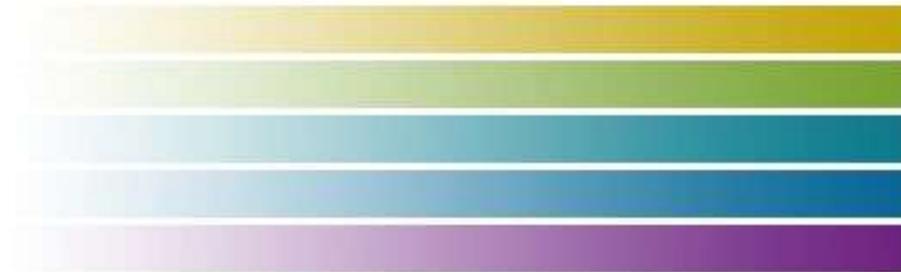




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Vanderbilt's Choosing Wisely Experience: Guided Trainee Leadership to Reduce Unnecessary Labs, Telemetry, and Chest Radiographs

Wade Iams, MD, John McPherson, MD
Alliance for Academic Internal Medicine
Skills Development Conference
National Harbor, MD
October 22, 2016



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Audience Introduction



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Overview



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-
- Background
 - Kotter's Eight Steps of Change
 - Vanderbilt Choosing Wisely Experience
 - Takeaways



Burning Platform



- Evolve to Excel (E2E)
 - Expense reductions
 - Staff reductions
 - Reengineer workplace – “workflow redesign”
- “The most effective spokespersons for our medical center have, and will always be, our own people.”

Vice Chancellor/Dean Jeff Balsler



Choosing Wisely



- ABIM 2012
- Aims of advancing a national dialogue on avoiding wasteful or unnecessary medical tests, treatments, and procedures
 - Supported by evidence
 - Not duplicative of other tests and procedures already received
 - Free from harm
 - Truly necessary



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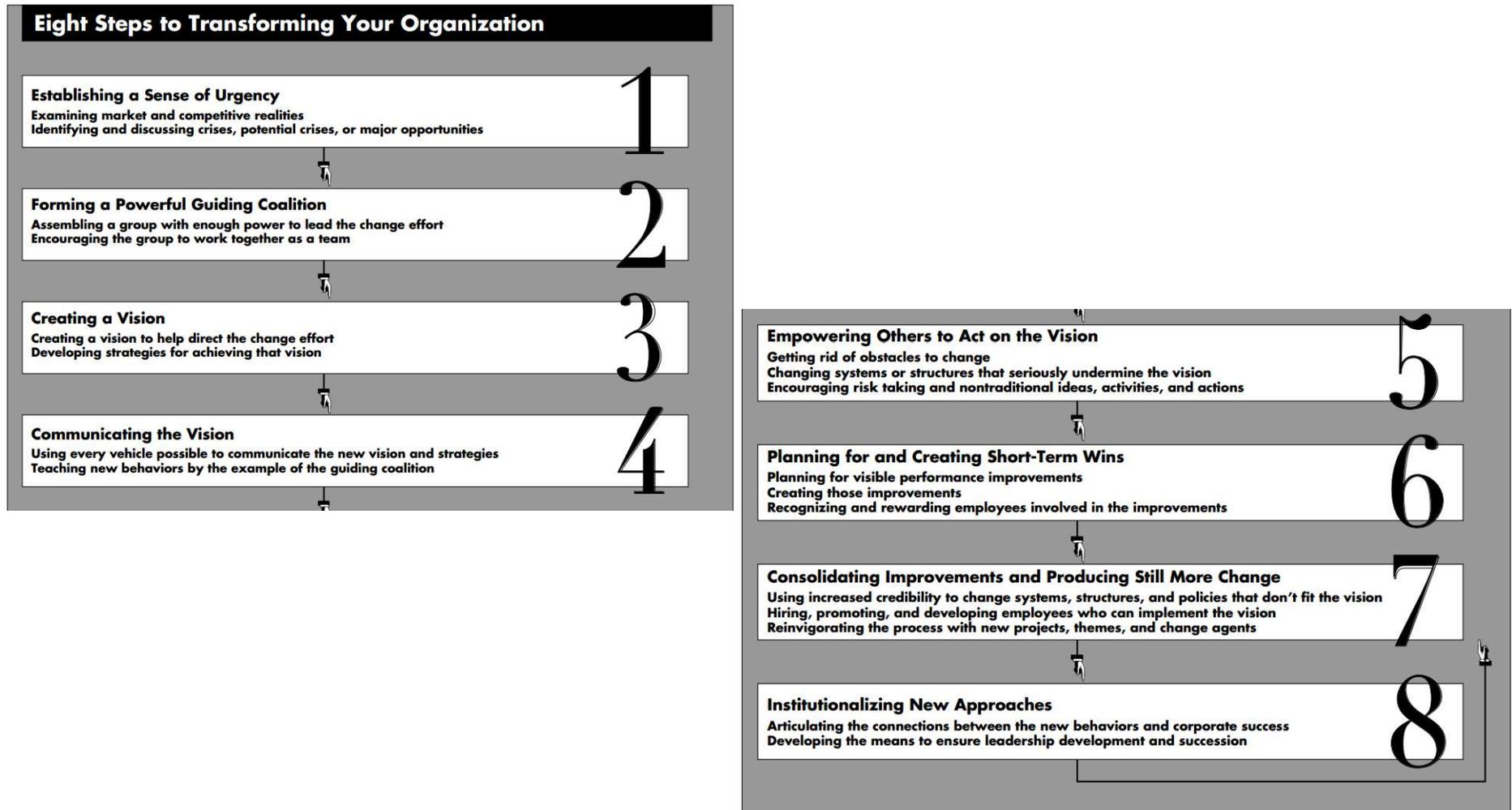


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Kotter's Eight Steps of Change



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* John P. Kotter. Leading change: why transformation efforts fail. 1995. Harvard Business Review; OnPoint.



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Small Group Cases



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-
- Does your hospital overutilize daily labs, CXRs, CTs, or antibiotics?

