

Seeking Perfection in Healthcare: Applying the Toyota Production System to Medicine Gary S. Kaplan, MD

Lehigh Valley Business Coalition on Healthcare May 8, 2015

Virginia Mason Medical Center

- Integrated health care system
- 501(c)3 not-for-profit
- 336-bed hospital
- Nine locations
- 500 physicians
- 6,000 employees
- Graduate Medical Education
- Research Institute
- Foundation
- Virginia Mason Institute



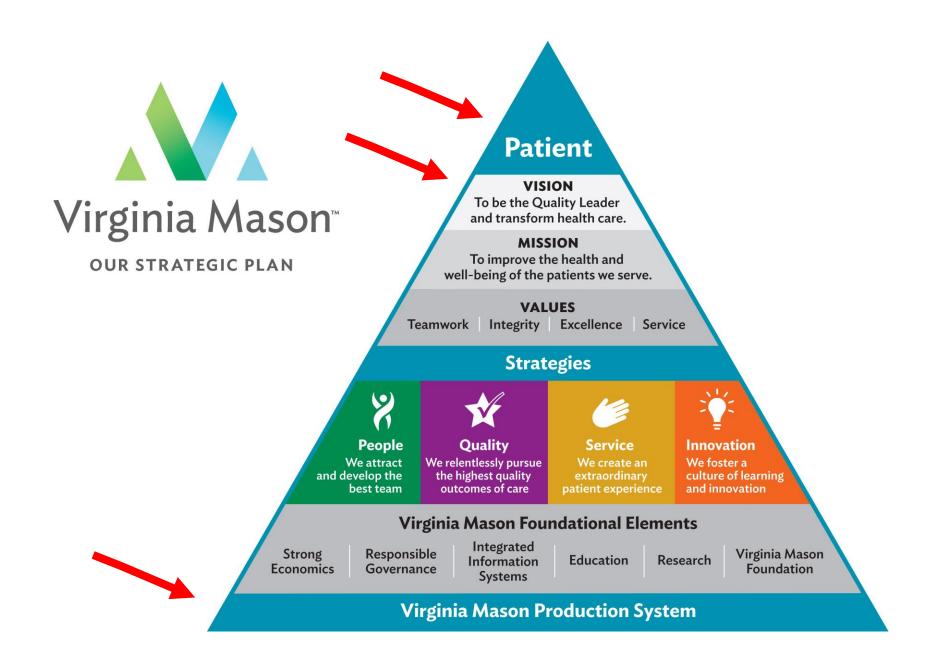
The Challenge of Healthcare

- Impact on individuals.....100% defect
- Cost of poor quality.....Billions of dollars
- Cost of healthcare to those who pay.....Unaffordable
- Access......Millions
- Morale of workers.....Unreliable systems

The March 16, 2003 edition of The New York Times Magazine front cover reads, "Half of what doctors know is wrong."

The lead story is titled "The Biggest Mistake of Their Lives" and chronicles four survivors of medical errors.

The article goes on to say that in 2003, as many as 98,000 people in the United States will die as a result of medical errors.



Why is Change So Hard?

Culture

Lack of Shared Vision

Misaligned Expectations

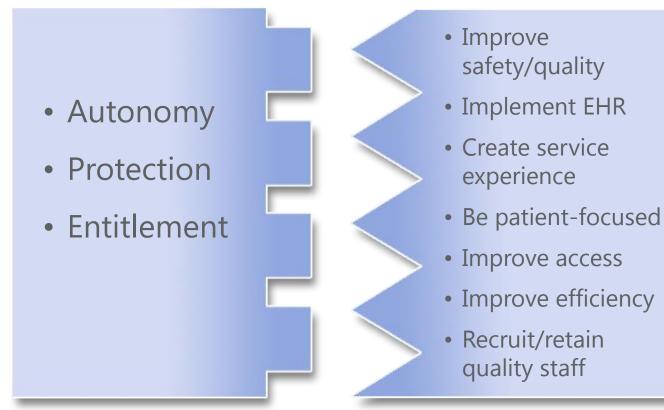
No Urgency

Ineffective Leadership

Clash of "Promise" and Imperatives

Traditional "Promise" Legacy Expectations

Imperatives



Virginia Mason Medical Center Physician Compact

Organization's Responsibilities

Foster Excellence

- · Recruit and retain superior physicians and staff
- Support career development and professional satisfaction
- Acknowledge contributions to patient care and the organization
- · Create opportunities to participate in or support research

Listen and Communicate

- Share information regarding strategic intent, organizational priorities and business decisions
- · Offer opportunities for constructive dialogue
- Provide regular, written evaluation and feedback

Educate

- Support and facilitate teaching, GME and CME
- Provide information and tools necessary to improve practice

Reward

- Provide clear compensation with internal and market consistency, aligned with organizational goals
- · Create an environment that supports teams and individuals

Lead

Manage and lead organization with integrity and accountability

Physician's Responsibilities

Focus on Patients

- Practice state of the art, quality medicine
- · Encourage patient involvement in care and treatment decisions
- · Achieve and maintain optimal patient access
- Insist on seamless service

Collaborate on Care Delivery

- · Include staff, physicians, and management on team
- Treat all members with respect
- · Demonstrate the highest levels of ethical and professional conduct
- Behave in a manner consistent with group goals
- Participate in or support teaching

Listen and Communicate

- · Communicate clinical information in clear, timely manner
- Request information, resources needed to provide care consistent with VM goals
- Provide and accept feedback

