

# Incorporating Lean Principles into Healthcare Design



Many healthcare organizations map the patient experience and focus on how patients perceive value-added and non-value-added activities, especially waiting. The longer a patient is in progress (e.g., longer clinical visit), the more resources – staff, space, and equipment – are required by that patient visit. Many organizations are now incorporating Lean techniques to improve the patient experience and the organization's bottom-line.

Lean is a process improvement system that seeks cultural transformation to eliminate “waste” from its processes. Lean was first employed in the manufacturing process and has spread to all forms of process transformation. While patients do not resemble manufacturing processes, the transformation of Lean principles into direct patient care has focused on streamlining the patient experience.



# Architectural Design

## Architectural Design Interacts with Lean on Two Levels: Cause and Effect

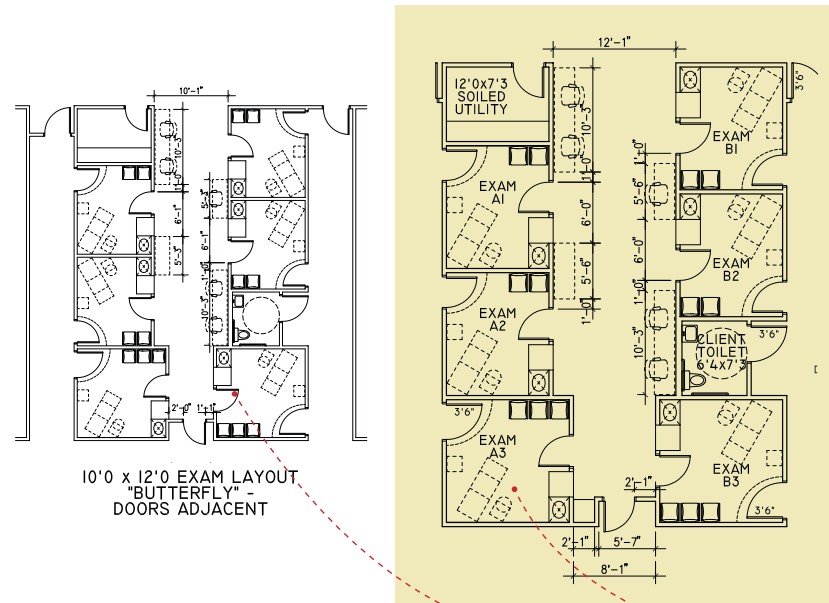
**Cause:** Areas of a building can compromise process improvement efforts.

- Supplies are located remote from point of use. Multi-floor locations of various functions can create long transport distances and elevator delays. Multiple room layouts defeat efforts in standardizing supplies.
- Nurse stations cannot be reconfigured to support new staffing models or new electronic interfaces.

In Lean-based design, a well-defined Future State drives the design process. Patient travel paths and stops are designed for patient convenience. In-process functions (such as x-raying an emergency patient), drive departmental locations and adjacencies. Room variability is eliminated to promote standardization in supplies and equipment, which are not only Lean efforts, but also affect patient safety.

Another architectural response to Lean is the understanding that Lean is continuous process improvement that will carry on after move-in. Design is moving away from built-in monuments and toward furniture solutions and identified soft spaces that can be easily changed when a process changes. **Flexibility to change is a key component of Lean.**