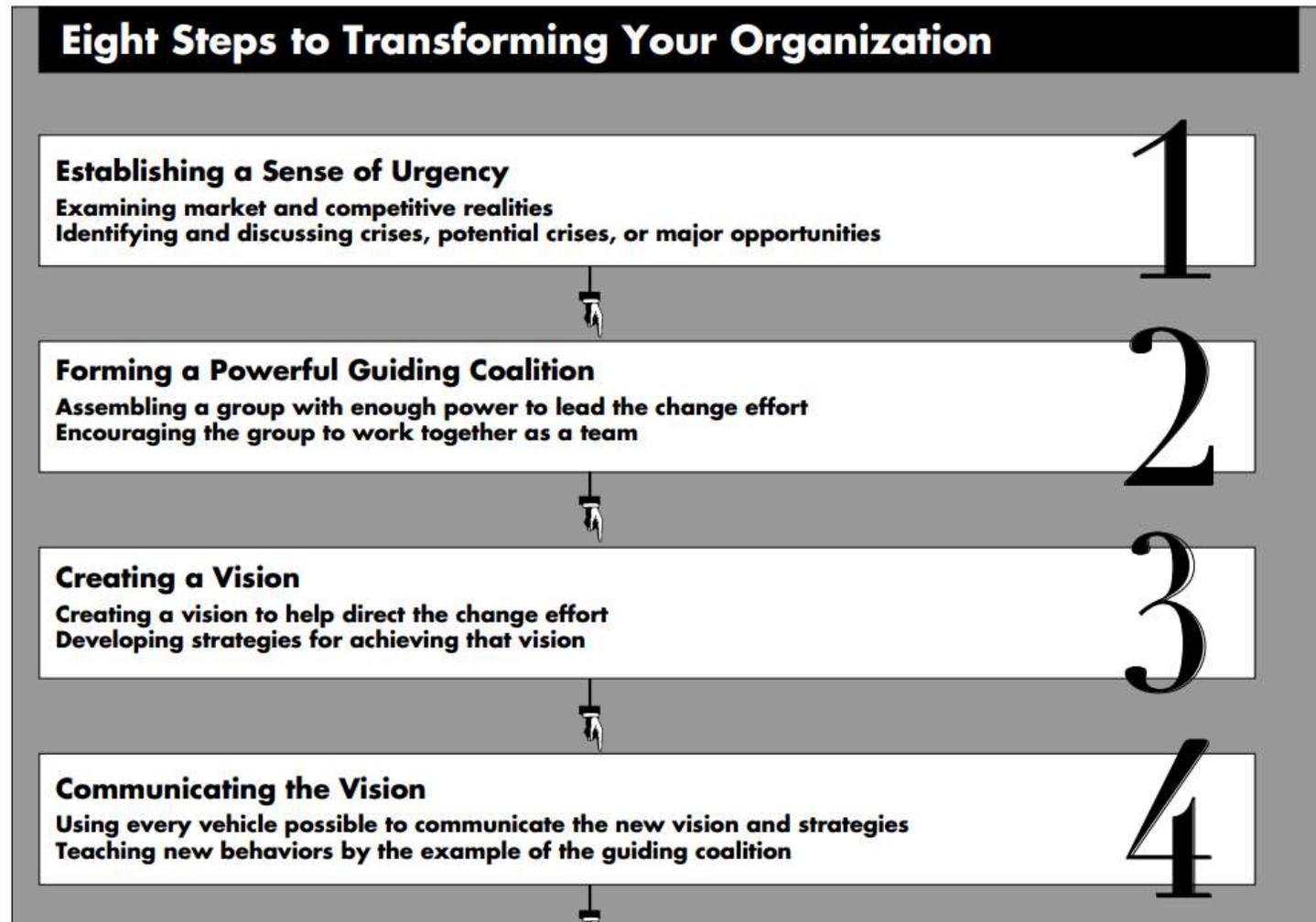


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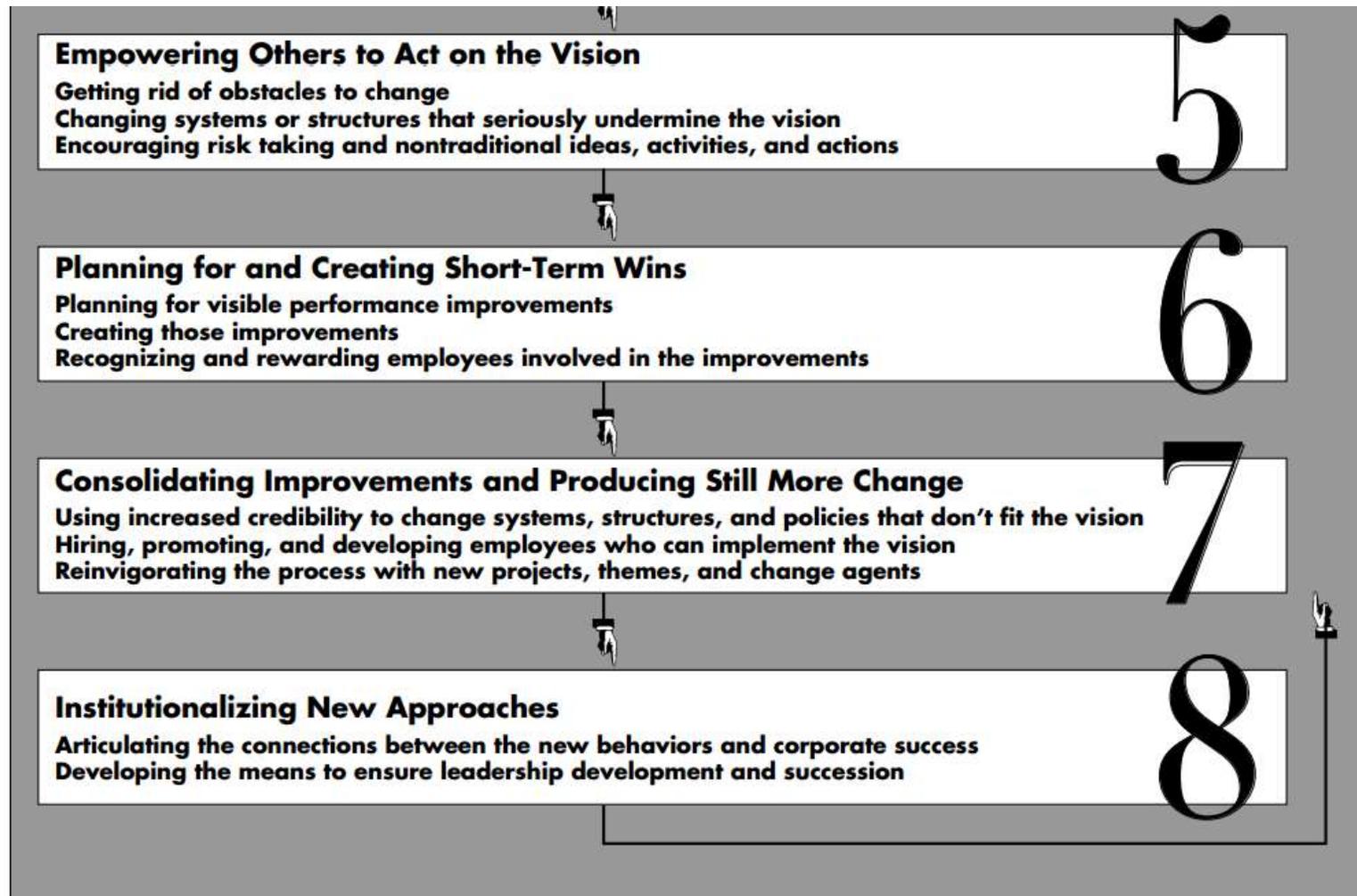


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Choosing Wisely Vanderbilt



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Dec. 2013

• Inception at GMEC meeting

- Prompted by Designated Institutional Official
- Program Director support
- Resident and APRN volunteers

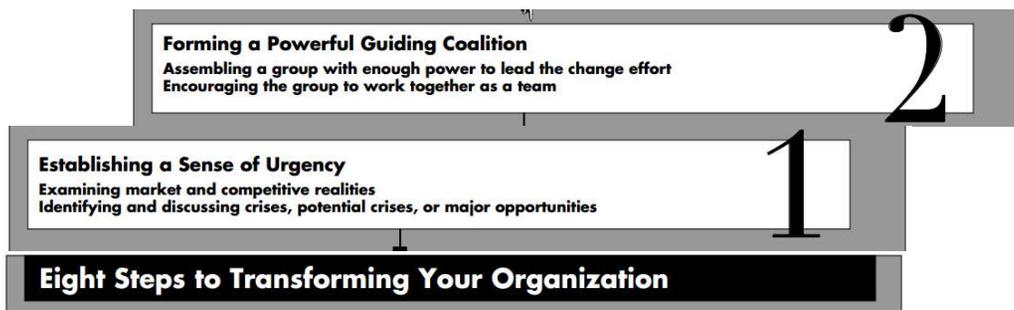


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Establishing a Sense of Urgency
Examining market and competitive realities
Identifying and discussing crises, potential crises, or major opportunities

1

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Society of Hospital Medicine – **Adult Hospital Medicine**



Five Things Physicians and Patients Should Question

Choosing Wisely

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Critical Care Societies Collaborative - **Critical Care**



We help the world breathe
PULMONARY • CRITICAL CARE • SLEEP



Five Things Physicians and Patients Should Question

Don't order diagnostic tests at regular intervals (such as every day), but rather in response to specific clinical questions.