Take Ownership

- Implement VM-accepted clinical standards of care
- · Participate in and support group decisions
- · Focus on the economic aspects of our practice

Change

- · Embrace innovation and continuous improvement
- · Participate in necessary organizational change

Aligned Expectations

Physician Compact

VIRGINIA MASON MEDICAL CENTER PHYSICIAN COMPACT

Physician's Responsibilities

Collaborate on Care Delivery

conduct

Take Ownership

Practice state of the art, quality medicine

Treat all members with respect

Participate in or support teaching

Provide and accept feedback

Demonstrate the highest levels of ethical and professional

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Behave in a manner consistent with group goals

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MEDICINE

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 Listen and Communicate
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- Create an environment that supports teams and individuals
- Lead Manage and lead organization with integrity and accountability

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Board Compact

Deard Marshar's Deenensibilities

VIRGINIA MASON MEDICAL CENTER BOARD MEMBER COMPACT -----

Organization's Deeneneikilities

Organization's Responsibilities	Board Member's Responsibilities
Foster Excellence Ficiliars the recruitment and retention of superior board members Forwisk as proceed for regularizations withoution and Aedback through Soport pervenues excellance with adaptation through a second annubers Soport pervenues excellance with adaptation board annubers Usteen and Communicate Game formation expedition through a second proteins and boatese decisions Fageor regularity on subgenerativities of strategic plan and achievement of specific board objective Disclose to and disclose to strategic plan and achievement of specific board objective Disclose to and disclose accessory for information disclose taking Possible assersible to successory for informated decision Possible assersible to successory for informated decision unking unificativity in adaptate of board memory.	Know the Organization Kasw the organization Kasw the organization subset, propertus, service, transformation ad need, and the Nethol System's need of
Educate Provide information and noticity accuracy to keep nambers informated and the second provide the second provide the second provided Provide school standard and remaining opportunities in the second provided provided provided provided provided both members both members short organization, its textures and in guidang documents Control of the second provided	Tabe Ownership A stread usering: A consistentify equivalent to total and consisting emerings A consistent with were an another and consistence I begins for participants in, and support group decisions Understand and precisions in approving exact and longer range financial Make as seamly periods financial constructions on the organization, according to periodal instants Source to board commerce and financial Source to board commerce and finances Proven taxovitations and constrained therefore Change Proven taxovitations and constrained therefore Change Proven taxovitations and constrained therefore Change

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Leader Compact

Organization Responsibilities	Leader Responsibilities				
Foster Excellence	Foous on Patients				
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leadership compact final.doc.approved 10.21.03

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The VMMC Quality Equation

$Q = A \times (O + S)$ W

- Q: Quality
- A: Appropriateness
- O: Outcomes
- S: Service
- W: Waste

Finding a Method



Seeing with our Eyes Japan 2002

第37回新技術現場改善 37TH SHINGIJUTSU GEMBA KAIZEN

Hitachi Air Conditioning

Team Leader Kaplan reviewing the flow of the process with

Drs. Jacobs and Glenn





What we learned

How are air conditioners, cars, looms and airplanes like health care?

- Every manufacturing element is a production processes
- Health care is a combination of complex production processes: admitting a patient, having a clinic visit, going to surgery or a procedure and sending out a bill
- These products involve thousands of processes—many of them very complex
- All of these products involve the concepts of quality, safety, customer satisfaction, staff satisfaction and cost effectiveness
- These products, if they fail, can cause fatality

The Virginia Mason Production System

We adopted the Toyota Production System key philosophies and applied them to healthcare



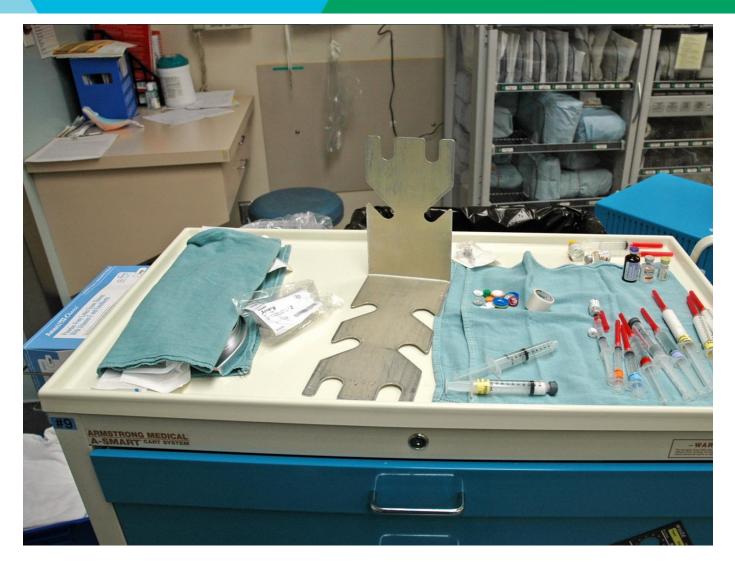
- 1. The patient is **always** first
- Focus on the highest quality and safety
- 3. Engage all employees
- 4. Strive for the highest satisfaction
- 5. Maintain a successful economic enterprise

The Patient is **Always** First



- The patient is at the top of our strategic plan
- Value is defined by the patient
- Patient's voice is embedded in our improvement activities

