

APPLYING THE "Theory of Constraints" TO SOLVE YOUR PRACTICE'S Most Vexing Problem

What stands in the way of your practice achieving its goal?

Imagine a practice in which patients receive appointments without delay, the rooming process is efficient, handoffs are smooth, patients get the care they need, revenue is growing, and you get to leave the office on time at the end of the day.

Sound too good to be true? In most practices, there is something that stands in the way of this ideal state. That something is called a *constraint*.

Physicist Eli M. Goldratt developed the theory of constraints about 30 years ago as a scientific approach to improvement.¹ It proposes that every system has at least one constraint that is limiting the system from maximizing performance with respect to achieving its goals. The constraint can be a resource or equipment, the market, a policy or procedure, a measure, a person, etc. Focusing on even a single constraint can help an organization achieve massive system improvements.

**James F. Cox III, PhD,
Timothy M. Robinson, MD,
and Wendy Maxwell**

About the Authors

Dr. Cox is professor emeritus in the Management Department, Terry College of Business, University of Georgia, Athens. Dr. Robinson is a family physician and partner at Burke Primary Care in Morganton, N.C. Wendy Maxwell has been involved in the development and implementation of the theory of constraints for the past 14 years and is now using it with huisartsen (first-line doctors) in the Netherlands. Author disclosures: no relevant financial affiliations disclosed.

The constraint should be viewed as the leverage point for improving the whole system and achieving the practice's goal.

The constraint should not be viewed as bad; the constraint should be viewed as the leverage point for improving the whole system and achieving the practice's goal.

The theory of constraints has been used successfully in almost every type of organization and industry. It has even been used in health care, although less extensively. In the United Kingdom, it helped a hospital move from the bottom 10 to the top 10 among 500 hospitals ranked by

emergency response time after only a few months of implementation.² An oral surgeon's practice used the theory of constraints to go from break-even to a \$3.5 million profit.³

We recently applied the theory of constraints to a family medicine clinic with 10.5 providers (seven of them partners) in a small southern town to uncover and address its root problem. The results included an almost 40-percent increase in provider capacity and a 29-percent increase in revenue. (See "Project results.") The purpose of this article is to explain the steps we followed.

PROJECT RESULTS

The changes introduced in this practice allowed the providers participating in the project to fill the more than 20 percent vacant slots in their schedules (e.g., no appointment scheduled and no-shows) and add almost 20 percent more appointment slots with little or no capital investment or increase in operating expenses. This represents an almost 40 percent increase over previous provider capacities.

Participating providers	Initial appointment slots per day (20-percent vacant)	Added appointment slots
Provider 1	22	4
Provider 2	26	3
Provider 3	21	5
Provider 4	22	5

The practice also saw improvements in lead time (the time from the patient's call for an appointment until the scheduled appointment).

Appointment type	Lead times		
	Practice	Competitor 1	Competitor 2
Established patient	1 week	4 weeks	3-6 weeks
New patient	3-4 weeks	8 weeks	3-6 weeks
Established patient – acute	Same day	Within 24 hours	Within 24 hours
New patient – acute	Same day	24-72 hours	Within 72 hours

In the first full year after project implementation, the practice increased revenue 21 percent (comparing 2011 to a base year of 2008, selected as the recession officially started in December 2008). In 2012, the practice increased revenue 29 percent compared to 2008, most of which dropped to the bottom line. In 2013, the practice was down 1 percent in revenue because a provider/partner left the practice at the end of 2012 and has not yet been replaced.

Starting with the goal

If you look at a medical practice as a business (in a primarily fee-for-service environment), the most important process within the practice is patient flow because it is driven by the patient's needs and generates revenue. The most important interaction is between the primary provider and the patient. Therefore, having an effective patient-provider process is the practice's goal, and all parts of the practice should support that.

What stood in the way of this goal in the study practice was a deep conflict: On the one hand, the practice needed to be *efficient* and treat a large number of patients (both to pay the bills and to serve the patient community), which required limiting the time spent per patient. On the other hand, the practice needed to be *effective* and give each patient full attention and individualized care, which required increasing the

time spent per patient. This is a chronic conflict in most practices.

At the root of this conflict is where we identified the principal constraint, following what Goldratt called the “five focusing steps.”

