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The Virginia Mason Production System What it Is, and Why it's Better for Your Patients

This article introduces a series on the Virginia Mason Production System, a nationally recognized management methodology based on the Toyota Production System.

Six years ago, Virginia Mason embarked on an ambitious, system wide program to change the way it delivers health care and in the process improve patient safety and quality. It did so by adopting the basic tenets of the Toyota Production System, calling it the Virginia Mason Production system or VMPS.



Gary S. Aplan, MD
Chairman and CEO

The Virginia Mason Production System is the Toyota Production System applied to health care, says Gary S. Aplan, MD, Chairman and CEO. It is a management philosophy or system focused on

the elimination of waste in performing work. We have found that health care is full of waste, whether it is putting a caller on hold or having a patient wait in an exam room.

While some medical centers have initiated projects using the Toyota Production System, Virginia Mason is the first to integrate the Toyota management philosophy throughout its entire system.

To date, VM has undertaken eight study missions to Japan led by Dr. Aplan

and other senior leaders and has completed more than 100 rapid process improvement workshops (RPIWs) that have redesigned how physicians and front line staff are performing their work. With its vision to be the Quality Leader and with an emphasis on patient safety, VM is implementing its production system in every area of the health system.

Production in Health Care

How does the term production apply to health care? Patients of course are not cars. Yet both manufacturing and health care are filled with complex production processes.

In health care these processes include admitting a patient, having a clinic visit or having surgery, says Dr. Aplan.

These processes should embrace the concepts of quality, safety, customer satisfaction, staff satisfaction and cost effectiveness. The Virginia Mason Production System is all about optimizing each of these on behalf of our patients.

Pillars of VMPS

Virginia Mason incorporated two key concepts from Toyota that form the pillars of its management system: just in time production or producing and delivering only what is needed when and where it is needed anything else is deemed waste, and jidoka or identifying defects in production and stopping the line to fix them.

Shortly after its first trip to Japan, Virginia Mason adopted its own jidoka called the Patient Safety Alert system

or PSA. PSAs encourage employees to stop the line wherever they are to fix safety concerns. In 2007, for example, VM employees instituted approximately 100 PSAs per month. In 2008, they initiated 200 per month. By June 2009, 1,000 Patient Safety Alerts had been instigated by physicians and staff since the system's inception.

The PSA system puts in place a response to reporting by senior leaders, department chiefs and vice presidents to begin root cause analysis and mistake proofing to prevent recurrence, Dr. Aplan says.

The goal is to deliver a product or service that is defect free.

If every employee at Toyota has the capability to stop the production line, then every one of our employees also should be a safety inspector, he adds. The goal is to deliver a product or service that is defect free.

The Value Stream Map:

How Processes Are Identified

When one thinks about a large metropolitan hospital and clinic and outlying satellite clinics with literally thousands of work processes in place every day, how and where does one begin to institute change

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CARING FOR YOUR PATIENTS IS A PRIVILEGE

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EARLY SUCCESSSES TAKE MEDICINE IN A NEW DIRECTION

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MEET VM'S NEW CANCER INSTITUTE MEDICAL DIRECTOR

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Early Successes Take Medicine in a New Direction

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you prosperous and happy with the arrival of

We appreciate your partnership in , and as we plan our goals for the Regional Clinicians Program, we start with the valuable feedback we have received from you.



Douglas D. Backous, MD, FACS

We consider taking care of patients sent to Virginia Mason for specialty care a privilege. An important question for our institution to ask is, How are we helping our regional partners to be stronger contributors in their local communities by working with us

In the upcoming months, the Regional Clinicians Program will focus efforts to clearly understand the most safe and efficient way to transfer care back to community based providers after interventions are completed at our hospital.

We will be working with the tools of the Virginia Mason Production System to create standard work for communicating continuity of care in ways which do not create unnecessary work for you to obtain discharge records, locate patients or schedule follow up appointments at your facility or back at Virginia Mason.

This effort, coupled with our new online physician portal to be fully launched soon , will ensure you never lose track of your patients while in the care of our team of professionals in Seattle.

We look forward to working with you this year and appreciate you as a partner in Team Medicine. Please feel free to call me with your thoughts at 6 6.

Doug D. Backous, MD, FACS
Otolaryngology
Medical Director,
Regional Clinicians Program
Virginia Mason Medical Center

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fewer workers receive health care benefits from their employers. Half of personal bankruptcy in the U.S. is related to health care costs. And, higher prices do not necessarily mean better care. Virginia Mason has launched the Center for Health Care Solutions to address these problems. The center's goal is to improve care quality, lower costs and ease access to care by working together with large purchasers of care.

Employers Have Common Concerns

In , brought together over issues of cost and access, VM heard for the first time what employers were identifying as their four most pressing health care concerns: back pain, migraine headaches, chest pain and gastroesophageal reflux disease GERD . These conditions were costing them millions of dollars each year in medical claims and lost productivity.

