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**THE LEAN PRACTICE**

# Mastering the Art of Lean Ophthalmic Practice



AMERICAN ACADEMY™  
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# Mastering the Art of Lean Ophthalmic Practice

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# Introduction

Produced by the American Academy of Ophthalmic Executives (AAOE), this e-course book is a companion to the audio recording of *Mastering the Art of Lean Ophthalmic Practice*, the master class offered at the Academy's annual meeting in 2016. Together, they provide a set of innovative principles and implementation steps that you can use to make simple and effective changes to the way your ophthalmic practice is managed. These changes can significantly improve your office's efficiency, increase your bottom line and (perhaps most importantly) improve your patient satisfaction.

With the regulatory landscape shifting and payment networks becoming more narrow, practices are being challenged to do more with less. And new payment models place increased emphasis on patient satisfaction and improving quality in a cost-effective way. It's important to lead efforts that will have a meaningful impact for your practice and your patients. By implementing the lean methods in this course, you can successfully position your practice to thrive in the new era of value-based health care.

The course is directed by Aneesh Suneja, a lean management “black belt” with over 17 years of experience in applying lean strategies within medical practice settings. The audio recording will cover fundamental lean concepts and present case studies from ophthalmologists and their practice administrators. These case studies speak to the challenges faced in the ophthalmic practice and demonstrate how the application of lean management techniques helped resolve them.

This companion e-course book provides you with the hands-on tools needed to implement key lean strategies into your practice. It presents three foundational concepts — **value stream mapping**, **waste identification** and **thinking about the future state** — each of which is clarified with examples and followed by a step-by-step action plan. Helpful worksheets are included for use in your practice assessment. After finishing, you will be able to map your current processes accurately, identify value-added activities and root out waste. These findings will focus you and your care team on identifying actual roadblocks and empower you to implement solutions that fit your practice's needs. We recommend that you work through this book in sequential order, as each step builds upon the next.

Now, more than ever, going lean is **best practice** for ophthalmology. Start making efforts to improve the value of eye care you provide that will pay off for you and your patients!

Robert E. Wiggins Jr., MD, MHA

Academy Senior Secretary for Ophthalmic Practice

# Section 1: Three Foundational Lean Principles

## Key Point:

The three foundational lean principles are:

1. Value Stream Mapping
2. Waste Identification
3. Thinking About the Future State

## The Current State

Long wait times top the list of most patients' complaints. Due to the nature of the ophthalmic care process, patients in ophthalmology practices can have particularly long wait times. Technicians responsible for working up patients prior to physician consultations often work at their own pace, inadvertently creating a backlog of waiting patients who grow more and more dissatisfied as time passes. Patients may need additional imaging studies and other tests and procedures during the clinic visit, adding additional delays and another layer of unpredictability to the process. Clinic layouts can hamper team communication and scheduling systems can build delays into practice flow — again compounding the situation. Physicians, staff and patients alike become angry and frustrated by these inefficiencies.

## Lean in Ophthalmology

Lean is about carefully observing the entire care process and determining the sources of waste. Once we know what is causing patients to wait and clinics to run late, we can implement improvements that remove the root causes of waste. The goal is to create a relaxed, orderly clinic process that enables physicians to focus on patients, end clinics on time and spend less time on tasks that do not add value.

To achieve a calm, orderly state in the ophthalmic care process, you need to start with three foundational lean principles: **value stream mapping**, **waste identification**, and **thinking about the future state**. These principles help you diagnose the current state of your clinic and determine which improvements will have an immediate and positive impact on your team and your patients.

In the next section, we will introduce you to the first powerful lean tool — value stream mapping — which belongs in every practitioner's toolkit. Through value stream mapping, you will collect data based on direct observations of your patients' entire care process from check-in to check-out.

## Section 2: Value Stream Mapping

### Key Points:

- The value stream map is the 40,000-foot view of all the steps that take place in your ophthalmic care process.
- Mapping begins and ends with the patient.
- This high-level view enables you to accurately assess your current process and identify improvement priorities.