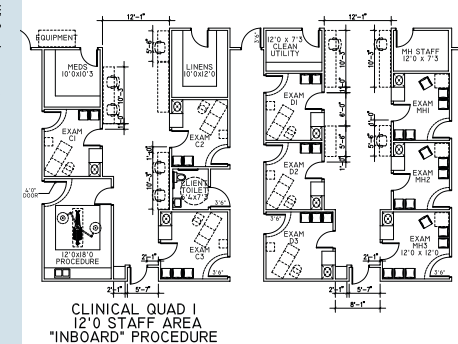
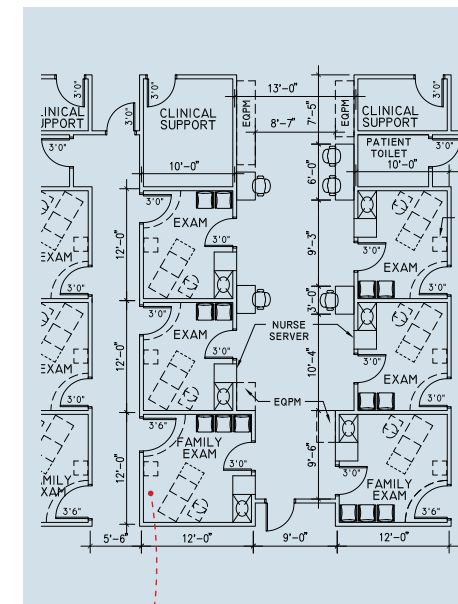
**Effect:** Flad clients who have successfully incorporated Lean into their culture have been able to affect space requirements for new construction. They have the confidence in their “No-Wait” models to significantly reduce waiting room space. By eliminating delays caused by waiting for imaging reports and lab results, they have significantly changed length of visit in clinics. By consistently reducing visit length, the number of exam rooms in new clinics be reduced.



During the Lean process comparison matrices and other tools to aid the decision making process are used.



**Efficiency and Flexibility.** The way in which a series of rooms is arranged will have a profound impact on the facility's efficiency. We will consider different grouping options and analyze which is the one that best fits your practice, the one that is most flexible and the one that has the lowest upfront costs.



## Lean-based Design Process



# Lean Implementation

## How Flad can support Lean implementation in building design

### Define the problem to be solved:

This is a critical leadership activity that shapes the entire process, defines success, and targets how the organization wants their culture to transform. Flad can assist in this process by facilitating the process, but ultimately, this must be a set of organization-generated goals.

### Identify the team / write the team charter:

A team would have a Lean Coach to outline activities and methodologies and assist in the development of the team charter to target that group's focus and goals. Other team members include leadership that can champion change and front-line workers who understand the work processes and failures at the detail level.

As the project dives deeper into processes and ancillary support functions, team members are added as needed to create multidisciplinary subteams to understand all aspects of the problem. This is an organization-led step. Flad is able to be a supporting team member, but the team must be comprised of front-line staff that is fully invested in the results.

### Map the Current State:

Mapping the *Current State* provides the working baseline for a Lean project. What is your patient flow? Where are the patients waiting? Why are they waiting? How many variations are there in the process? How much net time in the process do patients perceive as value-added; e.g., face-to-face time with a provider, versus non-value added time such as waiting six weeks to see a specialist.

To create a *Current State* map for a proposed entity, other entities will be mapped to paint a picture of generally accepted practice models within the organization. The team will build a *Current State* map for the new facility by maintaining current operational assumptions. Flad can assist in creating this combination *Current State* map that is derived from multiple facilities.

Flad's involvement at this step is as an analyst. We are adept at identifying when processes are responding to building or technology constraints as opposed to clinical goals.

We are able to analyze *Current State* maps and identify physical constraints that hinder process improvement such as multiple entry points, split locations within functions, or inadequate circulation.

### Map the Future State:

This step outlines the goals to be achieved by new processes and a new facility. This is an interactive discussion by the team with leadership maintaining the focus on the identified problem. When analyzing clinical processes, there are many solutions available, but do they accomplish the targeted goal?

The overlay of the *Future State* map on the *Current State* map identifies how each part of the process contributes to delays, variability, and defects. This provides the specific problems that subteams target for improvement and reengineering.

Flad's involvement at this step is an advisor to the team to provide knowledge of best practice, technology solutions, and most importantly, what are the space implications of certain solutions.

### User Groups and Space Programming:

Space programming provides direction to the design team, listing the room sizes and quantities that the project requires. It outlines major operational assumptions that affect configurations and adjacencies.

Traditionally, architectural firms facilitate User Group meetings to gather needed information.

In Lean lingo, the User Group would informally describe the *Current State*, without verification, and then describe the changes they thought they want in a new facility. The design firm offers best-practice solutions and problem-solving.

In a Lean-based design process, the *Future State* map would provide the starting point for the User Group meetings. Because the goals are well established by the first step in the Lean process, the users and the design team are clear on how the new environment will support the goals of the organization.