In one example, Starbucks, a self insured employer that uses Aetna's physician and hospital networks, identified back pain as its top priority. In subsequent meetings, Starbucks told Virginia Mason exactly what it wanted: It asked VM to treat its employees on the same day they called for an appointment to help them return to work sooner, and it wanted a lower price for the care they receive.

Sitting in on those meetings was the first time our physicians had been in a room with a purchaser of their care, says Robert Mecklenburg, MD, co director of the new center. Treating back pain may be unglamorous on our side, but it is what our customers want, and we are putting the customer first. Our physicians also did not understand the cost to employers of having patients wait two weeks to see them, adds Dr. Mecklenburg.

Creating the Value Stream

Starting with back pain, Virginia Mason began reviewing the literature and reassessing the way it delivered care using tools of the Virginia Mason Production System VMPS . Waste in the system was quickly identified.

Previously, when patients with back pain called for an appointment, they faced waits as long as days. Once inside VM, the patient had an initial meeting with a physician, then might also see a specialist, have x-rays and an MRI, have medications prescribed, have a follow



Robert Mecklenburg, MD
Presenting at the Lundberg Conference

up visit with the original physician, then be sent to physical therapy, all over the course of several months.

As a result of its VMPS work, VM instituted an evidence based pathway for back pain treatment that delivers reproducible, reliable and consistent best care, says Dr. Mecklenburg. The new model is based on seeing a physical therapist first, which the medical evidence shows us is what works best for the patient. A physician back specialist reviews the plan with the physical therapist, therapy begins the same day of the appointment and the patient is shown how to relax the back muscles.

Adds Dr. Mecklenburg: Patients do not usually need pain meds once they know how to manage discomfort without them. This type of care is inexpensive, fast and effective. We've found that percent of back pain cases are uncomplicated. But in instances in which a more serious problem is present, those patients also will be seen on the same day, this time first by a physician back specialist.

VM's new back pain treatment model, or value stream in VMPS terms, was implemented within three months of

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Mapping out every process involved in completing the work. Each cycle of work within the process is drawn as a box on a long sheet of white paper with time assigned to each one. The paper is then taped up on a wall so that staff members can see a hard copy of what they do.

It is within this flow of work that problem areas can be seen and improved upon through RPIWs, says Linda Hebish, administrator of VM's Kaizen Promotion Office, a department at VM with particular expertise in the VMPS management philosophy.

How RPIWs Benefit Patients

Seeing work as it is being performed and making necessary changes to improve flow underlie the rapid process improvement workshop process. It involves going to the gamba, the shop floor, says Dr. Aplan, and seeing work in progress. In health care the shop floor is the ICU, the hospital floor, patient rooms or central supply. It allows you to see the work as it exists.

RPIWs are conducted over five working days the rapid part, and change is implemented the following Monday.

Then there are 6 and 7 day audits to determine if we are holding the gains, Dr. Aplan says. The concept of kaizen is continuous incremental improvement: hold the gains, audit the gains, work on improving the work further. It is better to see percent

ent today than percent ent sometime in the future. haps have helped VM identify waste in time, space, and supplies, and their outcome of improved efficiency is creating better patient access and safety, and better quality of care.

GI Endoscopy: Standardizing Procedure Rooms for Smooth Patient Flow

Seven years ago, GI Endoscopy within VM's Digestive Disease Institute was one of the first clinic areas to undergo the RPIW process. Recognizing that one of its obstacles was the bottleneck caused in the admit recovery area for patients undergoing many different GI procedures a situation not unique to any one medical center the section set out to tackle the problem with the help of VM's Kaizen Promotion Office.

First, we performed a 5S in all of our procedure rooms by standardizing supplies and discarding or recycling equipment that was no longer in use, says Patti Wilbur, RN, director of GI Endoscopy. Note: 5S is a Toyota Production System principle for organizing work space. It stands for sort, simplify, sweep, standardize and self discipline.

Next, the group focused on the nurses' responsibilities in the procedure room. Through the RPIW process of looking at staff movement during work and charting it on a page, the section saw how much time nurses were taking to get patients into and out of procedure rooms as well as the setting up and tearing down of each room.

The primary responsibility of our nurses is the care of our patients, Wilbur adds. But they also were setting up the rooms, traveling a distance from the room to obtain the medications needed for the procedure rooms, and then cleaning the rooms post procedure and setting up for the next patient.

Wilbur says they looked at developing a system that better aligned its staff's skills with its tasks. One solution was to bring in Environmental Services technicians who were being displaced in the OR because of efficiencies realized during some of its own RPIWs in Virginia Mason instituted a program of no layoffs while implementing its VMPS.