Visual Control for Safety



5S Anesthesia Shadow Board - Before

Visual Control for Safety



5S Anesthesia Shadow Board - After

Stopping the Line ™ Virginia Mason's Patient Safety Alert System ™

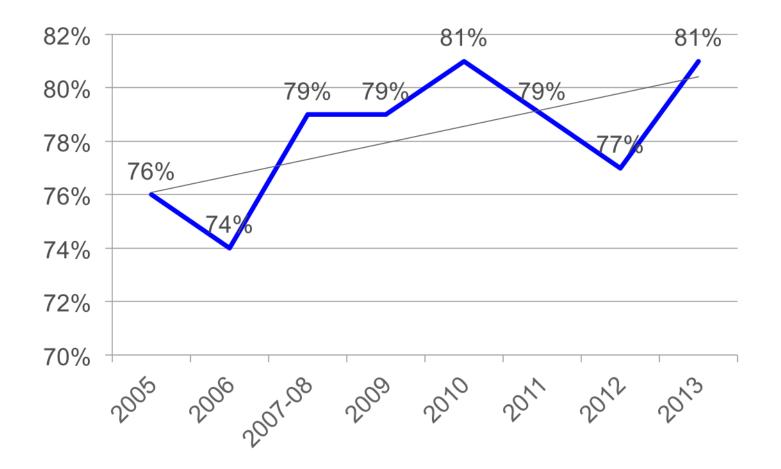
Patient Safety Alert Process ™

Created August 2002

- Leadership from the top
- "Drop and run" commitment
- 24/7 policy, procedure, staffing
- Legal and reporting safeguards



Safety Culture Question – Staff Speak Up Freely*



*Question: Staff will speak up freely if they see something that may negatively affect patient safety

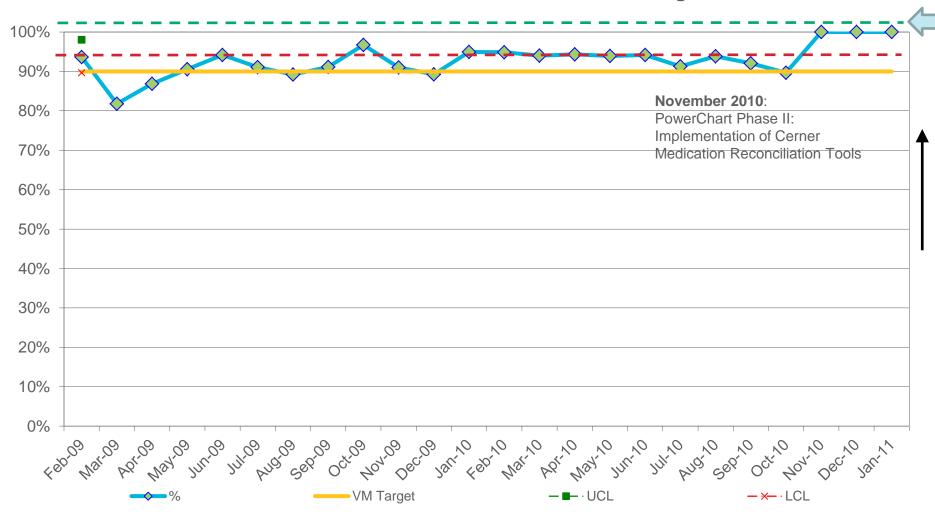
A Turning Point for Virginia Mason

- In 2004, a medical error caused the tragic death of Mary L. McClinton, a VM patient.
- This event and the decision for full public transparency was a defining moment for the organization.