Many diagnostic studies (including chest radiographs, arterial blood gases, blood chemistries and counts and electrocardiograms) are ordered at regular intervals (e.g., daily). Compared with a practice of ordering tests only to help answer clinical questions, or when doing so will affect management, the routine ordering of tests increases health care costs, does not benefit patients and may in fact harm them. Potential harms include anemia due to unnecessary phlebotomy, which may necessitate risky and costly transfusion, and the aggressive work-up of incidental and non-pathological results found on routine studies.

5

Don't perform repetitive CBC and chemistry testing in the face of clinical and lab stability.

Hospitalized patients frequently have considerable volumes of blood drawn (phlebotomy) for diagnostic testing during short periods of time. Phlebotomy is highly associated with changes in hemoglobin and hematocrit levels for patients and can contribute to anemia. This anemia, in turn, may have significant consequences, especially for patients with cardiorespiratory diseases. Additionally, reducing the frequency of daily unnecessary phlebotomy can result in significant cost savings for hospitals.

4

Don't order continuous telemetry monitoring outside of the ICU without using a protocol that governs continuation.

Telemetric monitoring is of limited utility or measurable benefit in low risk cardiac chest pain patients with normal electrocardiogram. Published



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Establishing a Sense of Urgency
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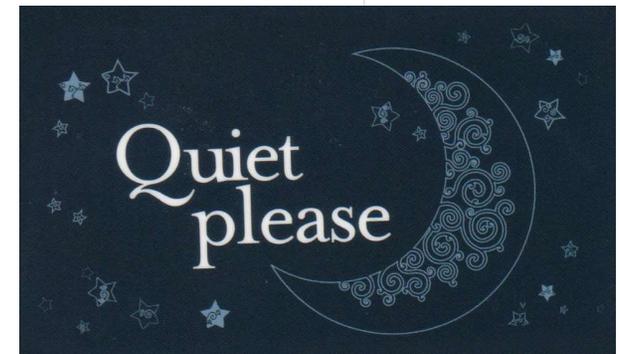
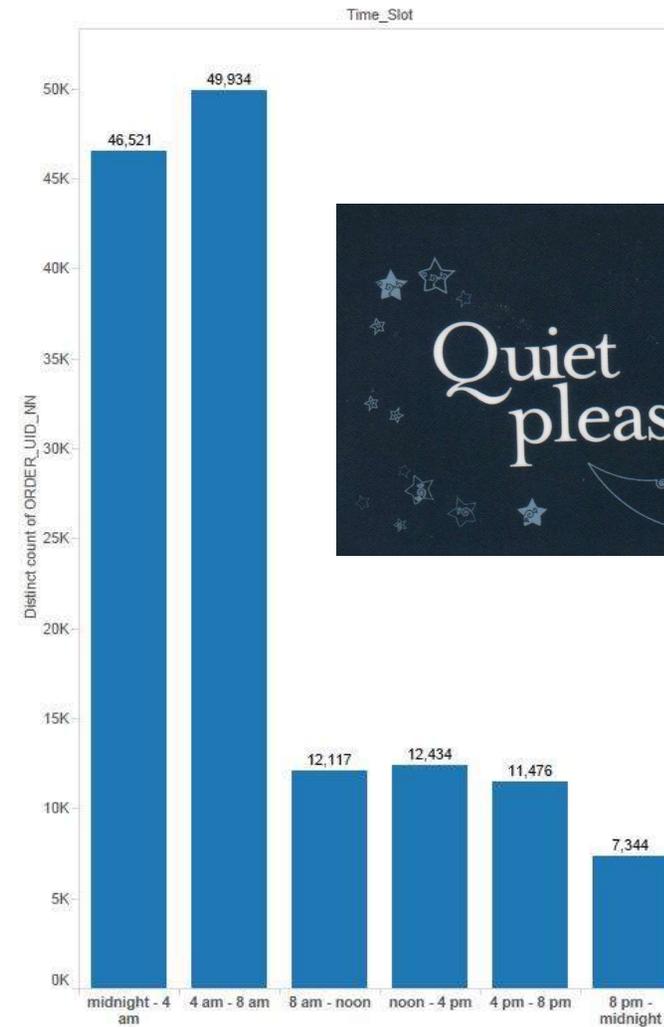
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Cnt Orders by time





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Forming a Powerful Guiding Coalition

Assembling a group with enough power to lead the change effort
Encouraging the group to work together as a team

2



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Challenges



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Creating a Vision

Creating a vision to help direct the change effort
Developing strategies for achieving that vision

3

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Creating a Vision

Creating a vision to help direct the change effort
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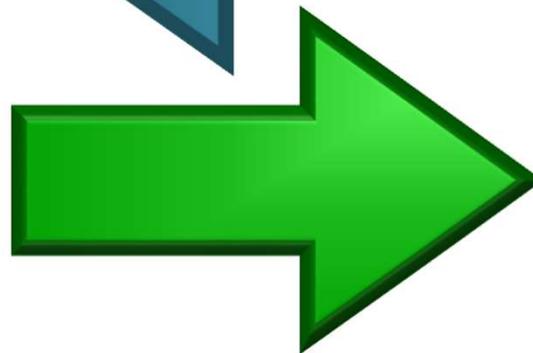
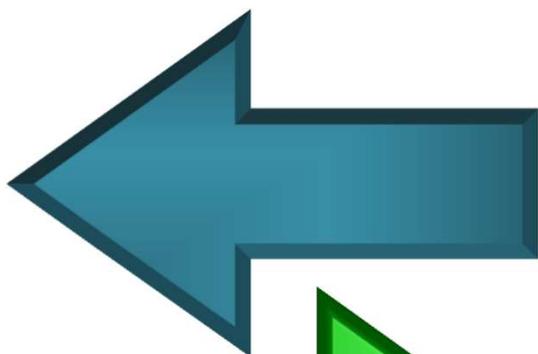


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WHAT'S YOUR DEFAULT?

DAILY LABS



**NECESSARY
LABS**

CHOOSE WISELY.



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Communicating the Vision

Using every vehicle possible to communicate the new vision and strategies
Teaching new behaviors by the example of the guiding coalition



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“It’s not your fault.”



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<http://www.choosingwisely.org>

REDUCE UNNECESSARY LABS IMPROVE PATIENT CARE

GET TO KNOW THESE NUMBERS:

250	Estimated charge for "routine" daily labs (per patient, per day) at VUMC
100	Volume (mL) of phlebotomized blood leading to a 2 point drop in a patient's hematocrit ²
50	The average volume (mL) of blood removed by phlebotomy per day in an ICU patient ³
	The volume (mL) of phlebotomized blood required to increase a patient's risk for moderate to severe hospital acquired anemia by 20% ⁴
5	The five most common "routine" labs ordered on a recurring basis are: CBC, BMP, calcium, magnesium, phosphorous ⁵
	An intervention aimed at reducing unnecessary ordering of these labs achieved the following results: ⁵ <ul style="list-style-type: none"> • 12% fewer inpatient tests • 21% fewer inpatient phlebotomies • A decrease in the average number of patients requiring blood draws during morning phlebotomy rounds from 127 to 84 • An estimated yearly savings of \$73,000 just by reducing the amount of chemical reagents needed to perform these five tests
2	Estimated number of weeks it takes for high-risk ICU patients receiving frequent lab draws to require a blood transfusion due to phlebotomy ³
1	The number of people it takes to make a difference by ordering fewer unnecessary labs

WHAT'S YOUR DEFAULT?