Now the techs prepare and clean the rooms, Wilbur says, and also assemble what we call an eternal set up kit that has supplies ready to go into the room. Our nurses, once again, can focus only on the patients.

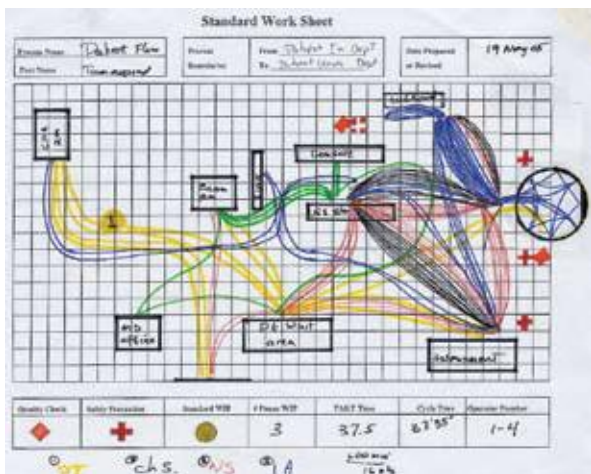
But the bottleneck in the admit recovery area remained, so GI had another RPIW to continue looking at this process.

The GI section had looked at building another procedure room, but when we began to look at our space we saw that we had two rooms open for flexible sigmoidoscopies, a procedure we rarely do today, Wilbur says.

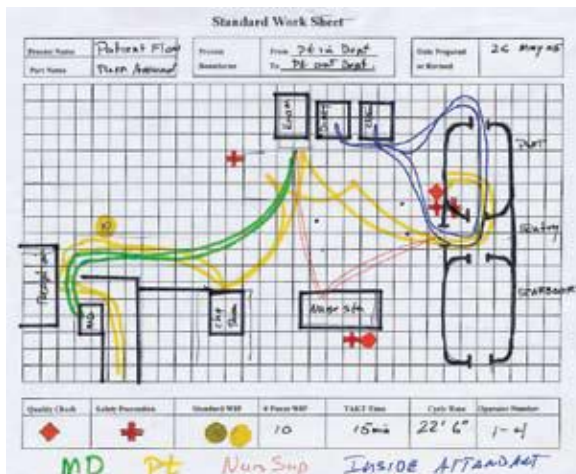
Again, we were looking for alignment in our processes that would give us a steady flow of patients through admit and recovery.

During its RPIW, the section saw that it could separate admit patients from

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An example of a Rapid Process Improvement Project RPIW spaghetti chart in the Center for Hyperbaric Medicine showing staff movement or footsteps taken while caring for patients. The colored lines represent different providers.



Staff movement following completion of the RPIW that resulted in more efficient delivery of care.

New Specialty Providers



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and surgical treatment of
erectile dysfunction



Grand Rounds Opportunities

Grand Rounds are held each Friday
from : to : a.m., September
through mid June. Ground Rounds
are open to the public and are held
in Volney Richmond Auditorium,
located on Level of Lindeman
Pavilion, Terry Ave., Seattle.

Upcoming topics include:

Feb.

Quality and Change Management,
Educational Theory and Social
Learning

Roger W. Bush, MD, FACP
General Internal Medicine
Hospital Medicine Service
Virginia Mason Medical Center

Feb.

Shared Decision Making: At the
Confluence of Physician and Patient
Expertise

Shelly T. aruna, MD
Research Consultant
Benaroya Research Institute
Virginia Mason Department of Surgery
Section of General and Thoracic Surgery

Feb.

Obscure Gastrointestinal Bleeding
: An Update

Andrew Ross, MD
Digestive Disease Institute
Section of Gastroenterology
Virginia Mason Medical Center

March

Patient Safety Physician Boundaries
imberly McLaren, MD

March

Otology Otolaryngology
Treatment Update

Douglas D. Backous, MD, FACS
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For more information, or to be
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Rounds mailing list, please call
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Virginia Mason Medical Center

The Regional Clinician Service Center is a department within Virginia Mason that manages the entire referral process for regional clinicians.

Some of the ways we can help include:

- Expediting the referral process
- Streamlining hospital admissions
- Facilitating access to providers and services
- Providing clinical information about patient visits
- Sharing information about Virginia Mason
- Resolving referral issues

Please contact our specialists by calling:

Fax: (800) 641-9002
 E-mail: referral@vmmc.org
 Hours: Monday through Friday, 8 a.m. to 5 p.m.



Continued from Page
 patients. It utilized the two floor for dedicated admit space process, increased the space of patients.

In the past we stopped taking patients into the procedure rooms until more patients were out of the recovery room. We have been able to increase our volumes due to the flow of patients from admit through the recovery process.

Previously, patients calling to schedule a colonoscopy had to wait as long as four months. Today, Wilbur says, patients are scheduled the same day or the following day, depending on their preparation. Over the past seven years, GI Endoscopy has undergone RPIWs to improve its processes.