2011 Mary McClinton Safety Award Medication Reconciliation

Percent of Reconciled Medications on Discharge



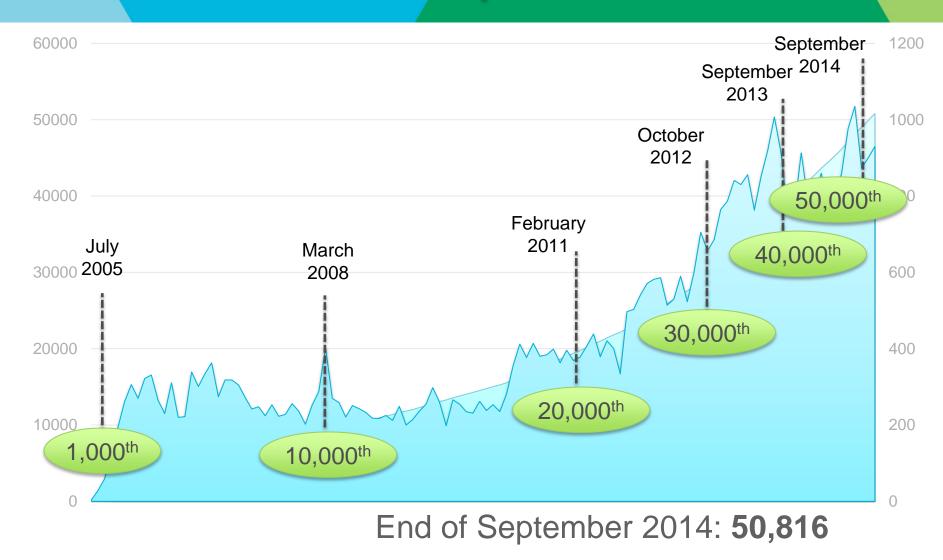
"Good Catch!" Safety Award



Safety Innovation



50,000th PSA Reported

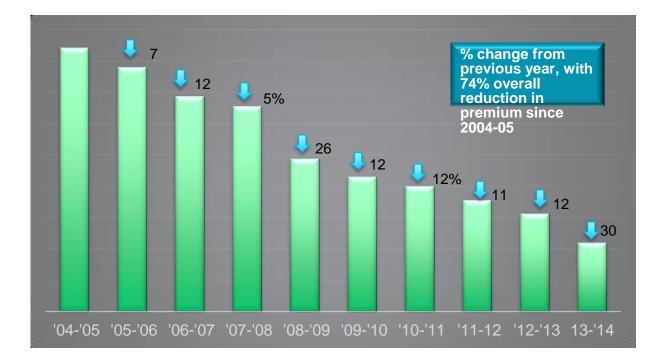


Effectiveness of Patient Safety Program



Excludes claims without payment

VMHS Hospital Professional/General Liability Insurance Premiums



"Nursing Cells" – Results > 90 days

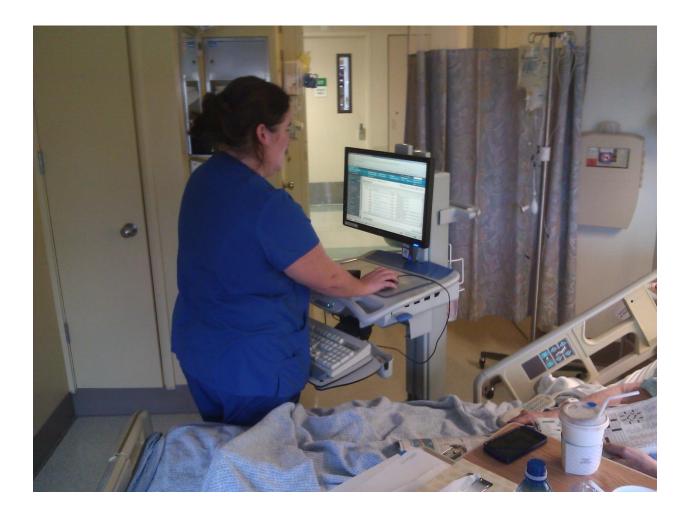
RN time available for patient care = 90%!

Before

- RN # of steps = 5,818
- PCT # of steps = 2,664
- Time to the complete am cycle of work = 240'
- Patients dissatisfaction = 21%
- RN time spent in indirect care = 68%
- PCT time spent in indirect care = 30%
- Call light on from 7a-11a = 5.5%
- Time spent gathering supplies = 20'



One Piece Flow: Documentation in Room or Close to Patients



Standard Work: Bedside Report

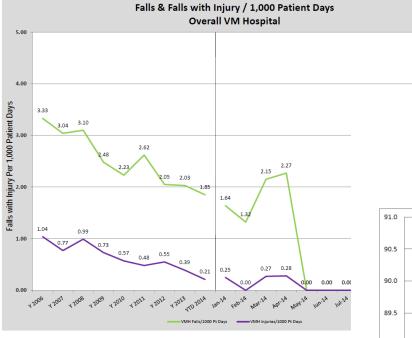
WHY:

Introduction of oncoming caregivers Involves the patient in discussion Builds in safety Adds time with patient

<image>

Bedside Handoff Checklist								
1 Introduction								
	\blacktriangleright	Name of oncoming RN and assistant						
	 Explains handoff process 							
	\succ	Inquires how patient is feeling						
2	ckground (Basics)							
	\blacktriangleright	Age, MD, reason for admission						
	\triangleright	Isolation						
3								
	\succ	Brief history						
	\succ	Functioning prior to admission						
	\succ	Key medications						
	\succ	Tests for the day						
4	Assessment							
	\succ	Patient identification						
	\succ	High risk meds						
	\succ	IV						
	\succ	Physical assessment						
	\succ	Precautions/Skin/Wound						
	\succ	Patient input						
5								
	\triangleright	Plan of the Day						
	\succ	Safety concerns						
	\triangleright	Patient issues						
6	Clo	sing						
	\triangleright	"Is there anything you need at this time?"						
	\triangleright	Determine when will return						

Surrogate Markers: Kaizen

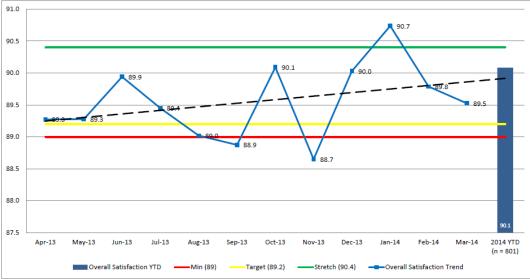


Created by: Analytics x36061 Project Manager: Christina Long x10009

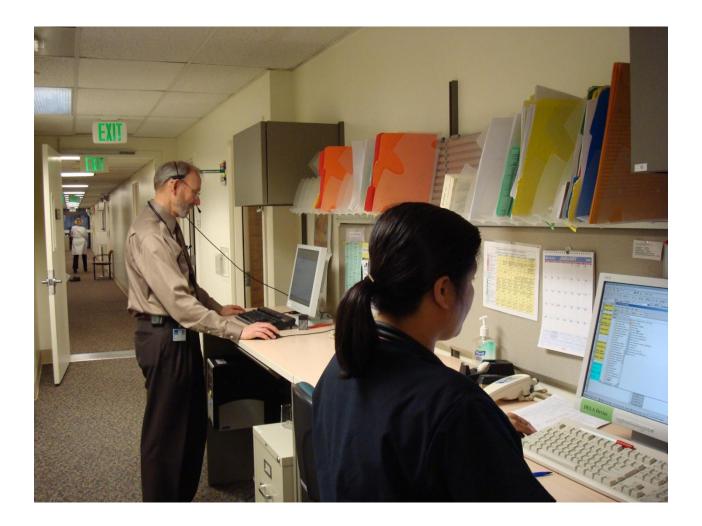
"Confidential Quality Assurance 8



Virginia Masor



VMPS Method: One Piece Flow Flow Stations



Team Based Care: Skill /Task Alignment

Medical Assistant:



Standard rooming sequences

Review Health Maintenance Module

Shared documentation

Coordinating provider "flow" through the day

RN:



Patient assessment

Empowerment of patient for self care

Protocol driven-teaching and coaching for chronic conditions Nursing procedures

Pharmacist:

Medication management for chronic conditions Advanced protocols for disease state management



Provider:

Diagnosis and treatment of new problems Oversight of complicated problems Minor surgical and diagnostic procedures

Mentor and coach for team based care



VMPS Method: Mistake Proofing The Health Maintenance Module

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Results: Quality and Net Savings

 13.3% cost savings achieved for patients enrolled > six months, when compared to case-matched control population

	Medium	Max.	VM IPC	Quality Goal
Quality Measure	Target	Target	Performance	Exceeded
% of patients with poorly				
controlled diabetes				
(Lower=Better)	24.91%	20.19%	9.8%	Yes
% of patients with				
cardiovascular condition who				
have well controlled LDL				
(Higher=Better)	64.74%	69.59%	70.59%	Yes
% of patients with				
hypertension who have well				
controlled blood pressure				
(Higher=Better)	64.97%	72.26%	71.58%	Yes

Build to Order Vision

700 tons of instruments = nine 737's



Our Vision: Build-To-Order Instrument Sets

Did you know that the Sterile Processing team processes **52,271 surgical instruments per day?** Many of these instruments are not even used during an operation. The rule is, if it travels into the OR, it must be sterilized. Once processed the instrument set returns to a shelf in what looks like a huge warehouse, to sit for days, weeks, or months.

It is the future vision of "Build-to-Order" that instrument sets will be customized for the surgeon and procedure to ensure that the OR team receives only what they want for each case. In February a 3P event was held to begin designing this future state. Build-to-Order is a multi-year goal, and ultimately it will reduce our instrument pan inventory by 70% - or 700 tons – the equivalent of 100 elephants! Next steps for this major project include data collection on surgeon preference for each case with a pilot phase planned in Neurosurgery.



Our current state: Instrument sets stored on rows of shelving

BTO in Sterile Processing and Operating Room (3 KEs)

Focus	Results
Decrease assembly time of surgical instruments along with surgical instrument set-up time in the OR	Decrease instrument assembly time by up to 42%
Decrease inventory of instruments for Laminectomy cases	Inventory of the Laminectomy case reduced by 26% (\$16k to \$11.8k)
 Specific focus of events: BTO information flow for Laminectomy cases KE External set-up for Craniotomy KE External set-up of the Minor Set KE 	 Instrument set-up time reduced significantly: Minor set (19 mins to 20 secs) Craniotomy (24:09 to 2:34) Laminectomy case (24:09 to 2:29)





Build To Order Results

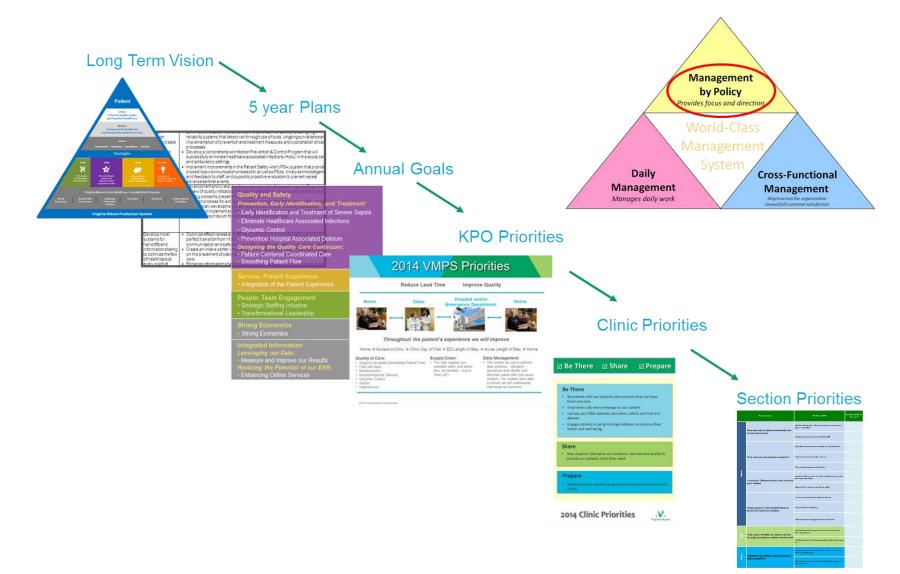
EVENT	OLD	NEW
Croniotomy	SPD Set Up = 34:00 min	SPD Set Up = 18:27 min
Craniotomy	OR Set Up = 24:09 min	OR Set Up = 2:34 min
	SPD Set Up = 34:00 min	SPD Set Up = 20:15 min
Laminectomy	OR Set Up = 24:09 min	OR Set Up = 2:29 min
Minor Set	OR Set Up = 19:21 min	OR Set Up = 0:20 sec