Brought to you by the Vanderbilt Choosing Wisely House Staff Steering Committee*

Josh M. Heck, MD - (Co-Chair) Radiology Resident | Wade Iams, MD - (Co-Chair) Internal Medicine Resident
Meghan Kapp, MD - Pathology Resident | David Leverenz, MD - Internal Medicine Resident | Cody Penrod, MD - Pediatric Resident
Jenna Walters, MD - Anesthesiology Resident | Michael Vella, MD - General Surgery Resident

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Donald Brady, MD - Associate Dean for Graduate Medical Education | Jeff Crasay, MD - Neuroradiology Attending
Bonnie Miller, MD - Sr. Associate Dean for Health Sciences Education | Jack Stamer, MD - Chief of Quality Informatics

1. Staabing DA, Miner TJ. Surgical vampire and rising health care expenditure: reducing the cost of daily phlebotomy. *Arch Surg*. 2011 May;146(5):524-7. [PMID: 2175805] | 2. Haverstickman P, Bagal A, Elish A, Deshpande AS, Choudhry M. Do blood tests cause anemia in hospitalized patients? *Gen Intern Med*. 2009 Jun;24(6):520-524. [PMID: 20070727] | 3. Luo KC, et al. Simulation of repetitive diagnostic blood tests and onset of iron-deficient anemia in critical care patients with a mathematical model. *Consensus in Biology and Medicine*. 2013;8:84-90. [PMID: 23233483] | 4. Salisbury AC, et al. Diagnostic blood loss from phlebotomy and hospital-acquired anemia during acute myocardial infarction. *Arch Intern Med*. 2011 Oct 15;171(18):1646-1652. [PMID: 21829463] | 5. New TO, et al. Reducing unnecessary resident laboratory testing in a teaching hospital. *Am J Clin Pathol*. 2006;118(3):220-6. [PMID: 16861894] | 6. [ChoosingWisely.org](http://www.choosingwisely.org), top five lists by the Society of Hospital Medicine and the Critical Care Society Collaborative.

*Choosing Wisely is an initiative of the ABIM Foundation. We are not affiliated, authorized, endorsed by, or in any way officially connected with the ABIM Foundation.



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REPETITIVE LAB TESTING:

FREQUENTLY HELD MISCONCEPTIONS AND ASKED QUESTIONS

- What if I miss something important?**
You won't. Multiple studies looking at both ICU and floor patients have demonstrated significant (up to 42%) reductions in blood tests without any negative impact on mortality, length of stay, transfer to ICU, readmission rates or ventilator days.¹⁻⁵ If their clinical status unexpectedly changes you can always order labs at that time.
- What will my attending think if I don't have labs?**
They will be impressed with your commitment to evidence based, cost-effective care. They may even give you an "Aspirational" ranking on your ACGME Milestone evaluation (MK2 and SBP3 – "recognize and address common barriers to cost-effective care and actively participates in initiatives").
- What's the harm in just ordering the labs?**
Unnecessary testing can result in several types of harm to the patient: technical errors, injuries, pain, hospital acquired anemia, and risks associated with working up incidental or erroneous abnormal results.¹ Hospital acquired anemia due to excessive phlebotomy has been associated with increased morbidity and mortality.⁶
- More labs = better patient care.**
Not necessarily. Sometimes these labs will result in unnecessary harm as discussed in *Misconception 3*. In addition, excessive labs can significantly increase the patient's bill, interrupt sleep, increase suffering due to needle sticks, decrease patient satisfaction and increase the overall cost of healthcare.
- What can I do?**
Discuss lab results on rounds with your team. Mention them explicitly when making a plan for the patient. Ask if they are really needed. If in doubt, try not getting labs. You can always order them later. Do you have to have the labs in the morning for rounds? Or can it wait until you have a specific concern based on clinical findings? It is possible to make a difference. Other institutions have successfully demonstrated 20 – 40% drops in the number of tests ordered.¹⁻⁶

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A New Opportunity to Choose Wisely

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Order Fewer Chest X-rays

Three Ways to Choose Wisely:

- 1 In the ICU:** The Critical Care Societies Collaborative recommends against ordering daily chest x-rays without a clinical indication.
- 2 Pre-op:** The American College of Radiology recommends avoiding pre-operative chest x-rays for ambulatory patients with unremarkable history and physical exams.
- 3 New admissions:** The American College of Radiology recommends obtaining chest x-rays if you suspect acute cardiopulmonary disease or in a patient older than 70 with chronic stable cardiopulmonary disease who does not have a recent x-ray.

Each day more than half of ICU patients at VUMC receive a CXR.



The average daily cost of CXRs in ICUs at VUMC is more than \$1,500.

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1. Choosing Wisely Top Five List of the Critical Care Societies Collaborative <<http://www.choosingwisely.org/wp-content/uploads/2014/01/SCGM-5things-List-012014.pdf>> accessed February 15, 2015
2. Ganapathy A, Adhikari NK, Spiegelman J, Scales DC. Routine chest x-rays in intensive care units: a systematic review and meta-analysis. Crit Care. 2012;16(2):R68.
3. Choosing Wisely Top Five List of the American College of Radiology <http://www.choosingwisely.org/wp-content/uploads/2013/01/5things_12_factsheet_Amer_Coll_Radiology.pdf> accessed February 15, 2015
4. Mohammed TL et al. Expert Panel on Thoracic Imaging. ACR Appropriateness Criteria® routine admission and preoperative chest radiography. [Online publication]. Reston (VA): American College of Radiology (ACR); 2011

Frequently Held Misconceptions

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- 1 My ICU patient needs a chest x-ray (CXR) every morning regardless of clinical status.**
Not necessarily. A meta-analysis of 9 studies showed no difference in mortality, ICU length of stay, or duration of mechanical ventilation in patients who received CXRs only based on clinical changes vs. those receiving routine, daily CXRs.¹ Other studies have shown a 32-45% reduction in CXR orders with no change in patient outcomes.^{2,3}
- 2 In the majority of cases my morning chest x-ray changes management.**
Quite the opposite. A good rule is to always order a CXR to answer a clinical question. One study, conducted in an ICU, found that when performing routine, daily CXRs, only 5.5% of radiographs resulted in changes in management.⁴
- 3 There is no harm in routine, daily CXR's in ICU patients.**
False. The costs to patients include unnecessary work-ups of false positive results, excess radiation exposure, dislodged lines and endotracheal tubes during repositioning, and money (\$24 per CXR). It also takes away resources from support staff needed to evaluate more unstable patients.
- 4 Every patient needs a chest x-ray before surgery.**
Not the case. Patients with history or physical exam findings suggestive of cardiopulmonary disease or patients over age 70 without a CXR in the preceding six months may benefit from a pre-op CXR.⁵
- 5 I will miss something by not ordering a routine, morning chest x-ray on my intubated patient.**
It's unlikely. While most patients have a clinical indication for a CXR in the first 48 hours after intubation, patients ventilated >48 hours are unlikely to benefit from routine imaging. One study found only a 0.7% risk of delayed diagnoses among patients not receiving routine CXRs; most of the delayed diagnoses were mal-positioned NG tubes.⁴

References:

1. Ganapathy A, Adhikari NK, Spiegelman J, Scales DC. Routine chest x-rays in intensive care units: A systematic review and meta-analysis. Crit Care. 2012;16(2):R68.
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Indications for Telemetry Use

1. **ADMISSION FOR ARRHYTHMIA**
 - a. Hemodynamically unstable
 - b. High-grade AV block
 - c. Undergoing cardiac drug titration
 - d. Prolonged QT interval
 - e. ICD firing
2. **MONITORING FOR SERIOUS ARRHYTHMIA**
 - a. Toxic/metabolic disturbances
 - b. ACS
 - c. Chest pain/rule out MI in at-risk patients
 - d. Acute CHF exacerbation
3. **POST PROCEDURES**
 - a. Transvenous pacemaker
 - b. ICD or permanent pacemaker
 - c. Cardiac catheterization
 - d. Cardiac surgery
 - e. Ablation
4. **SYNCOPE**
 - a. Strong suspicion for cardiac involvement (unknown origin, history of heart disease)
5. **ACUTE MYOCARDITIS, PERICARDITIS, ENDOCARDITIS**
6. **CEREBROVASCULAR PROCESSES**
 - a. Acute CVA or TIA
 - b. Acute SAH
7. **OTHER**
 - a. Unstable patient in ICU setting
 - b. Post-cardiac arrest
 - c. Intra-aortic balloon pump

Do not use telemetry for...