### What Is Value?

In lean management, we define **value** from the patient's point of view: What does the patient care about? When we think about this question from the patient's perspective, we can see that the patient is most concerned with outcomes and communication with the physician or care team. The rest of the care process — waiting to see a physician, walking from room to room, waiting for equipment availability, searching for needed information — is **waste** to the patient.

### The 40,000-Foot View

The roles in the ophthalmic care team — front desk, technicians and physicians — are specialized and seldom overlap. Very often, no one in the clinic has observed and understood the entire process from beginning to end, which can lead to multiple points of view about why problems occur.

Value stream mapping is a useful tool to see the entire process in action, learn how all the roles fit together and discover where the problems arise. It provides a 40,000-foot view of the steps your patients take in your ophthalmic care process. It also shows where physicians and technicians interact with the patient and where the patient must wait for the next step in the process. This high-level view is essential when 1) determining the state of the entire patient care process, 2) identifying improvement priorities and 3) ensuring that any changes have a positive effect on the entire process.

When you create your value stream map, you will follow a patient from check-in to check-out and record what you see. This firsthand observation is important: As a lean practitioner, you need to experience the process as the patient does and not rely on historical data or the testimony of the care team. An hour or two of patient observations will give you an entirely new perspective on your clinic process.

## Value Stream Mapping Metrics

Value stream mapping records three metrics: **process time**, **wait time** and **first quality time**, which are defined below.

<b>1. Process Time (PT)</b>	How long did it take for the patient to receive needed care in each step?
<b>2. Wait Time (WT)</b>	How long did the patient wait between steps ( <i>including walking time</i> )?
<b>3. First-Time Quality (FTQ)</b>	What is the percentage of instances in which a particular step was accomplished perfectly the first time, without issues or errors?

## Value Stream Mapping Symbols: The Process Box and Inverted Triangle

Record your observations using boxes to represent “processes” and inverted triangles to represent “wait times.” For each patient you observe, record the main process steps as boxes on your map. Check-in, photos and testing are examples of processes. A process box contains all the steps that happened *without stopping*. The process box for “Tech Workup” may, in fact, contain several tasks, but as long as the patient isn’t waiting for any of those tasks to occur, these multiple processes can all fall within the same box. An inverted triangle indicates a wait time for the patient.



## Exercise A: Step-by-Step Guide to Creating Your Value Stream Map

**STEP #1: Capture the high-level process steps on paper for each patient you observe.** Observe and record the process steps and associated times using a watch and pencil and paper. The process time is the amount of time the patient *actually* interacts with the physician or technician and does not include time spent waiting for the process step to occur. The sample value stream map below shows the process boxes in a retina clinic as well as times collected during a patient observation.

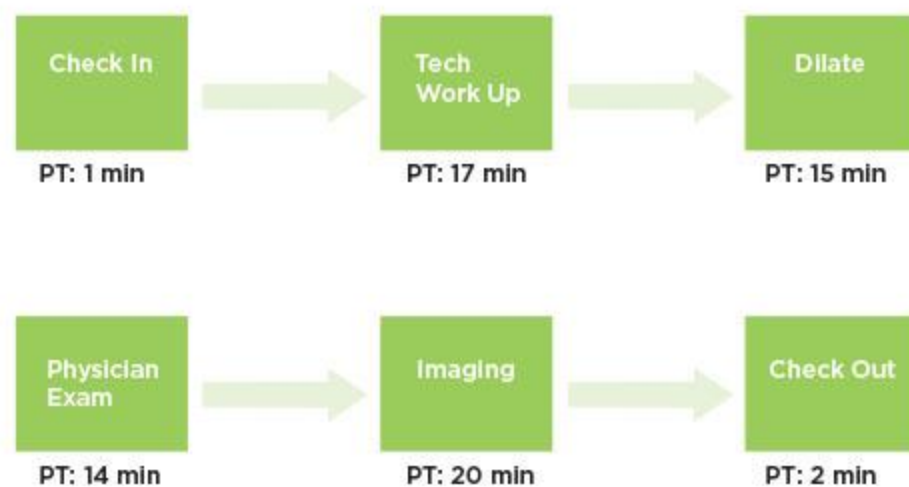


Figure 1. Value Stream Map — Step 1.