Leadership Requirements: Sustaining the Transformation

- 1. Set priorities that align with the vision
- 2. Use VMPS tools & methods
- 3. Lead change
- 4. Allocate resources to VMPS
- 5. Require accountability
- 6. Implement standard work for leaders



Set Priorities that Align with the Vision



World-Class Management

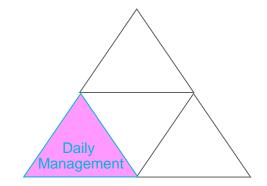
The World-Class Management System is a leadership system that provides focus, direction, alignment, and a method of management for daily work





World-Class Management

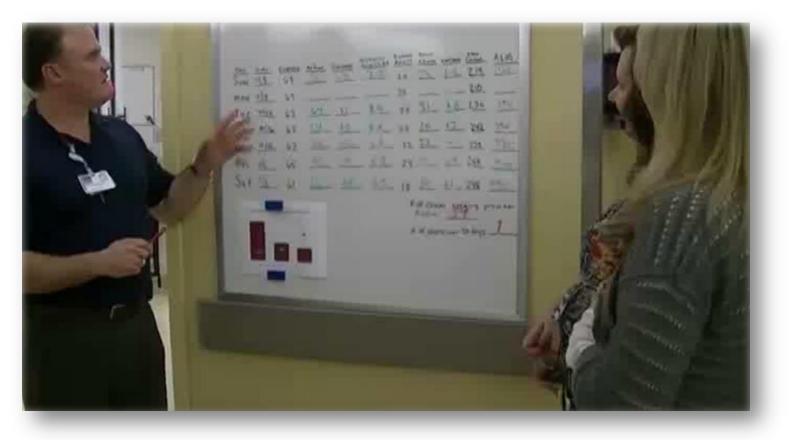
Daily Management: Leaders Have Two Jobs



Run your business
 Improve your business

Visual Controls

ED production board



Daily Accountability

Have daily huddles with your team



Standard Work for Leaders

Specifies the <u>actions</u> to be taken each day to focus on the processes in each leader's area of responsibility.

Clinic Supervisor Daily List

Director Daily List

VM LYNNWOOD DAILY CHECKLIST-SUPERVISOR -NAME: DATE: TASK INSTRUCTIONS GENBA Follow-Up AM Round to direct reporting areas Mid-Day Ensure that needs are being met. Review: PM · Review yesterday's work - note issues Complete Rounding Form Yesterday complete? If not, why? Quality Check New Issues throughout the day Applause Solutions/action items - note below NOTES: Resources needed - note below Ideas for Improvements Transparent Management Questions What is working well for you? Are there any barriers I can remove? · What is not working well for you? Is there anyone I should recognize for good work? · How are your ELI's coming? · May I help you with your ELI's? Return this completed form at the end of the day to the Director

					Director/	VSM Ma	anager
NAME:						Week:	
					TASK		INSTRUCTIONS
N	Tu W Th F HUDDLE		Follow-Up				
					8AM Huddle w/ AdminAsst		Round to direct reporting areas
					8:55AM Huddle w/EyeClinic		Ensure that needs are being met. Review:
					9:30AM Huddle w/ Sup	er Prod Brds	s • Review yesterday's work - note issues
					Check Cerner for messa	ges	Yesterday complete? If not, why?
					1PM Huddle w/ Super F	rod Brds	New Issues throughout the day
					Initial and note time or	all brds	Solutions/action items - note
NOTES:						Resources needed - note	
							Ideas for Improvements
							Transparent Management Questions
							What is working well for you?
							Are there any barriers I can remove?
							What is not working well for you?
							Is there anyone I should recognize for
							good work?
							How are your ELI's coming?
							 May I help you with your ELI's?

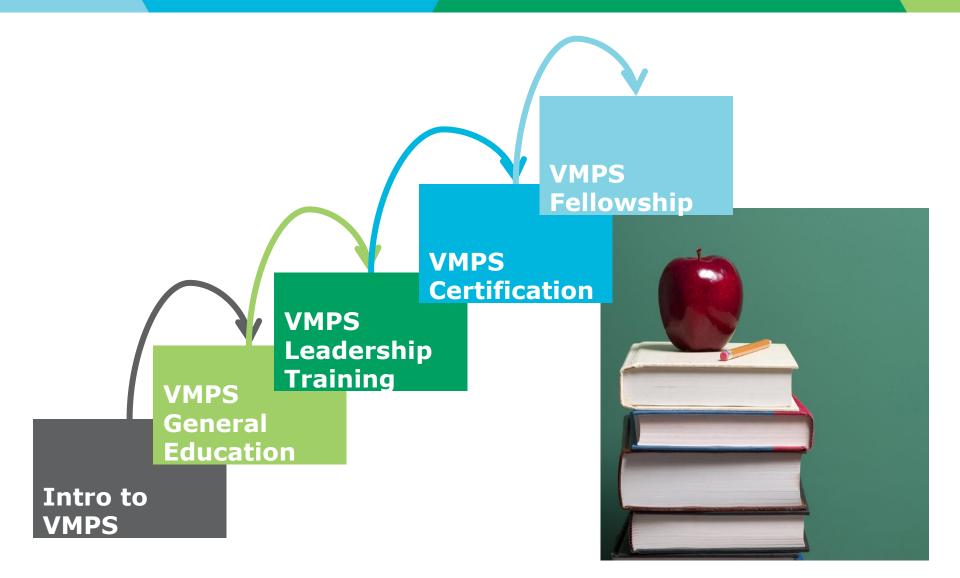
Leaders Need to Be Idea Coaches

- Support staff in working on their ideas, but don't do it for them
- Encourage root cause thinking
- Be straightforward with feedback
- Ask lots of questions to draw out creativity and critical thinking

This will be a big shift for some managers (i.e. being a coach and not the key problem-solver and rescuer!)