- Low risk chest pain/rule out MI
- Low risk neurogenic or orthostatic syncope
- Acute exacerbation of COPD (unless cardiac etiology suspected)
- Stable patients requiring anticoagulation for PE
- Rate controlled, chronic atrial fibrillation
- Stable asymptomatic patients with chronic PVCs, NSVT who are hospitalized for non-cardiac reasons
- Hemodialysis patients (unless acute indication for tele present)
- Minor blood transfusions
- Young patients without cardiac disease
- Undergoing uncomplicated surgical procedures
- Obstetric patients (unless heart disease present)
- Code status such that an arrhythmia would not be treated

*Concern for hypoxia is not an indication for telemetry.

Please consider instead use of continuous pulse oximetry.



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Challenges

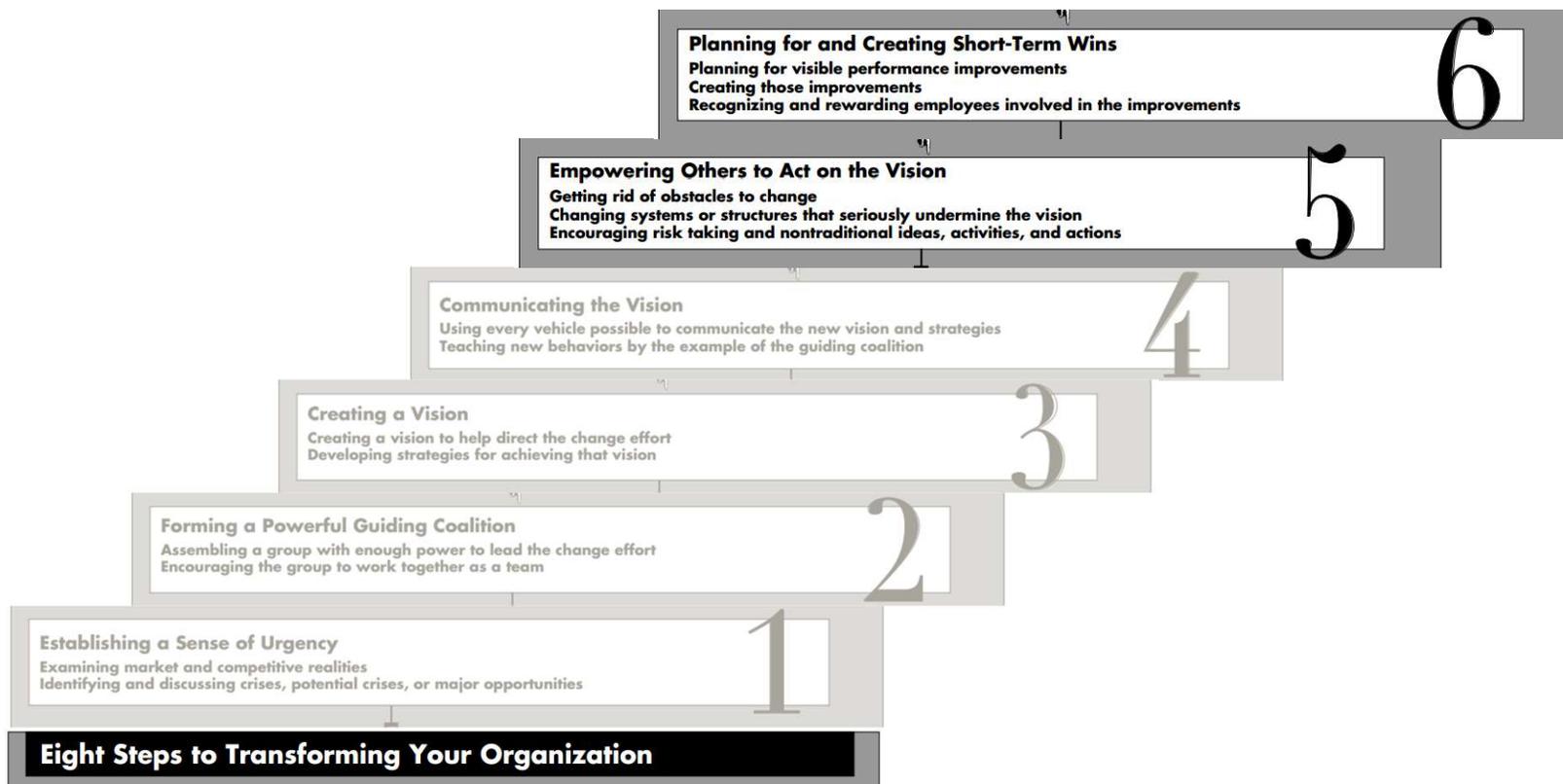


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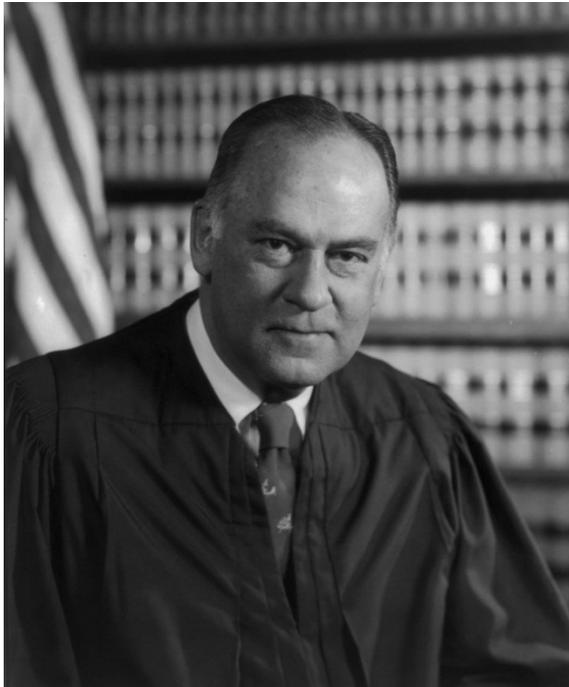


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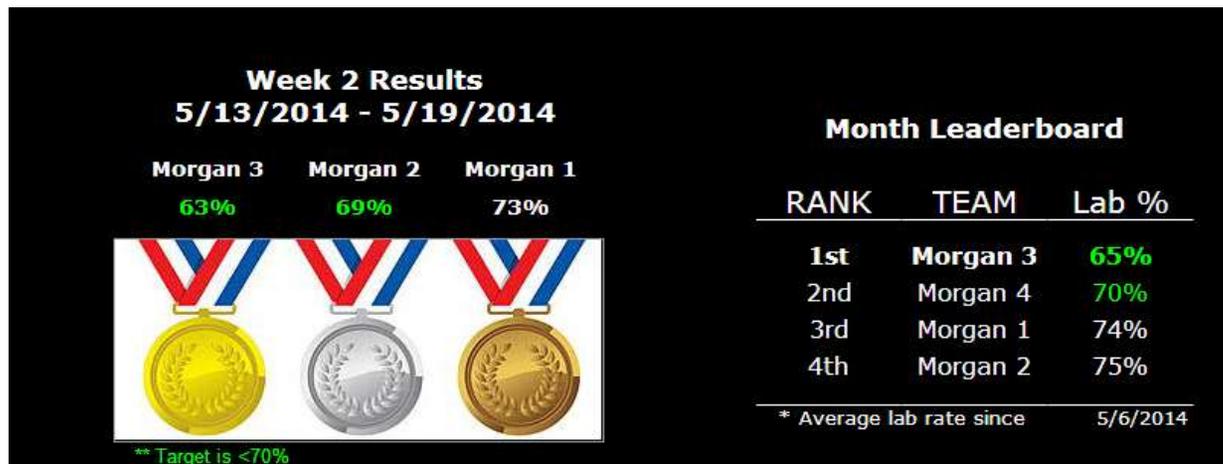
In the face of clinical and lab stability...