**STEP #2: Add the wait times that occur between each process step.** Draw them on the map as an inverted triangle. Adding the wait times as shown below emphasizes where the biggest improvement gains can be made. Lean management focuses your improvement efforts on the wait times, rather than on the process times, because the wait times are usually much longer and can yield much more dramatic improvements.



Figure 2. Value Stream Map — Step 2.

**STEP #3: The final metric to record is first time quality (FTQ).** FTQ is a measure of how frequently a step is performed correctly the first time — without errors, omissions or delays. For example, how often is the correct equipment and information available to the physician during a patient consultation? If the physician needs to leave the exam room to retrieve equipment or information 25% of the time, then that process step has a FTQ of 75%. On your value stream map, this can be an estimate; however, if you are able to complete a significant number of patient observations, record the observed FTQ.

When you have completed your map, use the FTQ percentage for each process box to calculate the overall FTQ. Overall FTQ measures how frequently a patient experience is ideal, or occurring without problems at any step of the process. To determine overall FTQ, multiply the FTQ percentages for each process box. In the example below,  $0.95 \times 0.75 \times 0.50 \times 0.75 \times 0.90 \times 0.80 = 19\%$  FTQ for the entire care process.

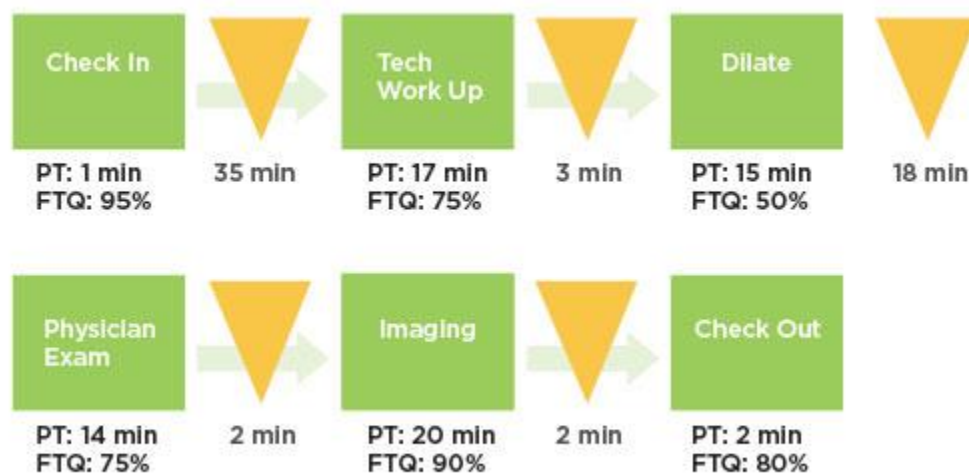


Figure 3. Value Stream Map — Step 3.

**STEP #4: Add up all your metrics to complete your value stream map.** Process times and wait times are added together to arrive at the *total visit length*. Compare the total visit length to the total process time to gauge the percentage of the visit spent in value-added activity. In our example, the total visit length (process times + wait times) is 129 minutes. Of that, 69 minutes is value-added process time, so the value-added time is 53% of the visit length.

Your completed value stream map should contain the following: 1) the final layout of the process boxes and wait symbols, 2) the duration of time associated with processes and wait times and 3) a final summary of data collection.



Figure 4. Value Stream Map — Step 4.

## Sample #1: Value Stream Map

The following value stream maps were created by ophthalmology teams working in a variety of clinical environments and provide examples of the level of detail and process information you should capture on your own map.