### Schematic Design, Design Development, and Construction Documents:

New software programs such as Layout IQ and various simulation programs can help the design team evaluate proposed layout. A common use of this process is finding the optimum level for distributed support of supplies and work areas.

### During Construction:

During the design and construction of a new facility, the Lean team remains active, implementing many parts of the *Future State* into the existing environment – testing and refining the new processes. The team establishes measurement methods and gathers data that can be continued in the new facility. The Lean team will begin planning the move-in and the operational startup of the new facility in accordance with the *Future State* map. The *Future State* map is a living document that requires continuous updates.



# 3 examples

## Healthcare Organizations committed to Lean

### 1 ThedaCare

The book, *On the Mend: Revolutionizing Healthcare to Save Lives and Transform the Industry* by John Toussaint, MD, former CEO of ThedaCare and Roger A. Gerard, PhD, its Chief Learning Officer, chronicles the cultural transformation of this healthcare organization as it incorporates Lean process improvement. One comment that is often made about ThedaCare's amazing transformation was that Dr. Toussaint, a MD CEO of a closed physicians' group, had a strong leadership leverage point to affect change than would a health system with independent community physicians.

### 2 Affinity Health System

Across the street from ThedaCare is their competitor, Affinity Health System, who has also deeply integrated Lean practice throughout their organization. It is very common to see Current State Flow Map and Future State Flow Maps posted in their clinical work areas as they are being worked on daily. As they have incorporated Lean processes in numerous clinical areas and significant change throughout, they now have the confidence to reduce program requirements in new construction. All their capital projects go through an internally led Lean event before starting architecturally led user group planning and design sessions.

### 3 Virginia Mason Medical Center

Virginia Mason Medical Center in Seattle, Washington, jump started its Lean implementation in 2002 with a mandatory executive trip to Japan to study the Toyota Production System. After developing the Virginia Mason Production System (VMPS) specifically for healthcare, they created the Virginia Mason Institute (VMI) to share their knowledge base with other healthcare organizations. <http://www.virginiamasoninstitute.org/>

### These three organizations...

#### ...utilize strong top-down leadership and bottom-up grassroots problem solving.

Both are essential. Leadership is needed to lead hard changes across the organization. Knowledge of detailed day-to-day operations is needed to target changes that matter.

Buy-in at all levels – physicians, nursing, housekeeping, access – is critical to making long-lasting meaningful change.

#### ...changed the “problem” to be solved.

Instead of defining problems in terms of reducing cost and improving throughput, both organizations redefined the problems in terms of the patient experience and outcomes. Improving the patient experience immediately streamlined the patient visit time. The net result is a higher utilization of exam and treatment rooms and decreased number of required rooms, but the focus is on the patient experience.

The focus is on what does the patient perceive as “value added” – waiting is not perceived as value-added by patients.

#### ...are in it for the long run.

ThedaCare initiated Lean in 2002 and is still evolving.

Affinity has been incorporating Lean process improvement for over six years and now has a Vice President of Performance Excellence overseeing a staff of Lean coaches within their planning department.

Virginia Mason Medical Center is in the middle of a major building project that is directly focused on the patient experience as described by their VMPS.

# mis-steps

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## 3 mis-steps to avoid.

Flad's experience of incorporating Lean into healthcare design has shown three negative effects of incomplete Lean transformation.

### 1 Not Enough Lean

Incorporating new methods and processes without sufficiently changing existing practices and habits.

Effect: Over-building space

### 2 Somebody Else's Lean

Implementing another institution's model without integrating the necessary operational changes and cultural transformation.

Effect: Under-building space

### 3 Big Bang Lean

Lean focused on the new building project or a single "event" and is not fully integrated into the culture of the organization.

Effect: The culture does not truly transform and reverts back to old practices. There is a disconnect between the culture and the new physical environment.

## Flad Architects

Flad Architects has earned a reputation for outstanding client service, fiscal responsibility, and design excellence over its 85-year history. Specializing in the planning and design of innovative science facilities for academic, healthcare, government, and corporate science and technology clients, Flad is nationally known and honored for its planning and design expertise. In addition to traditional architectural services, Flad provides strategic facility planning and programming, laboratory planning, interior design, landscape architecture, and structural engineering.