“I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description and perhaps I could never succeed in intelligibly doing so. But **I know it when I see it**”

Justice Potter Stewart

*[concurring opinion](#) in *Jacobellis v. Ohio* [378 U.S. 184](#) (1964),
regarding possible obscenity in [The Lovers](#)*





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Challenges



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8 Institutionalizing New Approaches

Articulating the connections between the new behaviors and corporate success
Developing the means to ensure leadership development and succession

8

7 Consolidating Improvements and Producing Still More Change

Using increased credibility to change systems, structures, and policies that don't fit the vision
Hiring, promoting, and developing employees who can implement the vision
Reinvigorating the process with new projects, themes, and change agents

7

6 Planning for and Creating Short-Term Wins

Planning for visible performance improvements
Creating those improvements
Recognizing and rewarding employees involved in the improvements

6

5 Empowering Others to Act on the Vision

Getting rid of obstacles to change
Changing systems or structures that seriously undermine the vision
Encouraging risk taking and nontraditional ideas, activities, and actions

5

4 Communicating the Vision

Using every vehicle possible to communicate the new vision and strategies
Teaching new behaviors by the example of the guiding coalition

4

3 Creating a Vision

Creating a vision to help direct the change effort
Developing strategies for achieving that vision

3

2 Forming a Powerful Guiding Coalition

Assembling a group with enough power to lead the change effort
Encouraging the group to work together as a team

2

1 Establishing a Sense of Urgency

Examining market and competitive realities
Identifying and discussing crises, potential crises, or major opportunities

1

Eight Steps to Transforming Your Organization

* John P. Kotter. Leading change: why transformation efforts fail. 1995. Harvard Business Review; OnPoint.



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Consolidating Improvements and Producing Still More Change

Using increased credibility to change systems, structures, and policies that don't fit the vision

Hiring, promoting, and developing employees who can implement the vision

Reinvigorating the process with new projects, themes, and change agents





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CBCs per patient

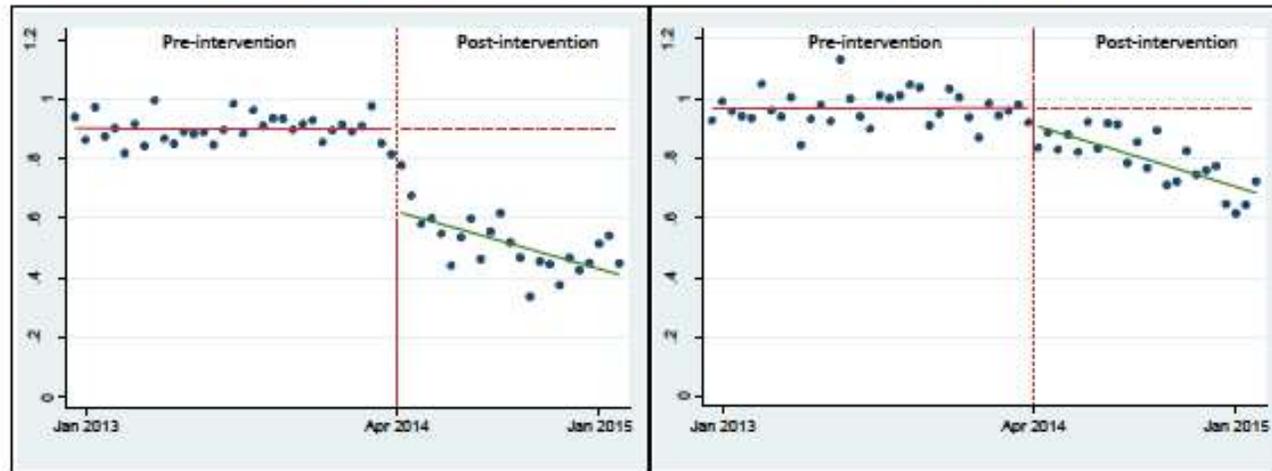


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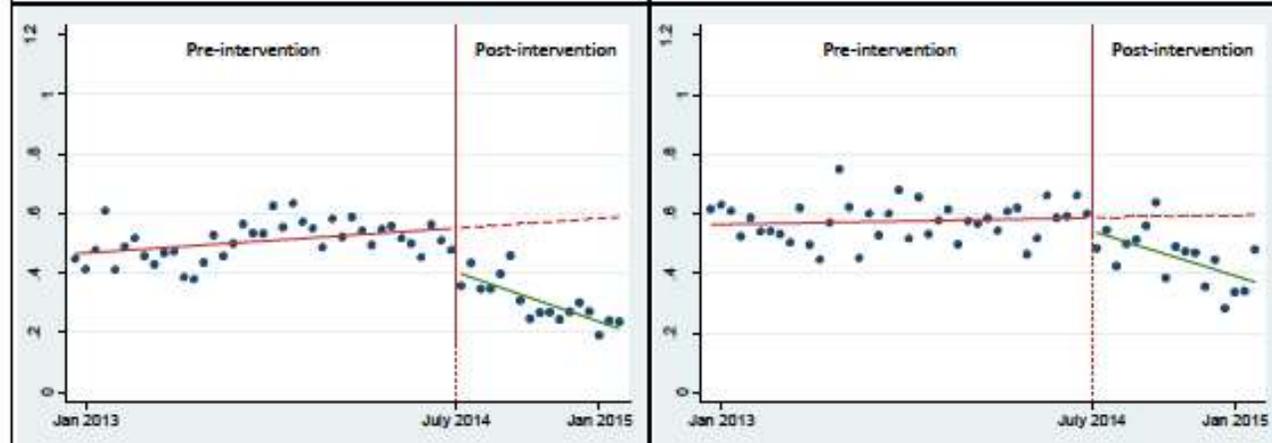
Housestaff
medical
services

Intervention

Control



Hospitalist
medical
services





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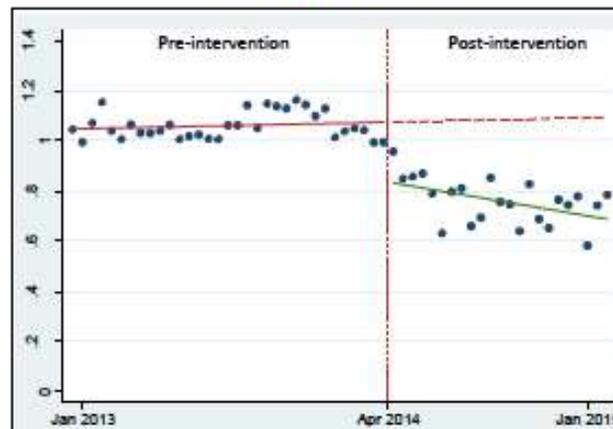
BMPs per patient



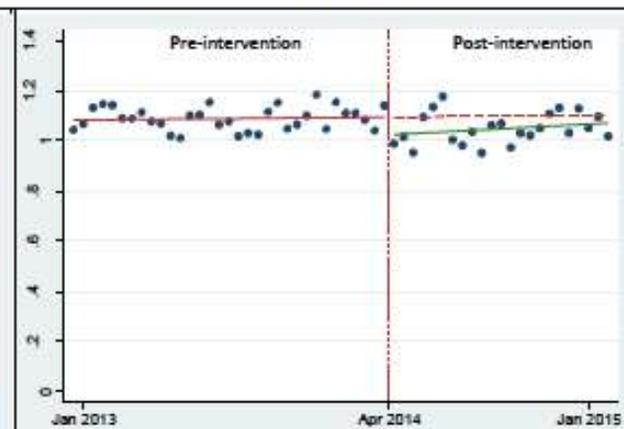
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**Housestaff
medical
services**