Figure 5. This pediatric/strabismus team created its value stream map based on several patient observations.

Note: A range of times are listed for several of the process steps and wait times.

## Sample #2: Value Stream Map

Simple tools — such as Post-it notes, flip charts and whiteboards — are extremely effective, easy to use and most likely already in your office supplies.

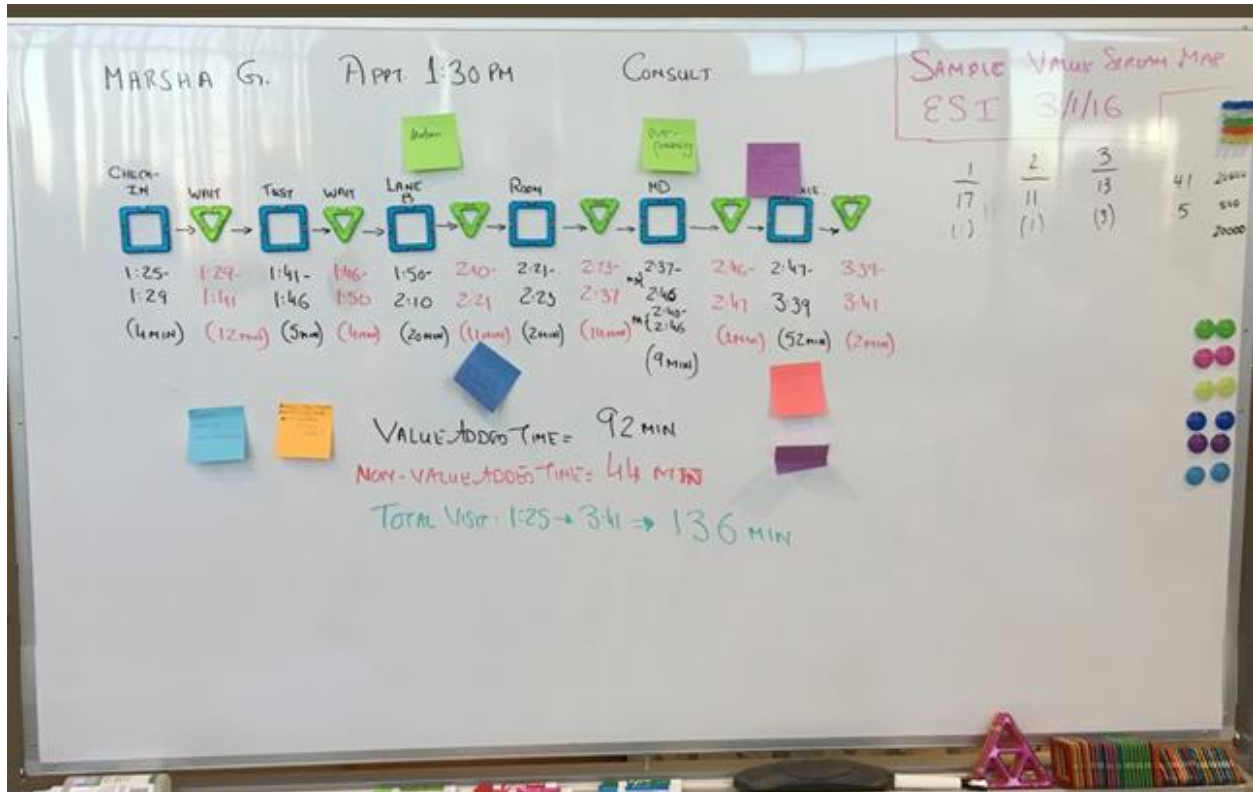


Figure 6. This comprehensive ophthalmology team created their value stream map based on the observation of a single patient.

Note: The clock times are recorded for each process step and the wait time in the process. This is a simple yet powerful way to conduct an observation.