VMPS Education



Respect for People refers to how we treat each other as we work together to create the perfect patient experience.

Respect for People

FOUNDATIONAL BEHAVIORS OF RESPECT

Top 10 Ways to Show Respect to People

- Listen to understand. Good listening means giving the speaker your full attention. Non-verbal cues like eye contact and nodding let others know you are paying attention and are fully present for the conversation. Avoid interrupting or cutting others off when they are speaking.
- Keep your promises. When you keep your word you show you are honest and you let others know you value them. Follow through on commitments and if you run into problems, let others know. Be reliable and expect reliability from others.
- Be encouraging. Giving encouragement shows you care about others and their success. It is essential that everyone at VM understand their contributions have value. Encourage your co-workers to share their ideas, opinions and perspectives.
- 4. Connect with others. Notice those around you and smile. This acknowledgement, combined with a few sincere words of greeting, creates a powerful connection. Practice courtesy and kindness in all interactions.
- 5. Express gratitude. A heartfelt "thank you" can often make a person's day and show them you notice and appreciate their work. Use the VM Applause system, a handwritten note, verbal praise, or share a story of "going above and beyond" at your next team meeting.
- 6. Share information. When people know what is going on, they feel valued and included. Be sure everyone has the information they need to do their work and know about things that affect their work environment. Sharing information and communicating openly signals you trust and respect others.

- 7. Speak up. It is our responsibility to ensure a safe environment for everyone at VM; not just physical safety but also mental and emotional safety. Create an environment where we all feel comfortable to speak up if we see something unsafe or feel unsafe.
- Walk in their shoes. Empathize with others; understand their point of view, and their contributions. Be considerate of their time, job responsibilities and workload. Ask before you assume your priorities are their priorities.
- 9. Grow and develop. Value your own potential by committing to continuous learning. Take advantage of opportunities to gain knowledge and learn new skills. Share your knowledge and expertise with others. Ask for and be open to feedback to grow both personally and professionally.
- 10. Be a team player. Great teams are great because team members support each other. Create a work environment where help is happily offered, asked for and received. Trust that teammates have good intentions. Anticipate other team members' needs and clearly communicate priorities and expectations to be sure the work load is level loaded.



VIRGINIA MASON NAMED AMERICA'S OP HOSPITA OF THE DECADE.

National rating based on patient safety, high quality. mitments and major achievements in reducing medical errors and for innova-

Virginia Mason Medical Center is one of only two hospitals in the United States - the other is the University of Maryland Medical Center in Baltimore – to earn the title of Top Hospital of the Decade by tille of Top Hospital of the Decade by The Leapfrog Group rating organization. The Leapfrog Group is a coalition of public and private purchasers of employee health benefits founded a decade ago to work for improvements in health care safety, quality and affordability. Both Virginia Mason and UMMC were cited for their strong public com-

tions in patient safety and quality. In announcing the honor, The Leap-frog Group Board Chair David Knowlton described the efforts of the two hospitals as "extraordinary in every sense of the word." He said they chose to commit themselves to change, accountability and transparency. Virginia Mason has proved that providing high quality health care at a lower cost is not only achievable, but should be an expectation. "They've done the work that others must now undertake."

> processes at automobile plants. Medicine and health care are obviously quite different than manufacturing cars (or

anything else), but management concepts such as continuous improvement and zero-defect processes can be applied to a

wide range of human activities. Virginia Mason began to apply some of those principles to health care manage-

ment and organizational structure. Over the years, Virginia Mason leaders crafted

what now is known as the Virginia Mason

TEAM YRRSNA

MEDICINE

© 2010 Virginia Mason Health System

Production System - VMPS

A commitment to continuous improvement. Their search took them across the world, to Japan, and across industries, to Toyota, where they studied concepts and

Virginia Mason's climb to the top began about ten years ago and has been a steady, deliberate effort.

At the turn of this young century, leadership at Virginia Mason became convinced the future depended not only on national policy changes and sweeping reforms, but also on factors closer to home – such as eliminating waste, cutting costs, and improving the quality of services. And, most important, always put-ting the patient first, above all.

After looking in vain for outstanding examples of progress to learn from within the U.S. health care industry, Virginia Mason leadership ventured very far outside the box.

Real changes. Real results.

Results of VMPS over the last decade tend to startle many health care professionals: nurses at Virginia Mason Medical Center now can spend on average 90% of their time with patients, compared with an average of 35% elsewhere; physicians see *more patients* during the day, with *more time* to focus on the patient during the visit; the time to report lab test results to the patient has been reduced by 85%; the hospital has saved \$1 million in supply expense in a single year; with increased patient safety and quality professiona liability insurance cost decreased 48.0% from 2004 to 2009; the pharmacy has improved medication distribution from the moment of physician-order to availability for administration from 2.5 hours to ten minutes.