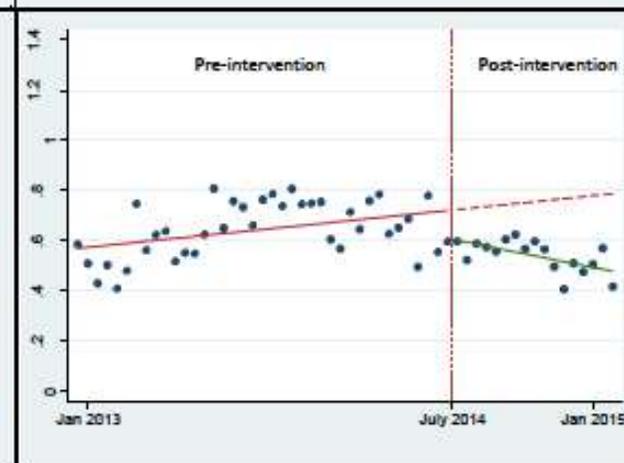
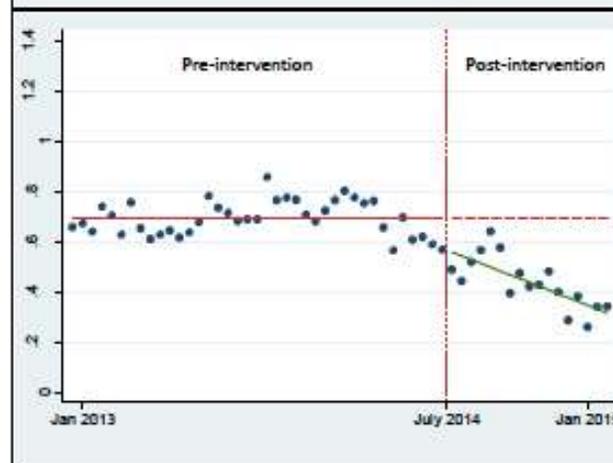
Intervention



Control



**Hospitalist
medical
services**





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Lab holidays per patient

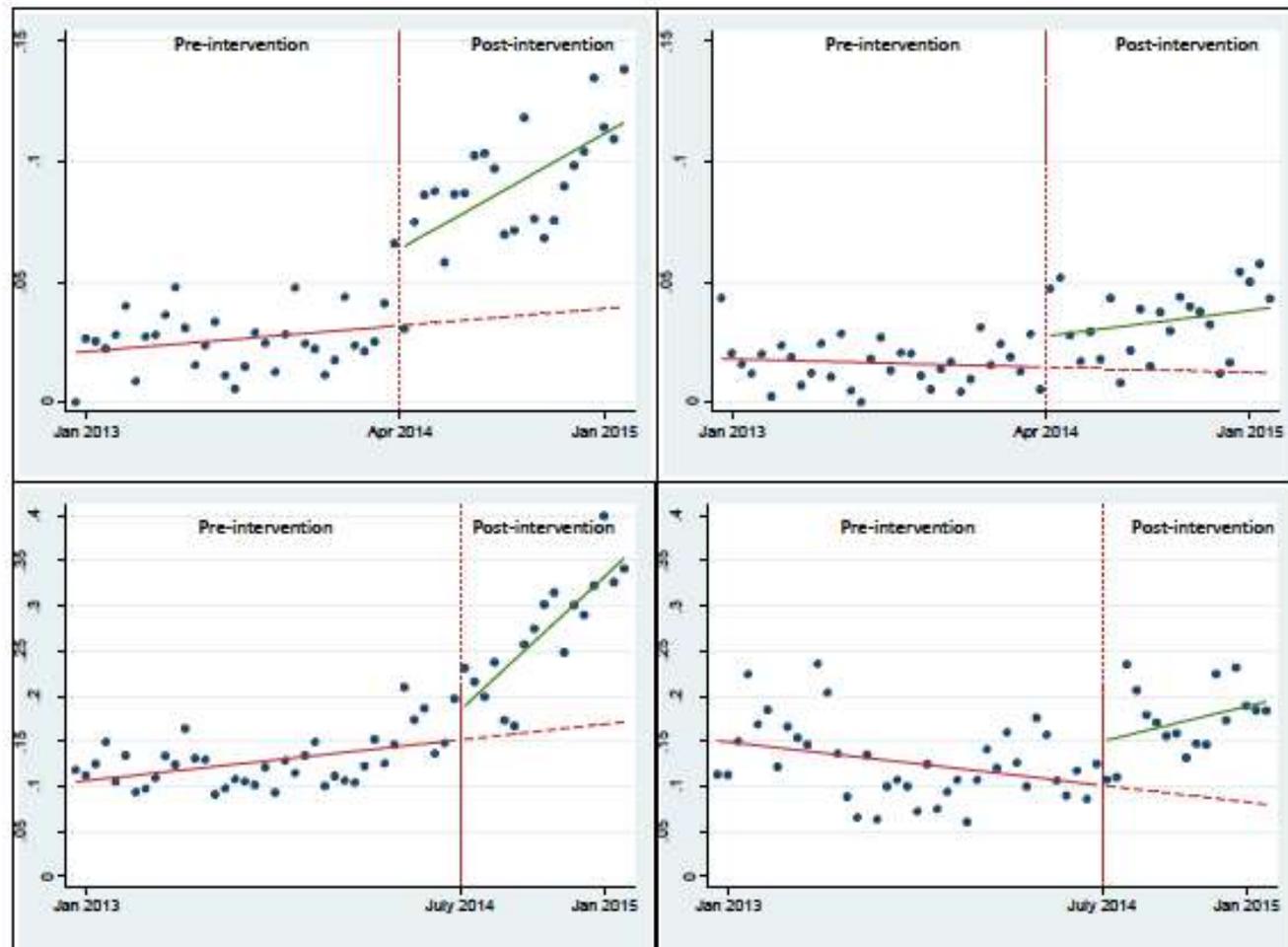


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Housestaff
medical
services

Intervention

Control



Hospitalist
medical
services



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Hospital-Wide Safety



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Hospital Length of Stay, days				
Housestaff medical services				
Intervention	5.73	5.67	-0.06	-0.17
Control	4.75	4.85	0.10	(-0.68-0.35)

ICU Transfer Rate				
Housestaff medical services				
Intervention	1.54%	1.90%	0.36%	-0.21%
Control	0.72%	1.30%	0.58%	(-1.15%-0.72%)

In-Hospital Mortality				
Housestaff medical services				
Intervention	0.16%	0.29%	0.13%	0.21%
Control	0.30%	0.22%	-0.08%	(-0.19%-0.61%)

30-day Readmission Rate				
Housestaff medical services				
Intervention	17.33%	16.33%	-1.00%	-0.38%
Control	14.73%	14.11%	-0.62%	(-4.72%-3.97%)