## Action List: Key Steps for Creating Your Value Stream Map

**STEP #1:** Set aside at least 90 minutes during a representative clinic day for patient observations.

**STEP #2:** Let your clinic team know that you are conducting patient observations and why.

**STEP #3:** Select a patient to follow from beginning to end throughout the process. If time permits, select one patient from each type of patient that commonly visits your clinic.

**STEP #4:** Observe the patient moving through the clinic process. On your map, capture the high-level process steps in boxes and wait times in triangles. There is no need at this point to observe the patient during interactions with the care team, including the physician. Remember, since most processes contain more waste than value-added process time, your first priorities are to understand the process from beginning to end and to identify the places in your process where patients stop and wait.

**STEP #5:** Use a watch or stopwatch to capture process times and wait times at every step.

**STEP #6:** Calculate the first-time quality (FTQ) for every step of the process.

**STEP #7:** Add the process times and wait times to calculate the total visit length.

**STEP #8:** Divide the total process time by the total visit length to determine the value-added percentage for your process.

**STEP #9:** Share your value stream map and metrics with your physicians, care team and administrator.

## Section 3: Waste Identification

### Key Point:

Waste is any activity that takes up time, effort or space but does not provide value to the patient.

### What Is Waste?

In the prior section, you created a value stream map to understand where patients move through your clinic process and where they stop and wait. Every triangle on your map indicates a potential source of **waste** in the process. In the lean sense, waste is any activity that takes up time, effort or space but does not provide value to the patient. We know the waste is there because the value stream map tells us that the patient has stopped and is waiting. However, people closest to the process are often the ones who have the hardest time seeing the waste. They are too busy managing the care process for the patient to step back and identify sources of these problems.

### The 8 Wastes

Lean management categorizes waste into eight clearly visible categories:

1. Motion
2. Transportation
3. Inventory
4. Waiting
5. Defects
6. Over processing
7. Over production
8. Human Talent

But what does waste look like in an ophthalmology clinic?



## The 5 High-Impact Wastes in Ophthalmology

For ophthalmology, we will be focusing on five high-impact wastes — motion, inventory, waiting, over production and human talent. These are the most common types of waste you will see in your practice.

Let's take a closer look:



Figure 7. Motion.

**Motion** refers to *staff* footsteps (in contrast to transportation, which refers to *patient* footsteps). The waste of motion occurs any time a staff member walks unnecessarily to retrieve information, search for a physician or technician, fetch a surgery scheduler or find supplies or equipment. This type of motion indicates problems with facility layout, team roles and communication, and the stocking and location of supplies and equipment.



Figure 8. inventory.

**Inventory** is considered a source of waste under these three conditions: 1) when it is located too far away from where it is needed, 2) when it is poorly labeled, organized and stocked, and 3) when there is no system for management and reordering, which can lead to over- or understocked medications as well as obsolescence.

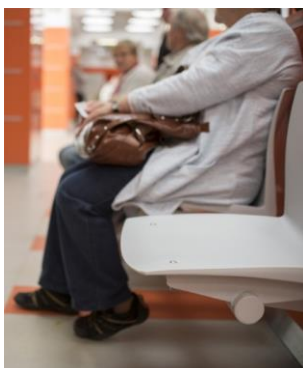


Figure 9. Waiting.

**Waiting** is a source of waste and includes patients waiting to check in or out, patients waiting for doctors and staff, and staff and doctors waiting for patients or for rooms to become available.



Figure 10. Over production.

**Over production** means that one step in the process produces more “inventory” than the next step can handle. For example, in ophthalmology, this often means that patients are backed up at a process step because too many patients were worked up and are now waiting for the physician or that a bottleneck has formed at another process step.



Figure 11. Human talent.

When **human talent** is wasted, the clinic loses the benefit of expert process input. Lean thinking teaches that the person doing the job is the one who knows it best. So, the first place to look for process improvement suggestions is the front-line care team. Failure to involve this team in process improvement efforts is more than just a waste of human talent; it is a sure way to derail your lean efforts.