Success at Virginia Mason has attracted national attention. For each of the last five years, it has been ranked high among Leapfrog's Top Hospitals. Hospital administrators from around the world have expressed interest in VMPS, and hundreds have traveled to Seattle to learn more. To accommodate them, Virginia Mason established an Institute with a mission to help other health care professionals understand and apply the same or similar principles in their own rganizations. The idea is better health care for more patients at a lower cost. Now,



Gary S. Kaplan, MD, FACP, FACMPE, FACPE

QUALITY AND RESOURCE USE COMPARISON + U.S. Hospitals Washington Hospitals O Virginia Mason Medical Cente 100 90 0 --80 70 Score 60 Use S 50 40 lesoi 30 20 10 10 20 30 40 60 80 90 100 70 Quality Score @ 2010 The Leapfrog Group

The Leaptrog Group measures and compares American hospitals on their level of efficiency, defined as intersection of quality and occi." This metric goes to the heart of the U.S. health care chelling to pr high-quality care while controlling costs. When compared with 1,1GS hospitals in 41 states, Virginia M finished in the top 1 percent on the combination of quality and cost.

Learn more.

You are invited to find out more about Virginia Mason Medical Center's continuing efforts to improve health care for all at VirginiaMasonInstitute.org or VirginiaMason.org. To find more information about The

Leapfrog Group, visit leapfroggroup.org.



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Chosen By Businesses:





Let's Build Something Together"



Surgical Warranty

Hip and Knee Replacement Surgery

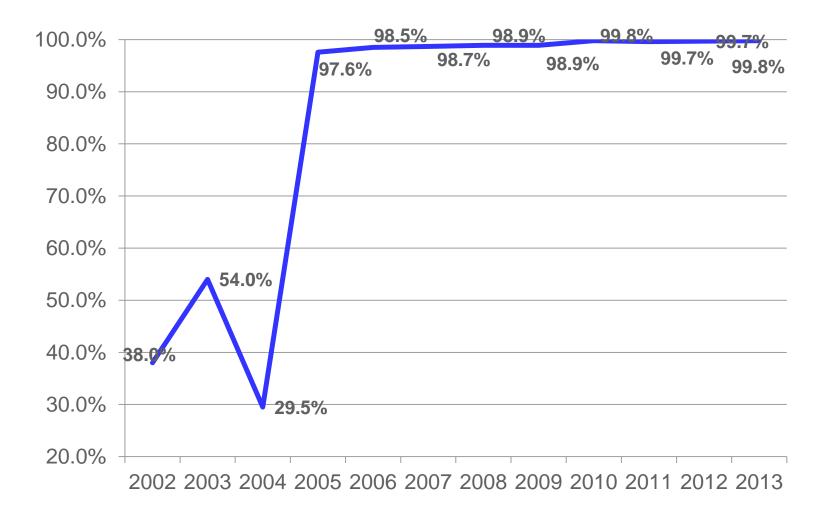
- Virginia Mason first in region to offer this protection
- Kicked off with business leaders, media at Seahawks game
- Expands opportunity for more businesses to access our high-quality, bundled care

Flu Vaccination "Fitness for Duty"

Do we put patient first? Compelling science Staff resistance Staying the course Organizational Pride



VMMC Influenza Vaccination Rates



Transforming Healthcare

From

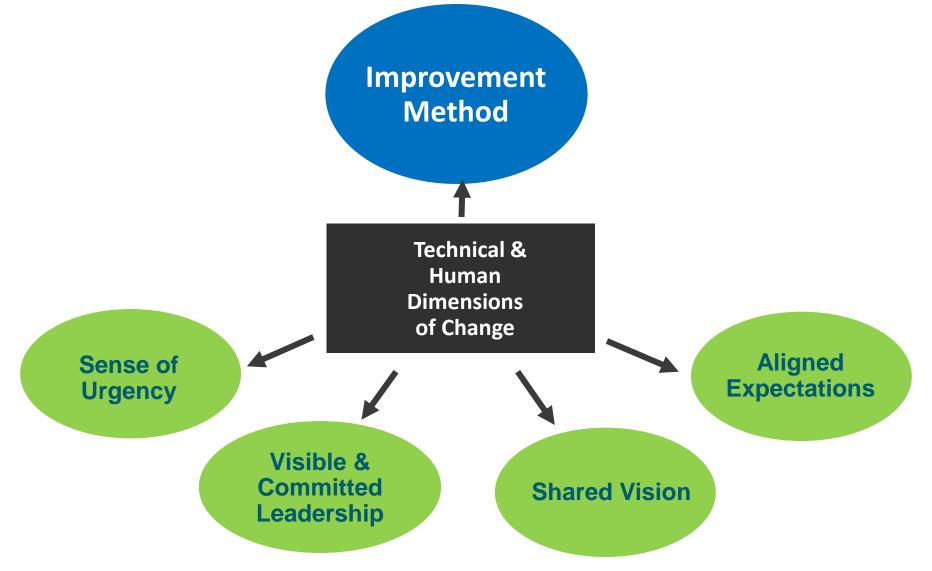
- Provider First
- Waiting is Good
- Errors are to be Expected
- Diffuse Accountability
- Add Resources
- Reduce Cost
- Retrospective Quality
 Assurance
- Management Oversight
- We Have Time

- Patient First
- Waiting is Bad
- Defect-free Medicine
- Rigorous Accountability

Το

- No New Resources
- Reduce Waste
- Real-time Quality Assurance
- Management On Site
- We Have No Time

Requirements for Transformation







"In times of change, learners inherit the earth, while the learned find themselves beautifully equipped to deal with a world that no longer exists."

- Eric Hoffer



Virginia Mason

Each Person. Every Moment. Better Never Stops.