The VMPS is about looking at current processes and bringing the staff together to look at what changes would make them better for patient care, she adds. Overall, putting standardization in place has done wonders for our journey and it is safer for our patients.

Early Successes

Continued from Page

the initial meeting with Starbucks and Aetna. From the beginning, it decreased patient waiting time from days to one day and has eliminated unnecessary MRI tests. No work loss occurred in percent of patients treated, and no medication was needed in percent of cases. The cost to purchasers decreased by more than percent. Patient satisfaction rose to percent.

Product, Price, Quality on the Table
 Virginia Mason also began telling its purchasers how much they would be charged for the care their employees received. When you buy a product in any other business, what you buy and its quality and price are known to you, says Dr. Mecklenburg. In health care, we hold the product and its price under the counter. Our customers have no idea of what care they will receive or the cost.

VMPS Results Over Six Years

Since implementing its production system in , Virginia Mason has saved from to million in budgeted capital. RPIWs undertaken throughout the medical center have reduced staff walking distance by percent miles, and the travel distance of supplies by percent miles. Inventory has been cut in half. Lead time has decreased by percent or more than two years. Additionally, there has been a percent gain in productivity, or the equivalent of full time employees. More importantly, these changes taken together have translated to better, safer and more efficient patient care.

For More Information

VMPS has been highlighted in articles in the Wall Street Journal and The New York Times, and was selected as a case study at Harvard Business School. For additional information about the Virginia Mason Production System, visit VirginiaMason.org.

[New time Nursing cells](#) [Changing how hospital nurses care for their patients.](#)

But by being so efficient and eliminating unnecessary tests, VM began to lose money. What once was profitable now put VM in the red. Because of the collaborative nature of their working group, Starbucks asked Aetna to increase payments to VM for physical therapy visits. The insurer agreed to do so, offsetting financial losses for VM.

Satisfied Patients

In addition to same day access and delivering best practices in medicine, all at a price that is affordable and transparent, VM is focused on getting the patient back to work or back into the community in a timely manner and have a patient satisfaction rating over percent, says Dr. Mecklenburg. The bottom line is that we are providing better, faster, more affordable medical care. This is our goal.

A few minutes with ...



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Delores Jones Cancer Institute. In addition, Dr. Corman is a clinical associate professor of urology at the University of Washington School of Medicine.

What opportunities lie ahead for the Cancer Institute

Virginia Mason has a long tradition of excellence in the management of complex cancer patients. With our hospital's planned growth, our cancer institute has an opportunity to expand services in medical, radiation and surgical oncology.

This growth includes developing new technologies for targeted therapy, expanding opportunities in multimodal care and in initiating programs in cancer survivorship, cancer surveillance and cancer screening.

What changes are you seeing in cancer treatment

Cancer care is one of the most dynamic

medicine. As translational develops, we anticipate reliance upon target-specific therapies as opposed to cytotoxic treatments.

Further, as our cancer population ages, the complexity of the disease increases. Such complexity is met with innovation in cancer care. With advances in cancer therapy, we anticipate that cancer will increasingly be transformed from an acute condition to a chronic condition in many patients. Genetic testing will play an increasingly important role in cancer care in the coming years as gene expression profiling will drive cancer treatment decisions.

What can the referring clinician expect when sending their patient to VM Referring clinicians should expect excellence in access, communication and follow up from their VM colleagues.

We encourage referring clinicians to use our resources. We have some of the

region's top thought leaders with whom to confer.

What progress do you expect for the way you treat patients in the future

We have the ability to offer our patients integrated, comprehensive, multidisciplinary care led by national leaders in medical, radiation and surgical oncology. Through our Cancer Institute, services such as genetic counseling, social services and research support networks are available and unparalleled in the Pacific Northwest.



John M. Corman, MD

The Floyd Delores Jones Cancer Institute is accredited with commendation by the American College of Surgeons ACOS Commission on Cancer. The cancer institute received the highest possible rating from the commission, with commendation in seven out of eight categories in which the ACOS bases its evaluation.

About Virginia Mason

Established in 1920, Virginia Mason began as an 80-bed hospital with six physician offices. It was named after the daughters of James Tate Mason, MD, and John M. Blackford, MD, who co-founded the Virginia Mason clinic with radiologist Maurice Dwyer, MD. The founders' vision was to provide a single place where patients could receive comprehensive medical care.

Today Virginia Mason is a not-for-profit comprehensive regional health care system that combines a primary and specialty care group practice of more than 400 physicians with a 336-bed acute care hospital in Seattle.

In addition, Virginia Mason has a network of clinics located throughout the Puget Sound area and manages Bailey-Boushays House, a nursing residence and adult day health program for people living with HIV and AIDS. Virginia Mason also has an internationally recognized research center, Benaroya Research Institute at Virginia Mason.

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