## Exercise B: Conduct a Waste Walk

The waste walk is a tool to help you see waste in your process. Waste walks can be conducted after you have created the value stream map and are aware of where patients stop and wait in your process. Remember, the goal is not to make the value-added steps more efficient, but to identify and eliminate the wait times between those steps. Once you have mapped out those wait times, walk through the process again by visiting the places where the work is being performed, actively looking for the sources of waste. Record as many examples of waste as you can, using the form on the next page. Please note that we have included all eight wastes for a thorough waste walk.

**STEP #1:** Print a copy of the waste walk form on the next page.

**STEP #2:** With the waste walk form in hand, walk through your clinic's process. Record examples of as many categories of waste as possible.

**STEP #3:** Add these sources of waste to your value stream map.

**STEP #4:** Highlight potential areas for improvement.

**STEP #5:** Share and discuss your observations with your physician, staff and administrator team.

**STEP #6:** Work with the front-line team to identify one improvement to make based on the value stream map and waste walk exercise. Listen to the team's ideas and get their buy-in for whatever change is made.

**STEP #7:** Trial the change in the clinic and collect data on the results. Keep the changes that work and discard those that do not.

**STEP #8:** Celebrate early wins with the team to build excitement for lean, and begin to create a culture of continuous improvement.

## Worksheet #1: The 8 Wastes

The 8 Wastes	Your Observations of Waste
<b>1. Motion</b> <i>Some examples of motion waste:</i> <ul style="list-style-type: none"> <li>• Staff person's footsteps (e.g., the technician waiting, testing, doing an exam)</li> <li>• Physicians searching for technicians</li> <li>• Fetching surgery schedulers</li> <li>• Walking to communicate</li> <li>• Too many clicks</li> </ul>	
<b>2. Transportation</b> <i>Some examples of transportation waste:</i> <ul style="list-style-type: none"> <li>• The patient's footsteps</li> <li>• Moving supplies and information over long distances</li> <li>• Constant moving of equipment</li> </ul>	
<b>3. Inventory</b> <i>Some examples of inventory waste:</i> <ul style="list-style-type: none"> <li>• Supplies located too far away</li> <li>• Under-/overstocked medications</li> <li>• Poor organization</li> <li>• Poor labeling</li> </ul>	
<b>4. Waiting</b> <i>Some examples of waiting waste:</i> <ul style="list-style-type: none"> <li>• Patients waiting to check in or out</li> <li>• Patients waiting for the doctors or staff</li> <li>• Physicians waiting for patients to be ready</li> <li>• Staff waiting for rooms</li> </ul>	
<b>5. Defect</b> <i>Some examples of defect waste:</i> <ul style="list-style-type: none"> <li>• Wrong patient — wrong day</li> <li>• Poor-quality schedules</li> <li>• Errors in medication, care or billing</li> <li>• Incorrect spectacle prescriptions</li> </ul>	
<b>6. Over Processing</b> <i>Some examples of over processing waste:</i> <ul style="list-style-type: none"> <li>• Constant confusion</li> <li>• Variation in work causing work to be repeated</li> <li>• Undocumented processes</li> <li>• Solving the same problem continually</li> </ul>	
<b>7. Over Production</b> <i>Some examples of over production waste:</i> <ul style="list-style-type: none"> <li>• Too many patients to be worked up or tested</li> <li>• Too many patients waiting for the doctor</li> <li>• Bottleneck at check out</li> </ul>	
<b>8. Human Talent</b> <i>Some examples of human talent waste:</i> <ul style="list-style-type: none"> <li>• Front-line staff not tapped for ideas and problem solving</li> <li>• Not fully utilizing staff to complete portions of the patient encounter</li> <li>• One-size-fits-all approach</li> <li>• No process for continuous problem solving</li> </ul>	

## Section 4: Thinking About the Future State

### Key Points:

- In a lean sense, the ideal state for the care process is one of uninterrupted flow.
- A cross-trained and flexible team, working in a dedicated pod with one-patient-at-a-time scheduling, can eliminate most sources of waste.