Step 1: Identify the system constraint.

In this case, we identified that the strategic constraint should be the provider – the scarcest, most skilled, and most expensive resource. Planning for the constraint to be the provider simply means that the provider is the bottleneck and, if maximized, could bring the most value to the patient flow process and the doctor-patient interaction. Therefore, all aspects of patient flow needed to be realigned to support the provider and address the constraint. This was actually good news to the practice because identifying a constraint internal to the practice meant the solution was also internal.

Step 2: Decide how to exploit the system constraint.

This step is about identifying ways to increase the efficiency of the providers. The providers should do only provider work, not work that

a medical assistant, nurse, or other employee could do. If a task does not require the skills and training of a provider, then the provider (again, the most expensive and scarce resource in the practice) should not be performing it. The provider should process one patient, process the next patient, and so on. To allow this, staff must work to the top of their ability, eliminate interruptions for the provider, and answer questions for themselves as much as possible. If the provider can focus on treating the current patient, the results will be quality time spent with the patient and excellent health care in less time.

Step 3: Subordinate all else to the above decision.

This action is the toughest to implement across the practice but also the most rewarding for employees. Each employee must take a major part in redefining his or her job tasks and responsibilities based on supporting the provider. Traditional job descriptions might even need to be rewritten to adapt to this new recognition of the importance of the patient-provider interaction. Employees’ tasks should not be performed so that the employee alone

■ A constraint is any resource, policy, procedure, person, etc., that is the leverage point for the system to achieve its goals.

■ The study practice determined that the primary constraint should be the provider – the most expensive, most skilled, and scarcest resource.

■ To increase efficiency, each provider needed to do only provider work, not work that other staff could do.

ENGINES OF DISHARMONY AND HARMONY¹

Characteristics that cause disharmony and work against the achievement of the organization’s goal	Characteristics that cause harmony and support the achievement of the organization’s goal
1. Many employees do not know (i.e., they cannot clearly verbalize) how their work is essential to the organization.	1. Each employee knows exactly how he or she contributes to the organization and knows his or her contributions will be recognized.
2. Most employees do not know how their colleagues’ work is essential, or at least contributes, to the organization.	2. Each employee knows exactly how others contribute to the organization and knows their contributions will be recognized.
3. Employees are operating under organizational conflicts, such as conflicting policies or conflicts in resource allocation.	3. All rules are aligned with the goal and strategy of the organization.
4. There are gaps between individual responsibility and authority.	4. Gaps between individual responsibility and authority are systematically identified and removed.
5. Many employees are performing tasks for which a reason no longer exists; inertia is widespread.	5. Management has put into place a constraint-focused continuous improvement program and culture.

1. Cox JF, Boyd LH, Sullivan TT, Reid RA, Cartier B, eds. *The Theory of Constraints International Certification Organization Dictionary*, 2nd edition. New York: McGraw Hill; 2012:50-51.

Having everyone work together to support the practice's goal diminishes disharmony and activates harmony within the work environment.

is efficient but so that the provider is efficient and the patient visit runs smoothly. Check-in/check-out staff must ensure that the next patient in the appointment schedule is ready for processing. The medical assistant or nurse must ensure that patients are prepped and awaiting the provider and that exam rooms are fully equipped, with everything that is needed for that patient available to the provider. Buffer management techniques (such as midday huddles to quickly assess patient flow and implement interventions to protect provider time) can also help maintain effective utilization of the provider.

Step 4: Elevate the system constraint.

Elevate means to get more out of a resource. If steps 2 and 3 have been performed effectively and additional capacity is needed, then elevation is the only way to increase provider capacity. For example, the number of exam rooms in the practice was limiting one of the providers. Because she had only two exam rooms, she was often idle while waiting for another patient to be prepped or for lab results on a patient being treated. So, a nearby office was converted to a third exam room for \$5,000, and her increased productivity paid for the construction investment in the first five weeks.

A second example of elevating the constraint was the purchase of a second eye chart for the first floor to eliminate the queue for eye exams (required for an insured physical exam) and to improve patient flow for the floor's six providers, all of whom have their first appointments at 8 a.m. On the second floor, one provider had the assistants start processing his physical-exam patients 10 minutes earlier, thus eliminating the queue at the prep stations.