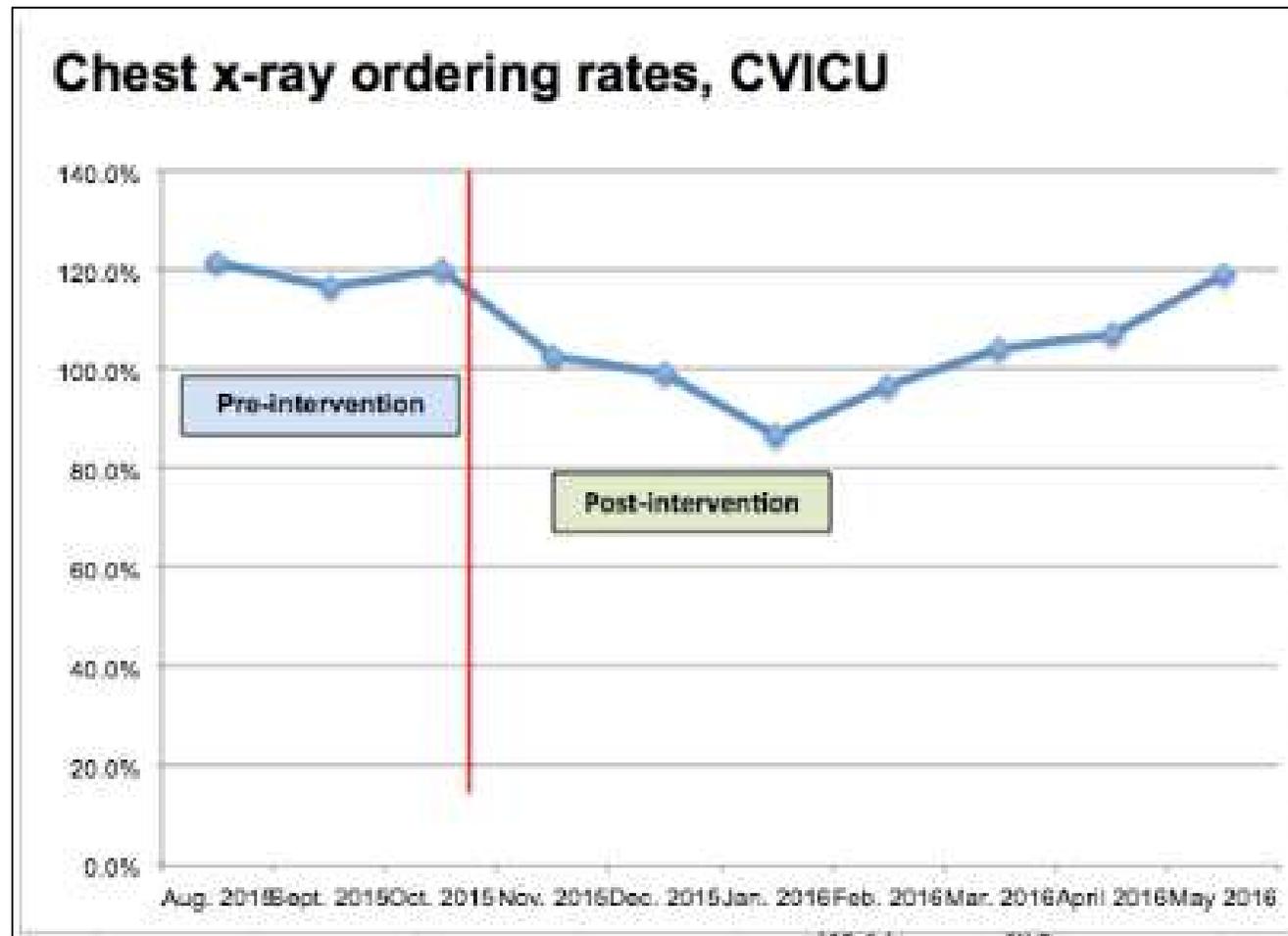


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CVICU CXR Changes



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Institutionalizing New Approaches

Articulating the connections between the new behaviors and corporate success
Developing the means to ensure leadership development and succession

8

 **Choosing
Wisely**[®]

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-
- Rapid Cycle Redesign (Chiefs of Staff)
 - Diagnostic Laboratory Advisory Committee
 - Quality Steering Council



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Challenges



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Takeaways



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What are the keys to success?



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- Motivated, identifiable local champion
- Awareness campaign
- Consistent, easily interpretable data feedback with peer comparison
- Data feedback must be personal and not judgemental
- Celebrate improvement!

- Talbot TR, Johnson JG, Fergus C, Domenico JH, Schaffner W, Daniels TL, Wilson G, Slayton J, Feistritz N, Hickson GB. Sustained improvement in hand hygiene adherence: utilized shared accountability and financial incentives. *Infect Control Hosp Epidemiol.* 2013; 34(11): 1129-1136.
- Vanderbilt University Project Bundle



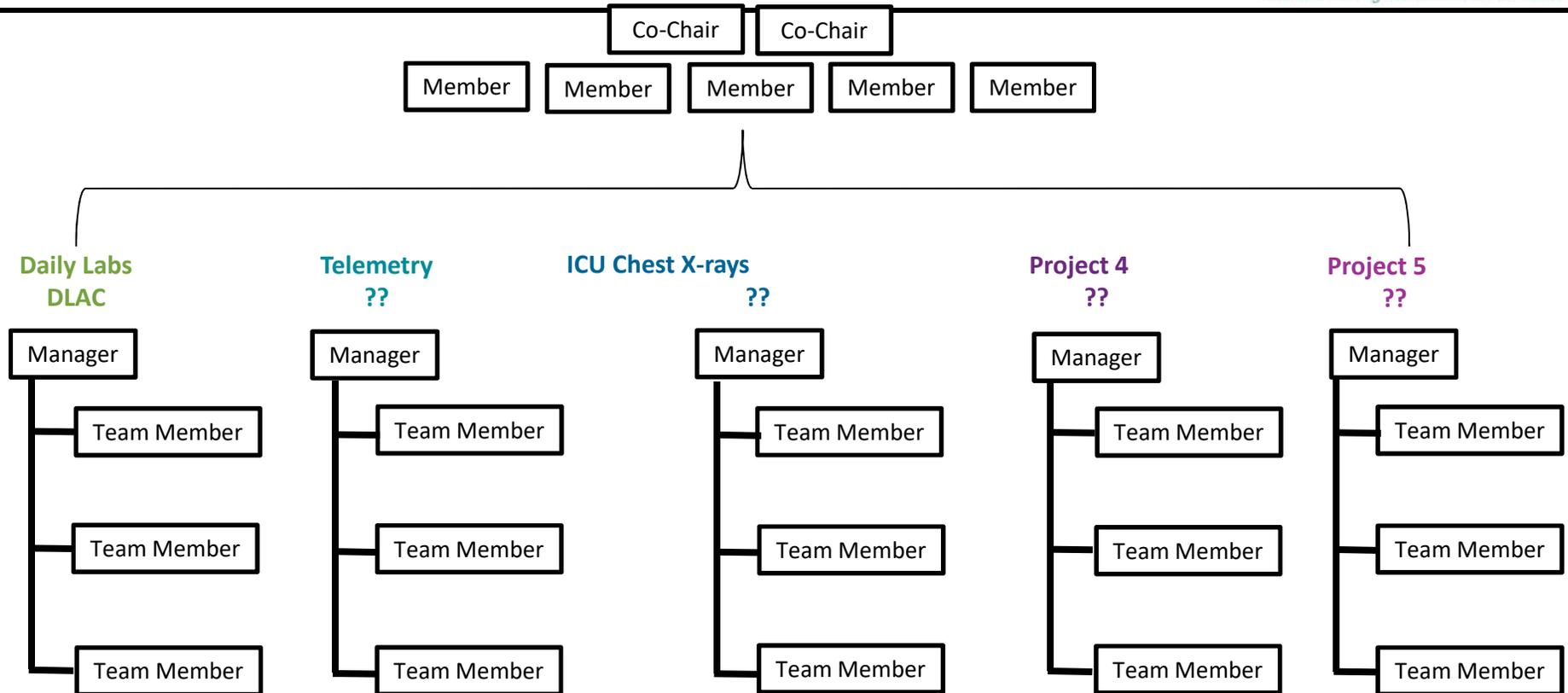
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The Choosing Wisely Committee



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National Landscape



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Current

- Teaching Value and Choosing Wisely Challenge
- Hospital-Based Value Committee - UCSF
- Providers for Responsible Ordering - Hopkins
- ACP High Value Care - Duke
- Do No Harm – U Colorado
- Inpatient autoantibody panels – MGH
- Choosing Wisely Curriculum - Stanford

Historical

- Change ordering capability (IT)
- Charge display at order entry
- Financial incentives
- Individual ordering feedback



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Patel S, Harrison JD, Valencia V, et al. The feedback bundle: a novel method of inpatient audit and feedback [abstract]. *JHM*. 2016; 11: (suppl 1).