### Flow Is Central to Lean

In a lean sense, the ideal state for the care process is one of flow — the patient does not stop moving from the beginning of the process to the end. If an ophthalmic clinic achieved flow, the patient would move continuously from check in to check out, and the value stream map would have only one process box.



Figure 12. The ideal state of flow in patient care.

In the actual clinical environment, however, there are many obstacles to achieving flow. Missing information or supplies, confusion about priorities, poor clinic layouts and inefficient scheduling can all interrupt flow, cause long wait times and late clinic end times and result in dissatisfied patients.



Figure 13. Impediments to flow in an ophthalmic practice.

Lean ophthalmic practitioners can use the tools of value stream mapping and waste identification to view their practice process objectively and begin to envision the future state. Envisioning the future state means diagnosing what's wrong with the current process and recognizing alternative ways to set up the ophthalmic practice.

## **The 4 Main Tools for Thinking About Your Future State**

For this discussion, we will focus on four main tools that have been tested and validated in comprehensive and subspecialty ophthalmology clinics. The goal is to acquaint you with these additional strategies for a lean clinic as you plan for your own future state.

### **Tool #1: Workload Balancing**

Very often, the ophthalmologist has the longest and most variable process time with the patient. When the physician consultation time exceeds the time the technician needs to work up another patient, it is tempting for the technician to “stay busy” by working up more patients as they become available. This creates an imbalance in the system and results in a built-in delay for the physician, as well as the whole clinic. Once the bottleneck is created, the technicians appear to be standing around idle while the physician has an insurmountable backlog of full exam rooms. Work imbalances lead to frustration, resentment and burnout, not to mention angry patients.

Solving a work imbalance means shifting some of the work content from one member of the team to another. If the average physician consultation is 10 minutes, but the technician needs only five minutes to work up the patient, then five minutes of work content can be shifted from the physician to the technician. In practice, some clinics have created a scribe role for technicians, which shifts some documentation work from the physician to the technician in order to prevent overproducing.

### **Tool #2: Schedules**

Sometimes, the bottleneck that gets the clinic behind schedule is not due to the technicians overproducing, but to the practice of scheduling patients in batches. If five patients are scheduled for the first-time slot in the clinic, it is likely that all five will be worked up at once and roomed for the physician, instantly creating a bottleneck that will set the clinic behind schedule for the entire clinic day. The addition of emergency and add-on patients will simply compound the delays.

The solution here is simple: Schedule one patient at a time. Doing so allows patients to flow through the process without bottlenecks. When the clinic doesn't get behind due to batches and bottlenecks, it is easier to accommodate emergencies and add-ons and still end the clinic on time.

### **Tool #3: Pods**

Many ophthalmology clinics are organized into departments in which members sit together in departmental workrooms. Technicians, physicians, photographers and schedulers might all have their

own workrooms where they are out of sight from one another. Physical organization of departments into separate units can result in work silos that do not communicate well with each other. People working in silos don't see the effects of workload imbalances or poor scheduling; they may know that the waiting room is full, but may not be aware of what is causing the delay. When people cannot see or communicate with each other, they only know their own part of the process, impeding efforts to improve the entire patient experience effectively.

The lean clinic works in pods rather than silos. Pods are natural, cross-functional teams made up of the physician, technicians, schedulers and photographers. They all share a workspace and a dedicated set of exam rooms and jointly manage patient flow. Pods reduce wastes of transportation and motion, help to balance workloads and increase communication.

#### **Tool #4: Visual Communication**

In a traditional clinic — with its inherent workload imbalances, departments and silos — there are no mechanisms to communicate patient status immediately or identify bottlenecks as they occur. Communication in traditional systems tends to be verbal and inconsistent, often taking place in hallways and other informal settings. Ineffectual communication makes it difficult to track individual patients and their needs and also reduces the ability of the care team to manage the overall clinic process.