A third example of elevating the constraint involved a provider whose patient population was 80 percent female, many of whom required mammography appointments. When

the assistant would call the local mammography clinic to schedule an appointment for the patient, the provider would be idle as no patient was currently prepped and roomed. To solve this problem, the practice stopped setting up individual appointments itself and instead provided the mammography clinic with a daily listing of all patients that needed an appointment. The clinic would then call the patient directly to schedule the appointment. The clinic, patients, and the practice felt this procedure was a win-win-win solution.

To elevate the provider even more, an additional assistant/nurse was hired for two of the pods to take over nonessential provider tasks. As a result, an average of four appointment slots per day were added to each provider, thus paying for the new staff in just a few months.

Step 5: Do not let inertia become the new constraint.

If after completing the previous steps you find that the constraint has moved, go back to step one. At some point as a result of the improvement process or a change in the environment, the constraint may shift to another resource, policy, or procedure that requires attention. For example, as the summer season approaches, the demand for acute appointments diminishes significantly and the constraint moves to the market. Being aware of this seasonality, the practice can start proactively booking more physical exams to fill in the vacant appointment slots instead of just enduring the slower seasons. Added advantages to summer physical exams are that patients are less likely to have a cold, cough, flu, etc., and less likely to be taking medications for these and other acute illnesses.

A departure from traditional thinking

Our project can be summed up with two key concepts for improving the efficiency and

■ Staff members had to redefine their job tasks and responsibilities based on supporting the provider.

■ Additional changes were needed to get more out of the provider, such as adding an exam room to prevent idle time.

■ The practice saw an almost 40-percent increase in provider capacity and a 29-percent increase in revenue.

effectiveness of the patient-provider process: focus and flow. Specifically, the provider must be protected against interruptions so that he or she can fully focus on diagnosing and treating the current patient and providing excellent health care. Additionally, all support personnel must subordinate their efficiency to ensure provider efficiency and optimize patient flow.

■ Instead of focusing on individual performance, the practice focused on working together to support its goal.

■ Having a shared goal diminishes disharmony and enables ongoing improvement.

FURTHER READING

Cox JF, Robinson TM. The use of TOC in a medical appointment scheduling system for family practice. Video presented at: 10th Annual TOCICO International Conference; June 3-6, 2012; Chicago. <http://bit.ly/1zDZMzk>. Accessed July 31, 2014.

TOCICO health care portal. Theory of Constraints International Certification Organization website. <http://bit.ly/VDXY4>. Accessed July 31, 2014.

Knight A. *Pride and Joy*. Herts, England: Never Say I Know Publishers; 2014.

This is a departure from the traditional view of organizational effectiveness and efficiency where all employees seek to perform their tasks to the best of their abilities, minimizing their time per task, as if they have no impact on the rest of the practice. Instead, having everyone work together to support the practice's goal diminishes disharmony and activates harmony within the work environment. (See "Engines of disharmony and harmony," page 20.) This, in turn, enables ongoing improvement. **FPM**

1. Goldratt EM, Cox J. *The Goal: A Process of Ongoing Improvement*, 20th Anniversary Edition. Great Barrington, MA: North River Press; 2004.
2. Knight A. Fifteen year progress report on achieving breakthroughs in health and social care using the theory of constraints. Presented at: TOCICO International Conference; 2011; Palisades, NY.
3. Wadhwa G. Viable vision: achievable in healthcare. Presented at: TOCICO International Conference; 2007; Las Vegas.

Send comments to fpmedit@aafp.org, or add your comments to the article at <http://www.aafp.org/fpm/2014/0900/p18.html>.

AAFP's "Five Key Metrics for Financial Success"

Master your business. Get back to your patients.

The AAFP's free online educational series, "**Five Key Metrics for Financial Success in Your Practice**," is designed to provide targeted financial training to practicing family physicians operating as small business owners.

These five- to seven- minute, easily digestible modules will help you understand how to:

- Evaluate your practice's revenue cycle
- Better forecast income and expenses, and
- Address issues preventing timely reimbursement.

Let the AAFP help you master the business side of your practice, so you can get back to your real job: Providing quality care to your patients.

View the tutorials today:
aafp.org/5keymetrics

