<sup>2</sup>

### High Reliability Organizations

MTFs have embraced the tenets of HROs, which are (1) leadership commitment to the ultimate goal of zero patient harm; (2) safety culture supporting high-reliability performance; (3) work toward creating robust process improvements; (4) "lean"; (5) "Six Sigma"; (6) change management; and (7) tiered huddle systems.<sup>2</sup> HROs "operate under very trying conditions all the time and yet manage to have fewer than their fair share of accidents."<sup>3(p1)</sup> "High reliability" means striving to get things right each and every time. The first three of these tenets are especially important for making substantial progress toward "high reliability":

1. *Leadership commitment to zero patient harm.* Leadership that is committed to zero patient harm will look closely at risk management outcomes, case reviews, patient safety reports (PSRs), and any other areas that can indicate patient harm.
2. *Incorporation of all principles and practices of safety culture throughout the organization.* Leadership that cares about safety will vocalize it and make it known that safety is important, so that everyone is on same page. Appropriate actions might include examining PSRs and ensuring that a culture of reporting PSRs is acceptable and encouraged to avoid future mishaps. PAs can report PSRs in their area and work with nursing staff who manage PSRs to investigate issues and identify solutions or quick wins. In in their own sections, PAs can ensure adherence to simple safety measures, such as avoiding alcohol before driving or keeping a weapon's safety on when it is not in use. A great determinant of

success is when simple, routine business involves risk assessment and safety at every step. If something more than a quick change is needed, a project could be the answer.

3. *Widespread adoption and deployment of robust process improvement tools and methods.* Using tools such as LSS and change management, leaders should note when something goes wrong (instead of avoiding the additional work involved, looking the other way, or leaving problems for the next person in charge). When everyone gets on board to conduct CPI and shares resulting information, there are always opportunities for improvement.

### **Total Quality Management**

Another concept, total quality management (TQM), is the philosophy used to strategically improve quality in health care.<sup>4</sup> The DHA is using TQM principles during its efforts to become an HRO. The TQM principles are:

- customer focus,
- leadership,
- engagement of people,
- process approach,
- improvement,
- evidence-based decision-making, and
- relationship management.

### **The Quadruple Aim Performance Process**

Human error in the care of patients is an increasing concern. The Institute of Medicine Committee on Quality of Health Care in America estimates that errors in patient care cause close to 200,000 deaths per year.<sup>5</sup> Harm is defined as “an impairment of structure or function of the body and/or any deleterious effect arising therefrom, including disease, injury, suffering, disability, and death.”<sup>6</sup> Harm may be physical, social, or psychological, and either temporary or permanent. An adverse event is an injury directly caused by an error in care, and not due to a disease process. Clinical objectives seek to prevent all harm to patients. LSS principles can be a mechanism to accurately identify these problems, analyze each situation to get to the root causes of error, and implement

new or revised procedures to prevent future preventable harm. Based on the TQM philosophy, the military health system (MHS) transition to the DHA utilizes the QPP to get to “zero harm,” the first goal of an HRO. The QPP is more than a plan; it is the process by which all staff engage the entire MHS to achieve breakthrough performance in pursuit of the “Quadruple Aim”: increased readiness, better health, better care, and lower cost. Balanced across these four elements, its goals are to align the health care services and resources with MTF activities to enhance the MHS’s integrated system of readiness and health, promote system learning and continuous improvement, support a smooth transition of administration and management of MTFs to the DHA, and enable enhanced enterprise performance.<sup>2,4</sup>

### **“A3” Thinking**

Another method DHA had adopted for QPP is the “A3” problem-solving method, executed on a single sheet of A3-sized paper (a metric size close to 11” × 17”, which is typically used).<sup>2</sup> This tool enables and encourages learning through the scientific method, with the following attributes:

- can be used by a team or individual;
- fosters consensus building;
- offers a simple systematic methodology for process improvement and complex problem solving;
- allows communication through a logical narrative;
- makes problem-solving visual; and
- tells a story (on a single page).

### **Lean Six Sigma Training**

LSS courses provide valuable training, continuous learning points for officers in the Acquisition Corps (discussed in Chapter 44), promotion points for enlisted personnel, and additional skill sets and additional skill identifiers. Green Belt Courses and beyond are Army Training Requirements and Resource System (ATRRS) courses. (Note: The International Six Sigma Institute is NOT authorized to award promotion points). LSS courses must be reflected on a soldier’s ATRRS transcript.

### ***Additional Skill Identifiers***

On May 23, 2006, the Army G-1 (manpower office) approved a proposal by the deputy undersecretary of the Army for business transformation to establish the following LSS skill identifiers<sup>7</sup>:

- Green Belt (1X)
- Black Belt (1Y)
- Master Black Belt (1Z)

### ***Tips for Attending Courses***

- Check the current schedule in ATRRS to see when courses are offered.
- Notify your chain of command and local deployment director (DD), and discuss potential projects with both (you cannot attend a Lean Leader, Green or Black Belt course without an approved project [charter]).
- Select a project approved by your chain of command and the DD.
- The DD will enroll you on ATRRS and align you with a Master Black Belt (MBB).
- Attend the course.
- Select your team.
- Follow instructions from the course.
- Keep your chain of command and DD informed of course status until completion.

### ***Lessons Learned***

- Project sponsors and leaders play critical roles. Their training, support, and engagement are imperative.
- Project identification, selection, and chartering must be completed upfront, before considering belt selection and training (ie, the candidate needs to discuss and identify their project with their leaders before they can attend a course).
- Belt candidates need dedicated time during didactics and project execution to stay on task.
- Coaching is critical to project execution, and MBB/BB mentors must be engaged.
- Periodic meetings with working groups are essential to getting diverse input as well as viewpoints on the problem and how

to address it. Furthermore, working group selection is critical to ensuring there is a mix of personnel with experience of the problem as well as those without, who can provide a helpful perspective.

### ***Discussion and Way Ahead***

The MEDCOM alignment with DHA is well positioned for process improvement. As PAs get involved in making local improvements, their experiences and lessons learned should be fed through the DHA, MEDCOM, and MHS knowledge management process, and ultimately added to the DHA's knowledge base for process improvement, the Strategic Performance Improvement Data Repository.<sup>8</sup> Practitioners should share success stories, and nominate their successes for enterprise replication. Everyone should be an active part of the learning cycle.

## **Conclusion**

LSS and LDM are important concepts to know and practice for maintaining relevancy in health care organizations, in both military and civilian settings. Following initial and subsequent steps using LSS and LDM tools, and all process improvement tools available, will enable the transformation of health care organizations. PAs must use their existing resources and continue striving to improve their skill sets as they participate in the alignment of MEDCOM with DHA, while also earning education credit and additional skill identifiers to remain competitive.

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