A lean system makes communication visual. All team members can see the same information about the clinic process and where each patient is located. This can be done with a whiteboard or electronic tool that communicates the status of each patient in real time and triggers the next step of the process. When the care team can clearly see the entire clinic process, they can adjust the pace at certain steps to avoid backups or deploy cross-trained resources to alleviate bottlenecks as soon as they form. A cross-trained and flexible team, working in a dedicated pod with one-patient-at-a-time scheduling, can eliminate most sources of waste from the process. This reduces patient wait times dramatically and greatly improves both staff and patient satisfaction.

#### **Exercise C: Think About Your Future State**

To diagnose your process and begin thinking about the future state, observe staff and patients towards the end of the clinic at 11:30 a.m. and again at 4:00 p.m. Use the “Think About Your Future State” worksheet on the next page to capture your data.

## Worksheet #2: Think About Your Future State

Answer these questions:	11:30 a.m.	4:00 p.m.
1. How many patients are worked up and waiting for the doctor?		
2. How long will it take the physician to see all the patients who are worked up and waiting?		
3. What time then will the clinic end?		
4. What are the technicians doing during this time period?		
5. What are some alternative uses for the technicians' time to help the physician or patients through the process?		
Notes/Observations:		



# Summary

The three foundational lean principles presented here will enable you to see your clinic process with fresh eyes, diagnose the main sources of waste and take the first steps to make positive changes. When you map out your process, collect and share your process metrics, identify wastes and think about your future state, you are laying the groundwork for a lean transformation that will create a calm and efficient clinic environment.

Attendees at the *Mastering the Art of Lean Ophthalmic Practice* master class also took away the following insights:

- **Involve the front-line staff in the lean effort.**  
Staff buy-in for lean and for process improvement changes is critical: The team must be willing to make changes. One of the easiest ways to create commitment to lean is to involve the front-line team in process improvement efforts and use the results of the value stream mapping and waste walk exercises to identify “early wins.” Once the team experiences those early wins, their commitment to and excitement for the lean work will grow.
- **Observe the process firsthand.**  
Administrators, managers and physicians should observe the entire patient process and understand the steps involved before any changes are planned. When you invest the time in firsthand patient observations, you are demonstrating your commitment to understanding the process and improving it.
- **Create opportunities to train the staff in lean.**  
Lean training, as well as value stream mapping and waste walk exercises, can build the case for lean and begin to sow the seeds of culture change.
- **Share process information transparently.**  
As you begin with the steps outlined in this book, you will be collecting and analyzing a great deal of process information, all of which may be new to your clinic team. Information about how the process performs and how each individual team member impacts it should be shared with all staff. A team that shares a common understanding of relevant metrics can set common goals and work together to achieve them.

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## **The Lean Practice: Mastering the Art of Lean Ophthalmic Practice**

Produced by the American Academy of Ophthalmic Executives (AAOE), this e-course book is a companion to the on-demand recording of *Mastering the Art of Lean Ophthalmic Practice*. The course provides a set of innovative principles and implementation steps that can be used for making simple but powerful changes to your ophthalmic practice—changes that can significantly improve your office’s efficiency, increase your bottom line and (perhaps most importantly) improve patient satisfaction.

### **Topics include:**

- **Three Foundational Lean Principles**
- **Value Stream Mapping**
- **Waste Identification**
- **Thinking About the Future State**

### **About the American Academy of Ophthalmic Executives**

The American Academy of Ophthalmic Executives (AAOE), an affiliate of the American Academy of Ophthalmology, is the leading membership organization for ophthalmic practice management serving thousands of members. AAOE’s mission is to facilitate the business success of ophthalmic practices through accurate and up-to-date coding and practice management resources. Visit [aao.org/aaoe](http://aao.org/aaoe).